AUDIO TO SIGN LANGUAGE TOOL

PROJECT REPORT

Submitted By

ABHAI KS

Reg. No. CCAVSCS011

for the award of the Degree of

Bachelor of Science (B.Sc.)

in Computer Science
(University of Calicut)

under the guidance of

Ms. Varsha Ganesh

Assistant Professor

BSc. COMPUTER SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE (AUTONOMOUS)
IRINJALAKUDA, KERALA
March 2024

DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE (AUTONOMOUS)
IRINJALAKUDA

CERTIFICATE

This is to certify that the project report entitled *"AUDIO TO SIGN LANGUAGE TOOL"* is a bonfied record of the project work done by **Abhai KS** in partial fulfillment of the requirement for the sixth semester of **Bachelor of Computer Science** in Department of Computer Science of **CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

Ms. Varsha Ganesh
Assistant Professor
Internal Guide

Ms. Sini Thomas
Head of Department
Computer Science

26/03/24

EXTERNAL EXAMINER

26/03/24

INTERNAL EXAMINER

DECLARATION

I hereby declare that this project work "**AUDIO TO SIGN LAN-GUAGE TOOL**" submitted to Christ College (Autonomous) Irinjalakuda, affiliated to Calicut University in partial fulfillment of the requirement for the award of the Bachelor of Computer Science, is a record of original work done by me, under the guidance of Ms. VARSHA GANESH, Department of computer Science.

Place: Irinjalakuda

ABHAI KS

ACKNOWLEDGEMENT

ABSTRACT

Audio to Sign Language Tool is introduced to address communication barriers faced by individuals who are deaf or hard of hearing by providing a web-based platform that converts spoken language into sign language animations. Leveraging technologies such as natural language processing (NLP), speech recognition, and 3D animation tools like Blender, the project facilitates communication accessibility and inclusivity for users with diverse communication needs. Through an intuitive user interface, users can input audio, view corresponding sign language animations, and provide feedback, fostering greater understanding and engagement. The project represents an innovative and impactful initiative in leveraging technology to promote communication accessibility and inclusivity for individuals with hearing impairments.

Contents

Chapter 1

1 Introduction

In recent years, there has been a growing interest in developing technologies that bridge the communication gap between individuals who are deaf or hard on hearing and those who can hear. One such technology is the Audio to Sign Language Tool, which aims to translate spoken language into sign language gestures in real-time. This innovative solution can enhance communication and facilitate effective interaction between hearing and deaf individuals. The Audio to Sign Language Tool leverages the power of machine learning and computer vision techniques to analyse spoken language and generate corresponding sign language gestures. Python, a popular programming language, provides a flexible and efficient platform for implementing this converter. By utilizing Python libraries and frameworks, we can create a robust and accurate system that can recognize and interpret spoken language and generate the appropriate sign language output. The key components of the Audio to Sign Language Converter system include: Speech Recognition, Natural Language Processing (NLP), User Interface, Lemmatization, Stop words, Tokenization, Characterization, Speech API, NLP toolkit, localhost, Hand Gestures, Sign Language

1.1 Overview

Our objective is to help people suffering from the problem of hearing. The Audio to Sign Language Tool holds great potential to improve communication accessibility for individuals with hearing impairments. By utilizing Python and its rich ecosystem of libraries and frameworks, we can develop a sophisticated and effective system that converts spoken language into sign language gestures in real-time. This technology has the potential to bridge the communication gap and enhance inclusivity for individuals who are deaf or hard of hearing in various domains, including education, healthcare, and everyday social interactions.

Chapter 2

2 System Analysis

2.1 Purpose

The main purpose of the "Audio to Sign Language Tool" website is to facilitate communication between individuals who are deaf or hard of hearing and those who can communicate verbally. The website serves as a platform where users can input audio messages, which are then converted into sign language animations. This conversion allows individuals who use sign language to understand and respond to the spoken messages effectively.

2.1.1 Existing System

Existing models for audio and text-to-sign language translation offer valuable insights into this field, although they predominantly concentrate on American Sign Language (ASL), leaving a notable gap for Indian Sign Language (ISL) solutions. These models, such as Ankita Harkude and her team's audio-to-ISL converter and Oi Mean Fang's speech-to-sign language system for Malaysians, showcase various approaches but often face limitations, including complexity and reduced accuracy. Khalid Khalil's ASL interpreter system using Sphinx 3.5 Speech Recognition and Ezhumalai P's text-to-ASL translator reveal further diversity in methodologies. Limitations of existing system: Existing sign language conversion models primarily focus on American Sign Language (ASL), which doesn't cater to the unique needs of Indian Sign Language (ISL) users.

2.1.2 Proposed System

To enhance the accessibility and understanding of deaf and hearing-impaired individuals, we plan to use animations, making the output visually appealing and interactive. This system will bridge the communication gap by providing ISL representations, addressing the specific needs of the Indian community. The workflow involves capturing audio input, converting it to text, processing it using Natural Language Processing (NLP) techniques, and generating ISL animations using Blender 3D animation tools. This approach not only offers a novel solution but also focuses on enhancing the quality of communication for the hearing-impaired. Advantages of proposed system Improved Educational Opportunities, Employment Inclusivity, Wider Information Access, Independence and Autonomy, Local Indian languanges also can be coverted. Audio file which is uploaded by the user can be also convert to ISL.

2.2 Problem definition

To know what the problem is and what the needs are before developing it. Here we design a website of Audio to sign language converter for deaf people.

2.3 Feasibility Study

After the problem is clearly understood and solutions proposed, the next step is to conduct the feasibility study. Feasibility study is defined as evaluation or analysis of the potential impact of the proposed project or program. The objective is to determine whether the proposed system is feasible. There are three aspects of feasibility study to which the proposed system is subjected as discussed below.

2.3.1 Technical Feasibility

Technical feasibility assess whether the current technical resources are sufficient for the new system. We can upgrade the level of technology for supporting our website. We check whether the proposed system can be implemented in the present system without supporting the existing hardware.

2.3.2 Economical Feasibility

Economic feasibility determines whether the time and money are available to develop the system. There is no additional hardware used to develop the site, it is inexpensive to build.

2.3.3 Operational Feasibility

Operational feasibility determines if the human resources are available to operate the system once it has been installed. No extra training is needed to use this system. Anyone who has knowledge in internet in english language can easily use the system. The resources that are required to implement or install are already available with the organization.

Chapter 3

3 Software Requirement Specification

3.1 Purpose

The purpose of this document is to give a detailed description of the requirements for the AUDIO TO SIGNLANGUAGE TOOL. It illustrate the purpose and complete description for the development of the system. It explain system constraints, interface and interactions with other external applications. This document is primarily intended to be proposed for normal people to bridge the communication gap between the deaf people.

3.2 Scope

Our project has made it easier for normal people to communicate with deaf people easily and systematically. This encompasses the development of a versatile language conversion system that supports English, Malayalam, and Hindi languages initially, with provisions for future expansion to include more languages. Future directions may include expanding language support, enhancing user customization options, and integrating feedback mechanisms for continuous improvement. Sign language translator can be used in schools, colleges, hospitals, universities, airports, courts. Anywhere anyone can use this system for understanding the sign language to communicate. The future work is to develop an application where in the news channels can use it while giving news, in one corner of the screen it will be displayed in sign language for deaf people.

3.3 Overall Description

This section give an overview of our website, AUDIO TO SIGNLANGUAGE TOOL. This project is designed for deaf people. This system enables users to register and login to the system. It also enables the users to speech and view the corresponding Sign Language generation. The user can speech through either Hindi, English or Malayalam.

3.3.1 Product Perspective

AUDIO TO SIGNLANGUAGE TOOL is mainly used for effective communication between normal people and deaf people. The users can speech or text and corresponding SignLanguage will be generated by animation. The users can also upload the audio files which can also be converted.

3.3.2 Product Functionality

Through this system users can register and login to the system. Users can speech, text or upload the audio files which are needed to be converted. Users are

FOREST FIRE DETECTION

PROJECT REPORT

Submitted By

DEVIKA SHAJI

Reg. No. CCAVSCS012

for the award of the Degree of

Bachelor of Science (B.Sc.)

in Computer Science
(University of Calicut)

under the guidance of

Ms. Priyanga K K

Assistant Professor

BSc. COMPUTER SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE(Autonomous)
IRINJALAKUDA, KERALA
INDIA
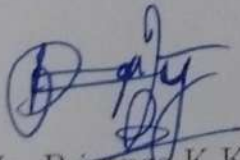
March 2024

DEPARTMENT OF COMPUTER SCIENCE

CHRIST COLLEGE (AUTONOMOUS)

IRINJALAKUDA

CERTIFICATE
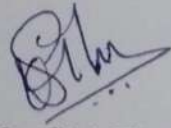
This is to certify that the project report entitled **"FOREST FIRE DE-TECTION"** *is a bonfied record of the project work done by* **Devika Shaji** *in partial fulfillment of the requirement for the sixth semester of* **Bachelor of Computer Science** *in Department of Computer Science of* **CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

Ms. Priyanga K K
Assistant Professor,CS
Internal Guide

Ms. Sini Thomas
Head of the Department
Computer Science

25/3/2024

EXTERNAL EXAMINER

INTERNAL EXAMINER

DECLARATION

I hereby declare that this project work "**FOREST FIRE DETEC-TION**" submitted to Christ College (Autonomous) Irinjalakuda, affiliated to Calicut University in partial fulfillment of the requirement for the award of the Bachelor of Computer Science, is a record of original work done by me, under the guidance of Ms.PRIYANGA K K, Department of computer Science.

Place: Irinjalakuda   DEVIKA SHAJI

ACKNOWLEDGEMENT

First and foremost I like to thank Lord almighty for his providence and for being the guiding light throughout the project. I wish to express my sincere gratitude to my beloved Department head for giving me all the facilities for my project. I take this opportunity to express my gratitude to the class teacher Ms.RASMI P M and head of the department Ms.SINI THOMAS who has been supported us throughout the course of this project. I am thankful for her aspiring guidance and valuable advice during the project work. I express my sincere thanks to my project guide Ms.PRIYANGA K K for supporting and guiding throughout the project.I would take this opportunity to specially thank all other faculty members for their constant and continuous motivation. Finally I would like to thank my family and friends for giving valuable advice and moral support throughout my project.

ABSTRACT

In contemporary applications, the imperative nature of effective fire detection is evident in ensuring the safety and security of diverse domains such as video surveillance and safety infrastructure. This project introduces an innovative hybrid approach that seamlessly integrates the interpretability of traditional machine learning models with the intricate feature extraction capabilities of deep learning, aiming to achieve a nuanced and high-performance fire detection system. By combining the strengths of both paradigms, the proposed approach addresses the complexities inherent in fire detection tasks

Contents

Chapter 1

1   Introduction

Fire incidents pose significant threats to individuals, communities, and the environment. The severity of these threats can vary depending on the nature of the fire, its location, and the response capabilities in place.The ability to detect fires in videos has emerged as a critical imperative for facilitating early intervention and effective mitigation strategies. This project serves as a vanguard, introducing an innovative and technologically advanced approach to fire detection in videos and images through the application of machine learning techniques and deep learning techniques. In the realm of video surveillance, the ubiquity of camera systems has soared, making it increasingly imperative to harness these systems to bolster the rapidity and efficacy of fire detection. The motivation behind this research stems from the recognition that conventional fire detection methods often fall short in swiftly identifying emerging fire threats. Leveraging video data offers a unique opportunity to address this pressing issue, as it can provide a visual stream of information that can be analysed in real-time. However, the endeavour of fire detection in video data is not without its multifaceted challenges. Videos are inherently dynamic and complex, replete with intricate visual details and often significant variations in lighting, weather conditions, and perspectives. Distinguishing between normal activities and the onset of a fire event can be a formidable task. .

1.1   Overview

Additionally, the stakes are exceptionally high in fire detection, as delayed or inaccurate detection can lead to catastrophic consequences, including loss of life, extensive property damage, and environmental degradation. To address these formidable challenges, this research embarks on a pioneering journey into the realm of machine learning. Machine learning, a subfield of artificial intelligence, offers the promise of automating the process of fire detection in videos, potentially revolutionizing the field of fire safety. By training machine learning models to recognize the distinctive visual patterns associated with fires, it becomes possible to create an efficient and accurate fire detection system. The primary objective of this research is crystal clear: to develop a fire detection system for videos that is not only efficient but also highly accurate. Such a system could serve as an invaluable tool for public safety, as it has the potential to drastically reduce response times when fires break out. The importance of early fire detection cannot be overstated, as it can mean the difference between containing a fire in its nascent stage and grappling with an uncontrolled inferno. As we delve deeper into the subsequent sections of this paper, we will unravel the intricate steps and methodologies involved in achieving this ambitious objective. We will explore the nuances of data collection, highlighting the importance of

creating a diverse dataset of videos containing both fire and non-fire scenarios. We will delve into the intricacies of data preprocessing, which involves tasks such as frame extraction, feature extraction, and data format conversion, all of which are essential for rendering video data amenable to machine learning analysis. The core of our approach revolves around the design and training of a machine learning model, such as a convolutional neural network (CNN) or recurrent neural network (RNN), tailored explicitly for fire detection. These models will be endowed with the ability to sift through vast streams of video data in real-time, distinguishing between benign scenes and the critical emergence of a fire.

Chapter 2

2 System Analysis

2.1 Purpose

The overarching purpose of the Fire Detection project lies in addressing the imperative need for an advanced, automated system capable of real-time fire detection. This purpose emerges from the recognition of the limitations within the existing manual fire detection processes and aims to harness the synergy of Convolutional Neural Networks (CNN)and understand the specific needs and objectives of stakeholders, including government agencies, environmental organizations, and communities, regarding forest fire detection and management.

2.1.1 Existing System

- Machine Learning models are created to detect fire.

- Randomforest and knn models are created.

- Training Data:The training data is loaded using the ImageDataGenerator from the Keras library.

- The training data is organized in two directories: one for training and validation (Training and Validation), and another for testing (Testing).

- The script assumes a binary classification task with classes labeled as 0 (No Fire) and 1 (Fire).

- Model Training:Two classifiers are used: Random Forest and k-Nearest Neighbors (KNN).

- The classifiers are trained on flattened images obtained from the training dataset.

- Trained models are saved using joblib.

2.1.2 Proposed System

- Forest fire Detection is done using Convolutional Neural Network (CNN) using the TensorFlow and Keras libraries. Here's an overview of the key components:

- Data Preparation:Image data is loaded using ImageDataGenerator from directories containing training and testing images.

- The images are resized to (150, 150) pixels and normalized by rescaling pixel values to the range [0, 1].

- CNN Model Architecture: A sequential model is created with the following layers:

- Convolutional layer with 32 filters, kernel size (3,3), and ReLU activation.

- MaxPooling layer with a pool size of (2,2).

- Additional convolutional and max-pooling layers to capture hierarchical features.

- Flattening layer to convert the 2D feature maps to a 1D vector.

- Fully connected Dense layer with 512 units and ReLU activation.

- Output layer with a single neuron and sigmoid activation for binary classification.

2.2 Problem definition

The existing manual processes for fire detection present a myriad of challenges that underscore the critical need for a technological solution. The key issues identified in the current system include:

- Time Inefficiency: The reliance on manual inspection for fire detection introduces a significant time lag in identifying potential threats. Human operators must painstakingly review images and videos, leading to delays that could prove detrimental in emergency situations. The inefficiency of the manual process underscores the necessity for an automated system that can rapidly analyse and respond to fire-related incidents.

- Potential for Delayed Response: The manual nature of the existing system increases the risk of delayed responses during critical situations. The time taken to visually inspect each image or video introduces a variable that could impact the effectiveness of emergency response measures. A delayed response poses a serious threat to both property and lives, emphasizing the need for a more prompt and automated fire detection system.

- Human Reliance and Oversight: Relying solely on human intervention for fire detection introduces the inherent risk of oversight or errors. Human operators may miss subtle signs of fire, leading to false negatives or delayed detections. The potential for oversight in a manual system compromises the reliability and accuracy of fire safety measures, necessitating a more robust and foolproof solution.

- Lack of Integration of Advanced Technologies: The absence of a dedicated system that integrates advanced image processing and machine learning exacerbates the challenges in the existing fire detection process. The manual approach lacks the capability to harness the potential of technologies like Convolutional Neural Networks (CNNs) for efficient feature extraction and pattern recognition. This technological gap underscores the need

FOREST FIRE DETECTION

PROJECT REPORT

Submitted By

JEEVAN DOMINIC

Reg. No. CCAVSCS013

for the award of the Degree of

Bachelor of Science (B.Sc.)

in Computer Science
(University of Calicut)

under the guidance of

Ms. Priyanga K K

Assistant Professor

BSc. COMPUTER SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE(Autonomous)
IRINJALAKUDA, KERALA
INDIA

March 2024

DEPARTMENT OF COMPUTER SCIENCE

CHRIST COLLEGE (AUTONOMOUS)

IRINJALAKUDA

CERTIFICATE

This is to certify that the project report entitled **"FOREST FIRE DE-TECTION"** is a bonfied record of the project work done by **Jeevan Dominic** in partial fulfillment of the requirement for the sixth semester of **Bachelor of Computer Science** in Department of Computer Science of **CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

Ms. Priyanga K K
Assistant Professor,CS
Internal Guide

Ms. Sini Thomas
Head of the Department
Computer Science

25/03/2024

EXTERNAL EXAMINER

INTERNAL EXAMINER

DECLARATION

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Place: Irinjalakuda   JEEVAN DOMINIC

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WITH YOU
MENTAL HEALTH TRACKER

PROJECT REPORT

Submitted By

KRISHNA SURYAMSH T S

Reg. No. CCAVSCS014

for the award of the Degree of

Bachelor of Science (B.Sc.)

in Computer Science
(University of Calicut)

under the guidance of

Ms. Rasmi P M

Assistant Professor

BSc. COMPUTER SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE(Autonomous)
IRINJALAKUDA, KERALA
INDIA

March 2024

DEPARTMENT OF COMPUTER SCIENCE

CHRIST COLLEGE (AUTONOMOUS)

IRINJALAKUDA

CERTIFICATE

This is to certify that the project report entitled *"With You - Mental Health Tracker"* is a bonfied record of the project work done by **Krishna Suryamsh T S** in partial fulfillment of the requirement for the sixth semester of **Bachelor of Computer Science** in Department of Computer Science of **CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA.**

Ms. Rasmi P M
Assistant Professor, CS
Internal Guide

Ms. Sini Thomas
Head of the Department
Computer Science

26/03/2024

EXTERNAL EXAMINER

INTERNAL EXAMINER

DECLARATION

I hereby declare that this project work "WITH YOU - MENTAL HEALTH TRACKER" submitted to Christ College (Autonomous) Irinjalakuda, affiliated to Calicut University in partial fulfillment of the requirement for the award of the Bachelor of Computer Science, is a record of original work done by us, under the guidance of Ms. RASMI P M, Department of Computer Science.

Place: Irinjalakuda

KRISHNA SURYAMSH T S

ACKNOWLEDGEMENT

First and foremost I like to thank Lord almighty for his providence and for being the guiding light throughout the project. I wish to express my sincere gratitude to my beloved Department head for giving me all the facilities for my project. I take this opportunity to express my gratitude to the class teacher Ms. RASMI P M, our scholar hub guide Ms. PRIYANGA K K and head of the department Ms. SINI THOMAS who has been supported me throughout the course of this project.I am thankful for her aspiring guidance and valuable advice during the project work. I express my sincere thanks to my project guide Ms. RASMI P M for supporting and guiding throughout the project.I would take this opportunity to specially thank all other faculty members for their constant and continuous motivation. Finally I would like to thank my family and friends for giving valuable advice and moral support throughout my project.

ABSTRACT

MENTAL HEALTH TRACKER APP application aims to empower users to monitor their mental health status, track mood fluctuations, identify potential triggers, and access resources for support. Key features include mood tracking, and personalized recommendations based on user input and behavioral patterns. Utilizing data analytics and machine learning algorithms, the application will offer insights into users' mental health trends over time, enabling them to make informed decisions regarding self-care and seek professional help if needed.

Contents

Chapter 1

1 Introduction

Welcome to our project on mental health tracking! In an increasingly digitized world, our focus turns to leveraging technology for mental well-being. Our app aims to provide a holistic approach to mental health monitoring, offering users a user-friendly interface to track their emotional states, access resources, and cultivate healthier habits. Join us on this journey to promote mental wellness through innovation.

1.1 Overview

Our project aims to bridge the gap between technology and mental well-being. At its core, our project revolves around the development of a comprehensive mental health tracker app. This app serves as a multifaceted tool designed to empower users in various aspects of their mental wellness journey. our goal is to harness the power of computer science to create a positive impact on mental health outcomes. By empowering individuals to take proactive steps towards better mental well-being, we strive to contribute to a healthier and more resilient society.

Chapter 2

2 System Analysis

2.1 Purpose

A mental health tracker app developed through a computer science project serves to provide users with tools to monitor and manage their mental well-being. It can include features like mood tracking, journaling, coping strategies, and resources for support. The app aims to promote mental health awareness, offer insights into patterns and triggers, and encourage users to seek professional help when needed.

2.1.1 Existing System

The existing system of a mental health tracker app typically involves features like mood tracking and sometimes reminders for medication or therapy session. Users can log their emotions, and thoughts to gain insights into their mental well-being over time. Some apps also offer resources like coping strategies, relaxation techniques, and mental health assessments. The data collected can be used to identify patterns, triggers, and progress in managing mental health.

2.1.2 Proposed System

The proposed system is an android application that tracks the mental health of a person. This app will help to the patient to improve their mental condition and encourages them to enjoy life and helps them to stay always positive. In this model aims to identify, analyse and characterize the current state of person. The application was created based on interaction between patient and the smart device to connect with psychologist. In this model, mental screening questionnaires includes sentiment analysis which are there for tracking mood and mental condition more precisely. This model helps rationalize negative thoughts.

2.2 Problem definition

In an era where mental health awareness is paramount, there exists a need for accessible, user-friendly, and effective tools to support individuals in monitoring and managing their mental well-being. The problem at hand is to comprehensively investigate and evaluate mental health tracker apps to determine their effectiveness in enhancing users' mental well-being, identify key features and design considerations that contribute to their usability and engagement, and explore their potential role in augmenting traditional mental healthcare delivery models.

2.3 Feasibility study

After the problem is clearly understood and solutions proposed, the next step is to conduct the feasibility study. Feasibility study is defined as evaluation or analysis of the potential impact of the proposed project or program. The objective is to determine whether the proposed system is feasible. There are three aspects of feasibility study to which the proposed system is subjected as discussed below.

2.3.1 Technical Feasibility

Technical feasibility assess whether the current technical resources are sufficient for the new system. We can upgrade the level of technology for supporting our website. We check whether the proposed system can be implemented in the present system without supporting the existing hardware.

2.3.2 Economical Feasibility

Economic feasibility determines whether the time and money are available to develop the system. There is no additional hardware used to develop the site, it is inexpensive to build.

2.3.3 Operational Feasibility

Operational feasibility determines if the human resources are available to operate the system once it has been installed. No extra training is needed to use this system. Anyone who has knowledge in internet in english language can easily use the system. The resources that are required to implement or install are already available with the organization.

Chapter 3

3 Software Requirement Specification

3.1 Purpose

The purpose of this document is to give a detailed description of the Requirements or the MENTAL HEALTH TRACKER APPLICATION . It illustrate the purpose and complete description for the development of the system. It explain system constraints, interface and interactions with other external applications. This document is primarily intended to help users monitor and manage their mental well being.

3.2 Scope

The scope of a Mental Health Tracker app encompasses various features and functionalities aimed at promoting self-awareness, supporting mental health management, and fostering well-being.

3.3 Overall Description

This section give an overview of our application, mental health tracker application. A mental health tracker app is a digital tool designed to help users monitor, manage, and improve their mental well-being. It typically offers a range of features and functionalities to support users in understanding and addressing their mental health concerns.

3.3.1 Product Perspective

A successful Mental Health Tracker app combines user-centric design principles, robust features, data privacy measures, interoperability, continuous improvement, and effective business strategies to deliver value to users and contribute to their mental well-being.

3.3.2 Product Functionality

The functionality of a Mental Health Tracker app is crucial in providing users with tools and features to monitor, manage, and improve their mental well-being.

3.3.3 Users and Characteristics

Mental Health Tracker app users encompass a diverse range of individuals, including those managing diagnosed conditions, seeking self-improvement, supporting others, or prioritizing holistic well-being. Psychological Experts can access the app and diagnose the users who are using the app.

INTERVIEW CONFIDENCE LEVEL ANALYZER

PROJECT REPORT

Submitted By

KRISHNAPRIYA T P

Reg. No. CCAVSCS015

for the award of the Degree of

Bachelor of Science (B.Sc.)

in Computer Science
(University of Calicut)

under the guidance of

Ms. Soumya P S

Assistant Professor

BSc. COMPUTER SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE(Autonomous)
IRINJALAKUDA, KERALA
INDIA

March 2024

CERTIFICATE

This is to certify that the project report entitled *"Interview confidence level analyser"* is a bonafide record of the project work done by **Krishnapriya T.P** in partial fulfillment of the requirement for the sixth semester of *Bachelor of Computer Science* in Department of Computer Science of *CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA*

Ms. Soumya P S
Assistant Professor,CS
Internal Guide

Ms. Sini Thomas
Head of the Department
Computer Science

EXTERNAL EXAMINER

INTERNAL EXAMINER

DECLARATION

I hereby declare that this project work "INTERVIEW CONFIDENCE LEVEL ANALYSER" submitted to Christ College (Autonomous) Irinjalakuda, affiliated to Calicut University in partial fulfillment of the requirement for the award of the Bachelor of Computer Science, is a record of original work done by me, under the guidance of Ms. SOUMYA P S, Department of computer Science.

Place: Irinjalakuda   KRISHNAPRIYA T P

ACKNOWLEDGEMENT

First and foremost I like to thank Lord almighty for his providence and for being the guiding light throughout the project. I wish to express my sincere gratitude to our beloved Department head for giving me all the facilities for our project. I take this opportunity to express my gratitude to the class teacher Ms. RASMI P M and head of the department Ms. SINI THOMAS who has been supported me throughout the course of this project. I am thankful for her aspiring guidance and valuable advice during the project work. I express my sincere thanks to my project guide Ms. SOUMYA P.S for supporting and guiding throughout the project.I would take this opportunity to specially thank all other faculty members for their constant and continuous motivation. Finally I would like to thank my family and friends for giving valuable advice and moral support throughout our project.

ABSTRACT

INTERVIEW CONFIDENCE LEVEL ANALYSER is a web application that uses advanced technologies to assess interviewee confidence during video interviews. It uses computer vision techniques to capture real-time video data, including facial landmark detection, to predict interviewee confidence levels. The system's user interface is intuitive and user-friendly, allowing interviewers to customize confidence level thresholds. Real-time feedback is displayed throughout the interview, aiding decision-making and adaptability. The application is designed with ethical considerations in mind, including user authentication, informed consent, and privacy protection. The technology stack ensures scalability, flexibility, and compatibility with various deployment platforms. The application aims to modernize interview assessments, providing valuable insights to improve the hiring process.

Contents

Chapter 1

1   Introduction

The project aims to revolutionize interview evaluation by utilizing computer vision and machine learning to analyse the confidence levels of interviewees through a webcam-based system. The human face is a rich source of non-verbal cues, and movements of the eyes and head can indicate an individual's confidence level during an interview. By leveraging webcam technology, the project aims to capture and interpret these subtle cues in real-time, providing a comprehensive and objective assessment of an interviewee's confidence throughout the interview process.

The methodology involves facial landmark detection algorithms to precisely track the movements of key facial features, such as the eyes and nose. By analysing parameters like blink rate, gaze direction, and head tilt, a machine learning model can be developed capable of discerning patterns associated with varying confidence levels.

This project not only refines the interview assessment process but also addresses the limitations of traditional subjective evaluations. The real-time nature of the approach enables immediate feedback, allowing interviewers to adapt their strategies and create a more conducive environment for candidates. Ethical considerations surrounding the use of personal data and privacy and consent are paramount in the methodology.

1.1   Overview

Machine learning is being used in video interviews to analyse and quantify interviewee confidence levels. By tracking facial landmarks, the system extracts key features like gaze direction, and head tilt. This real-time feedback allows interviewers to adapt their strategies based on objective data. Ethical considerations, informed consent, and privacy protection are integral to the methodology, contributing to the evolution of interview assessment practices. There is a registration and login page. Visual representation of analysis as pie chart and graph are the features we provide. Tips and guidance is also provided.

Chapter 2

2 System Analysis

2.1 Purpose

The ability to assess an interviewee's confidence level is crucial in various do-
mains, including job interviews, psychological evaluations, and public speaking
engagements. Traditional methods of gauging confidence often rely on subjec-
tive judgments or self-reporting, which can be unreliable. This project proposes
a novel approach to assess confidence levels by analysing eye movements and
facial expressions captured through a webcam during interviews. By employing
computer vision and machine learning techniques, this system aims to provide
objective and real-time feedback on the interviewee's confidence, enabling more
informed decision-making by interviewers. The project involves the develop-
ment of algorithms for detecting and interpreting relevant facial cues and eye
movements indicative of confidence levels, followed by the implementation of a
user-friendly interface for interaction. The effectiveness of the system will be
evaluated through experimental studies, comparing its assessments with human
judgments and self-reported confidence levels. The outcomes of this project
have the potential to enhance interview processes, improve interviewer training,
and contribute to advancements in human-computer interaction and affective
computing.

2.1.1 Proposed System

The proposed system aims to revolutionize the interview process by introducing
a real-time confidence level testing mechanism. Leveraging the capabilities of
webcam technology, the system analyses interviewee's eye movements and facial
expressions to gauge their confidence levels during the interview. Based on
the analysis of facial expressions and eye movements, the system will assign a
confidence score to the interviewee, indicating their level of confidence during
the interview. The results of the confidence level assessment will be presented
visually using bar charts and pie charts. Bar charts can display the distribution
of confidence levels among interviewees, while pie charts can show the proportion
of different confidence levels.

2.2 Problem definition

To know what the problem is and what the needs are before developing it.

2.3 Feasibility Study

A feasibility study for a project involving the testing of interviewees using a we-
bcam to detect eye movements and facial expressions would typically assess the

viability and practicality of such a venture. Testing interviewees using webcam technology to analyse eye movements and facial expressions.

2.3.1 Technical Feasibility

Assessing the availability and reliability of eye tracking and facial expression detection technologies. This may involve researching existing algorithms and software libraries for analyzing eye movements and facial expressions

2.3.2 Economical Feasibility

Estimating the development costs for creating the software or system required for the project. This would include factors such as software development, hardware acquisition, and ongoing maintenance costs. Potential revenue streams could come from offering the system as a service to organizations conducting interviews or through licensing fees.

2.3.3 Operational Feasibility

Conducting user acceptance testing with interviewers to ensure that the system provides accurate results. Training programs may be required to familiarize users with the system and its capabilities. Integration with existing interview processes and workflows would also need to be considered to ensure seamless adoption of the technology.

Chapter 3

3 Software Requirement Specification

3.1 Purpose

The Software Requirements document outlines the functional and non-functional requirements of the "Interview Confidence Level Analyzer" project. It serves as a blueprint for the development team, ensuring a clear understanding of the system's objectives, features, and constraints.

3.2 Scope

The software is designed to analyse interviewee confidence levels during video interviews using computer vision and machine learning techniques. The scope includes real-time feedback provision to interviewers based on facial landmarks, eye movement, and head posture analysis.

3.3 Overall Description

The "Interview Confidence Level Analyzer" is an innovative software system designed to revolutionize the assessment process of interviewee confidence during video interviews. This section provides an overview of the project's perspective, functionality, users and characteristics.

3.3.1 Product Perspective

The "Interview Confidence Level Analyzer" is positioned as a standalone software system designed to operate seamlessly within the context of video interviews. It serves as an innovative addition to traditional interview assessment methods by introducing real-time confidence level analysis through computer vision and machine learning technologies.

3.3.2 Product Functionality

The "Interview Confidence Level Analyzer" is rich in features aimed at providing a comprehensive and objective analysis of interviewee confidence levels as visual representation.

3.3.3 Users and Characteristics

There are two types of users that interact with the webpage are interviewers and interviewees. The users can analyse their confidence level which will be represented as pie chart and bar chart.

INTERVIEW CONFIDENCE LEVEL ANALYZER

PROJECT REPORT

Submitted By

MOHAMMED FARIS

Reg. No. CCAVSCS016

for the award of the Degree of

Bachelor of Science (B.Sc.)

in Computer Science
(University of Calicut)

under the guidance of

Ms. Soumya P S

Assistant Professor

BSc. COMPUTER SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE(Autonomous)
IRINJALAKUDA, KERALA
INDIA

March 2024

DEPARTMENT OF COMPUTER SCIENCE

CHRIST COLLEGE (AUTONOMOUS)

IRINJALAKUDA
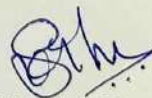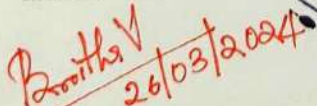
CERTIFICATE

This is to certify that the project report entitled *"Interview confidence level analyser"* is a bonafide record of the project work done by **Mohammed Faris** in partial fulfillment of the requirement for the sixth semester of **Bachelor of Computer Science** in Department of Computer Science of **CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

Ms. Soumya P S
Assistant Professor,CS
Internal Guide

Ms. Sini Thomas
Head of the Department
Computer Science

EXTERNAL EXAMINER

26/03/2024

INTERNAL EXAMINER

26/03/24

DECLARATION

I hereby declare that this project work **"INTERVIEW CONFIDENCE LEVEL ANALYSER"** submitted to Christ College (Autonomous) Irinjalakuda, affiliated to Calicut University in partial fulfillment of the requirement for the award of the Bachelor of Computer Science, is a record of original work done by me, under the guidance of Ms. SOUMYA P S, Department of computer Science.

Place: Irinjalakuda   MOHAMMED FARIS

ACKNOWLEDGEMENT

ABSTRACT

INTERVIEW CONFIDENCE LEVEL ANALYSER is a web application that uses advanced technologies to assess interviewee confidence during video interviews. *It uses computer vision techniques to capture real-time video data*, including facial landmark detection, to predict interviewee confidence levels. The system's user interface is intuitive and user-friendly, allowing interviewers to customize confidence level thresholds. Real-time feedback is displayed throughout the interview, aiding decision-making and adaptability. The application is designed with ethical considerations in mind, including user authentication, informed consent, and privacy protection. The technology stack ensures scalability, flexibility, and compatibility with various deployment platforms. The application aims to modernize interview assessments, providing valuable insights to improve the hiring process.

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Chapter 1

1 Introduction

The project aims to revolutionize interview evaluation by utilizing computer vision and machine learning to analyse the confidence levels of interviewees through a webcam-based system. The human face is a rich source of non-verbal cues, and movements of the eyes and head can indicate an individual's confidence level during an interview. By leveraging webcam technology, the project aims to capture and interpret these subtle cues in real-time, providing a comprehensive and objective assessment of an interviewee's confidence throughout the interview process.

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Machine learning is being used in video interviews to analyse and quantify interviewee confidence levels. By tracking facial landmarks, the system extracts key features like gaze direction, and head tilt. This real-time feedback allows interviewers to adapt their strategies based on objective data. Ethical considerations, informed consent, and privacy protection are integral to the methodology, contributing to the evolution of interview assessment practices. There is a registration and login page. Visual representation of analysis as pie chart and graph are the features we provide. Tips and guidance is also provided.

Chapter 2

2 System Analysis

2.1 Purpose

The ability to assess an interviewee's confidence level is crucial in various domains, including job interviews, psychological evaluations, and public speaking engagements. Traditional methods of gauging confidence often rely on subjective judgments or self-reporting, which can be unreliable. This project proposes a novel approach to assess confidence levels by analysing eye movements and facial expressions captured through a webcam during interviews. By employing computer vision and machine learning techniques, this system aims to provide objective and real-time feedback on the interviewee's confidence, enabling more informed decision-making by interviewers. The project involves the development of algorithms for detecting and interpreting relevant facial cues and eye movements indicative of confidence levels, followed by the implementation of a user-friendly interface for interaction. The effectiveness of the system will be evaluated through experimental studies, comparing its assessments with human judgments and self-reported confidence levels. The outcomes of this project have the potential to enhance interview processes, improve interviewer training, and contribute to advancements in human-computer interaction and affective computing.

2.1.1 Proposed System

The proposed system aims to revolutionize the interview process by introducing a real-time confidence level testing mechanism. Leveraging the capabilities of webcam technology, the system analyses interviewee's eye movements and facial expressions to gauge their confidence levels during the interview. Based on the analysis of facial expressions and eye movements, the system will assign a confidence score to the interviewee, indicating their level of confidence during the interview. The results of the confidence level assessment will be presented visually using bar charts and pie charts. Bar charts can display the distribution of confidence levels among interviewees, while pie charts can show the proportion of different confidence levels.

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The "Interview Confidence Level Analyzer" is an innovative software system designed to revolutionize the assessment process of interviewee confidence during video interviews. This section provides an overview of the project's perspective, functionality, users and characteristics.

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There are two types of users that interact with the webpage are interviewers and interviewees. The users can analyse their confidence level which will be represented as pie chart and bar chart.

WriteWell

PROJECT REPORT

Submitted By

SHANIK Y S

Reg. No. CCAVSCS017

for the award of the Degree of

Bachelor of Science (B.Sc.)

in Computer Science
(University of Calicut)

under the guidance of

Ms. Vandana T V

Assistant Professor

BSc. COMPUTER SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE(Autonomous)
IRINJALAKUDA, KERALA
INDIA
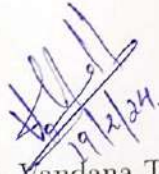
July 2021-2024

DEPARTMENT OF COMPUTER SCIENCE

CHRIST COLLEGE (AUTONOMOUS)

IRINJALAKUDA
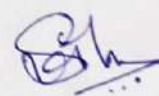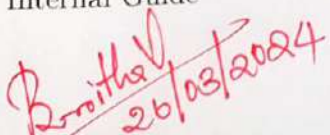
CERTIFICATE

This is to certify that the project report entitled *"Write Well"* is a bonafide record of the project work done by **Shanik Y S** in partial fulfillment of the requirement for the sixth semester of **Bachelor of Computer Science** in Department of Computer Science of **CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

Ms. Vandana T V
Assistant Professor,CS
Internal Guide

Ms. Sini Thomas
Head of the Department
Computer Science

26/03/2024

EXTERNAL EXAMINER

INTERNAL EXAMINER

DECLARATION

I hereby declare that this project work **"WriteWell"** submitted to Christ College (Autonomous) Irinjalakuda, affiliated to Calicut University in partial fulfillment of the requirement for the award of the Bachelor of Computer Science, is a record of original work done by us, under the guidance of Ms. VANDANA T V, Department of computer Science.

Place: Irinjalakuda   SHANIK Y S

ACKNOWLEDGEMENT

First and foremost I like to thank Lord almighty for his providence and for being the guiding light throughout the project. I wish to express my sincere gratitude to our beloved Department head for giving me all the facilities for our project. I take this opportunity to express my gratitude to the class teacher Ms. RASMI P M and head of the department Ms. SINI THOMAS who has been supported us throughout the course of this project. I are thankful for her aspiring guidance and valuable advice during the project work. I express my sincere thanks to my project guide Ms. VANADANA T V for supporting and guiding throughout the project.I would take this opportunity to specially thank all other faculty members for their constant and continuous motivation. Finally I would like to thank my family and friends for giving valuable advice and moral support throughout our project.

ABSTRACT

WriteWell aims to provide users with a versatile linguistic toolset, offering the ability to translate text, PDF documents, audio files, and images. The platform incorporates multiple functionalities, including translation services powered by APIs such as Google Cloud Translation or Microsoft Translator. Users can seamlessly input text, upload PDFs, audio files, or images, receiving accurate translations in return.Furthermore, the web app incorporates a grammar checker to enhance the quality of written content. The grammar checker feature helps users refine their text by identifying and suggesting corrections for grammatical errors. This ensures that the translated content maintains a high standard of language accuracy.

In addition to translation and grammar checking, the web app includes an English grammar quiz chatbot. This interactive feature engages users in a quiz format, assessing their understanding of English grammar rules. The chatbot provides instant feedback and explanations, contributing to a dynamic and educational user experience.

Overall, this web application serves as a comprehensive linguistic tool, combining translation capabilities, grammar checking features, and an interactive grammar quiz chatbot to cater to diverse language-related needs.

Contents

Chapter 1

1 Introduction

Embark on a linguistic odyssey with our state-of-the-art web application, a versatile and all-encompassing tool that redefines the way we communicate. Offering a suite of features that spans text, audio, image, and PDF translation, our platform goes above and beyond by incorporating a sophisticated grammar checker. More than a mere translation aid, this web application becomes your linguistic companion, facilitating a nuanced and polished communication experience across various mediums.Amidst the myriad of language-related challenges, our grammar checker emerges as a beacon of precision. It meticulously analyzes your written content, ensuring grammatical excellence and elevating the quality of your expression. This innovative feature goes beyond traditional language tools, providing users with a holistic solution for enhancing both translation accuracy and grammatical finesse.Providing a q/a chatbot about english garmmar which helps the user to improve their english language skill .In a world where effective communication is paramount, our web application stands as a testament to technological innovation. Join us in exploring the seamless integration of translation and grammar checking, creating a unique synergy that sets this platform apart. Elevate your communication game and unlock a new realm of linguistic prowess with our web application—an embodiment of precision, clarity, and excellence in the art of expression.

1.1 Overview

The objective of the Writewell is to Develop a system which able to do conversation between the languages . It will provide fast and accurate feedback on the quality of the user's writing . And also to support multiple languages , and adapt to the user's preferences and needs.It is used for solving every queries to user about the grammar of the language. It will help the user to learn different language . a linguistic marvel designed to reshape how we interact with language. Boasting an array of features that span text, audio, image, and PDF translation, our platform takes communication to the next level by incorporating an advanced grammar checker. This tool, far more than a translation companion, becomes your guide to refined expression, ensuring not only accurate translation but also grammatical excellence. The grammar checker, a standout feature, meticulously refines your written content, elevating it to a new standard of clarity. Finally a chatbot that helps your english skill by providing grammar quiz.This integration of translation and grammar checking offers users a comprehensive solution, addressing the diverse linguistic challenges faced in our interconnected global landscape.it involves perfecting the nuances of expression. With our web application, witness the seamless synergy of translation and

grammar enhancement, unlocking a realm of precision, clarity, and excellence in communication.

Chapter 2

2 System Analysis

2.1 Purpose

The web application has been meticulously crafted with a multifaceted purpose, aspiring to redefine and elevate the user experience in effective communication across a spectrum of mediums. Its expansive repertoire of features encompasses not only text, audio, image, and PDF translation but also introduces an advanced grammar checker and a quiz chatbot, distinguishing it as a comprehensive language tool. Beyond the conventional boundaries of translation, this integrated grammar checker is designed to ensure not just linguistic accuracy but also grammatical excellence,the chatbot helps the individual to improve their english grammar, reflecting the platform's commitment to refining written expression.

In addressing the diverse needs of users, the web application emerges as a holistic language solution, seamlessly navigating personal, academic, and professional spheres. The versatility embedded in its design enables users to adapt the application to various linguistic challenges, positioning it as an adaptive and indispensable tool. This innovative approach to communication technology sets the platform apart, ushering in a new era where precision, clarity, and linguistic proficiency converge.

Furthermore, the web application serves as a catalyst for global connectivity, facilitating effective communication in our interconnected world. By prioritizing accessibility and understanding across different languages and cultural contexts, the platform becomes a bridge for fostering meaningful connections. In summary, the web application transcends conventional boundaries, presenting itself as a transformative language companion that not only breaks down language barriers but also enriches the quality of expression in our dynamic and interconnected global landscape.

2.1.1 Existing System

Presently there are lot of grammer checker applications and translation applications .In all of those systems it takes the text input given by the user and clear all the grammar mistake that are present in the sentence/paragraph and paraphrase . The whole sentence/paragraph is converted into different form that is perfect to use in an official content . Even though they are using many machine learning algorithms , Optical character recognition , N-Gram and sequence to sequence are the main algorithm that are used in these . The existing system likely includes basic language translation features for text and, possibly, audio. It might lack the integration of advanced grammar checking capabilities, focusing primarily on straightforward translation services. The range of supported

mediums such as images and PDFs might be limited compared to the proposed system.

Furthermore, the user interface and overall user experience in the existing system might not be as streamlined and versatile. It might lack certain functionalities that enhance user convenience and adaptability across different linguistic scenarios.

In terms of global connectivity, the existing system may not prioritize cultural nuances and diverse language contexts as comprehensively as the proposed system. It might lack features that address the specific challenges associated with refined communication in an interconnected world.

In essence, the existing system, which may have served adequately in its time, is likely to lack some of the innovative features and capabilities introduced by the proposed system. The proposed system aims to overcome these limitations by offering a more comprehensive, versatile, and refined language solution for users.

2.1.2 Proposed System

Compared to existing system we are also using the same machine learning algorithms for our system . We are trying to combine all the functions provided by the grammar checking web apps and translation apps into a single window that makes our system user-friendly .We can use it as a language guide for travelers ,students ,employees etc .The proposed system is a comprehensive and innovative web application designed to redefine language interaction and communication. This dynamic platform encompasses a range of features, including text, audio, image, and PDF translation, aiming to facilitate seamless understanding across diverse mediums. Notably, the system distinguishes itself by incorporating an advanced grammar checker.There is a chatbot which helps to improve our english language to which elevating it beyond traditional translation tools and emphasizing the importance of grammatical precision in communication.

At its core, the proposed system seeks to address the evolving needs of users in personal, academic, and professional spheres. The versatility embedded in its design allows users to navigate various linguistic challenges, providing a holistic language solution. The integration of a grammar checker stands as a testament to the system's commitment to refining written expression, ensuring that translated content not only maintains accuracy but also adheres to grammatical excellence.

Moreover, the system positions itself as an innovative solution for global communication, fostering connectivity in our interconnected world. By promoting accessibility and understanding across different languages and cultural contexts, the proposed system emerges as a facilitator of meaningful and effective communication.

In summary, the proposed system represents a pioneering approach to language technology, offering a transformative experience by breaking down language barriers, promoting linguistic proficiency, and setting a new standard for

STOCK PRICE PREDICITON

PROJECT REPORT

Submitted By

SOWMYA HARIHARAN

Reg. No. CCAVSCS018

Bachelor of Science (B.Sc.)

in Computer Science
(University of Calicut)

under the guidance of

Ms. Sini Thomas

Head Of the Department

B.Sc. COMPUTER SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE
IRINJALAKUDA, KERALA
March 2024

DEPARTMENT OF COMPUTER SCIENCE

CHRIST COLLEGE (AUTONOMOUS)

IRINJALAKUDA

CERTIFICATE

This is to certify that the project report entitled *"Stock Price Prediction"* is a bonafide record of the project work done by **Sowmya Hariharan** in partial fulfillment of the requirement for the sixth semester of **Bachelor of Computer Science** in Department of Computer Science of **CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

Ms. Sini Thomas
Head Of the Department
Internal Guide

Ms. Sini Thomas
Head Of the Department
Computer Science

26/03/2024

EXTERNAL EXAMINER

26/03/24

INTERNAL EXAMINER

DECLARATION

I hereby declare that this project work **"STOCK PRICE PREDIC-TION"** submitted to Christ College (Autonomous) Irinjalakuda, affiliated to Calicut University in partial fulfillment of the requirement for the award of the Bachelor of Computer Science, is a record of original work done by me, under the guidance of Ms. SINI THOMAS, Department of computer Science.

PLACE : IRINJALAKUDA   SOWMYA HARIHARAN

ACKNOWLEDGEMENT

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ABSTRACT

STOCK PRICE PREDICITION is a system that aims to predict
the future value of the financial stocks of a market.The recent trend in stock
market prediction technologies is to use of machine learning which makes
predictions based on the values of current stock market indices by training
on their previous values. Machine learning itself employs different models to
make predictions easier and authentic. This documentation focuses on the
use of LSTM- LONG SHORT TERM MEMORY based Machine learning
to predict stock values. Factors considered are open,close,low,high,adjacent
value and volume.

Contents

Chapter 1

1 INTRODUCTION

The world of finance has long been captivated by the elusive quest for accurate stock prediction. In recent years, advancements in technology and data analytics have revolutionized this pursuit, offering unprecedented opportunities for investors and researchers alike. This project delves into the realm of stock prediction, employing cutting-edge machine learning algorithms and statistical techniques to forecast the future movements of various stocks. By analyzing historical data, market trends, and a plethora of other factors, this report aims to provide a comprehensive overview of the methodologies, challenges, and outcomes associated with stock prediction in today's dynamic financial landscape. Through meticulous analysis and interpretation, this study endeavors to shed light on the complexities of stock markets and offer insights that can inform decision-making processes for investors and financial institutions Accurate prediction of stock prices plays an increasingly prominent role in the stock market where returns and risks fluctuate wildly, and both financial institutions and regulatory authorities have paid sufficient attention to it. As a method of asset allocation, stocks have always been favored by investors because of their high returns. The research on stock price prediction has never stopped. In the early days, many economists tried to predict stock prices. Later, with the in-depth research of mathematical theory and the vigorous development of computer technology, people have found that the establishment of mathematical models can be very good, such as time series model, because its model is relatively simple and the forecasting effect is better. Time series model is applied in a period of time The scope gradually expanded. However, due to the non-linearity of stock data, some machine learning methods, such as support vector machines. Later, with the development of deep learning, some such as RNN, LSTM neural Networks, they can not only process non-linear data, but also retain memory for the sequence and retain useful information, which is positive. It is required for stock data forecasting. This article introduces the theoretical knowledge of time series model and LSTM neural network, and select real stocks in the stock market, perform modeling analysis and predict stock prices, and then use the root mean square error to compare the prediction results of several models. Since the time series model cannot make good use of the non-linear part of the stock data, can't perform long-term memory, and LSTM neural network makes better use of non-linear data and has better use of sequence data. Useful information in the long-term memory, which makes the root mean square error of the prediction result, the LSTM neural network needs smaller than the time series model, indicating that LSTM neural network is a better stock price forecasting method. The time series for stock prices belong to non-stationary and non-linear data, making the prediction of future price trends extremely challenging. In order to learn the long-term dependence of stock prices, deep learning methods such as the LSTM method are used to obtain longer data dependence and overall

change patterns of the stocks.

1.1 Overview

The objective of stock price predictions is to provide investors and traders with insights into potential future movements in stock prices, enabling them to make informed decisions. By analyzing historical data and employing various statistical and machine learning techniques, stock price prediction models aim to forecast the direction and magnitude of price changes over different time horizons. These predictions serve several purposes, including guiding investment decisions, managing risk, optimizing portfolios, and devising trading strategies. Ultimately, the goal is to leverage predictive analytics to enhance financial decision-making and achieve desired investment outcomes in dynamic and uncertain market

1.2 Stock Market

A stock market, equity market or share market is the aggregation of buyers and sellers (a loose network of economic transactions, not a physical facility or discrete entity) of stocks (also called shares), which represent ownership claims on businesses; these may include securities listed on a public stock exchange as well as those only traded privately. Examples of the latter include shares of private companies which are sold to investors through equity crowd funding platforms. Stock exchanges list shares of common equity as well as other security types, e.g. corporate bonds and convertible bonds. Stock price prediction is one of the most widely studied problem, attracting researchers from many fields. The volatile nature of the stock market makes it really difficult to apply simple time-series or regression techniques. Financial institutions and active traders have created various proprietary models to beat the market for themselves or their clients, but rarely did anyone achieve consistently higher than the average returns on investment. The challenge of stock market price forecasting is so appealing because an improvement of just a few points of percentage can increase the profit by millions of dollars. This paper discusses the application of Support Vector Machines and Linear Regression in detail along with the pros and cons of the given methods.

1.3 LSTM - Long Short Term Memory

LSTM networks are an extension of recurrent neural networks (RNNs) mainly introduced to handle situations where RNNs fail.

- It fails to store information for a longer period of time. At times, a reference to certain information stored quite a long time ago is required to predict the current output. But RNNs are absolutely incapable of handling such "long-term dependencies".

- There is no finer control over which part of the context needs to be carried forward and how much of the past needs to be 'forgotten'.

- Other issues with RNNs are exploding and vanishing gradients (explained later) which occur during the training process of a network through back-tracking.

Thus, Long Short-Term Memory (LSTM) was brought into the picture. It has been so designed that the vanishing gradient problem is almost completely removed, while the training model is left unaltered. Long-time lags in certain problems are bridged using LSTMs which also handle noise, distributed representations, and continuous values. With LSTMs, there is no need to keep a finite number of states from beforehand as required in the hidden Markov model (HMM). LSTMs provide us with a large range of parameters such as learning rates, and input and output biases.

1.4 Time Series Model

Stationary time series are divided into strictly stationary time series and wide stationary time series. Below we introduce their definitions. Strictly stationary time series provide important theoretical significance, but it is difficult to obtain the joint distribution of random sequences in the actual research process. Therefore, in order to better use in practical applications, researchers have defined a relatively weak wide stationary time sequence. Researchers choose to use the characteristic statistics of the sequence to define wide stationarity, which can make the constraint conditions a little looser. By ensuring the stationarity of the low-order moments of the sequence to ensure that the sequence can be approximately stationary. Time series analysis also belongs to the field of statistics. It can also analyze the population through samples like statistics. And from the statistical theorems, we can know that the number of random variables is directly proportional to the complexity of the analysis, and the sample size is inversely proportional to the accuracy of obtaining the overall information (obviously the sample information obtained when the population is selected as the sample is Overall information, but such an operation is obviously unrealistic). But time series data has its peculiarities. For a time series $\cdots, X_1, X_2, \cdots, X_t, \cdots$, its value X_t at any time t is a random variable, and since time is one-way, it cannot be repeated , So we can only get one sample value in this way, which leads to too little sample information for statistical analysis. But if we have the concept of stationarity, this problem will be solved.

Chapter 2

2   SYSTEM ANALYSIS

2.1   Purpose

The main purpose of stock price predictions is to assist investors and traders in making informed decisions about buying, selling, or holding stocks. These predictions aim to provide insights into the potential future movements of stock prices, helping individuals and institutions navigate the complexities of the financial markets and optimize their investment strategies

2.1.1   Existing System

The existing system for stock price prediction typically involves traditional statistical methods, such as moving averages, ARIMA (AutoRegressive Integrated Moving Average), and other time series forecasting techniques. These methods often rely on historical price data and assume certain patterns in the data to make predictions. Limitations of Existing System: The traditional methods may struggle to capture complex patterns and dependencies present in financial time series data.

2.1.2   Proposed System

The proposed system is to use LSTM for prediction. The limitation of the existing system is overcome by LSTM, a type of recurrent neural network (RNN). LSTM is particularly effective for handling long-range dependencies and capturing intricate patterns in sequential data, making it well-suited for stock price prediction. Advantages of Proposed System : LSTM-based models can learn from historical data with memory capabilities, allowing them to adapt to changing market conditions and capture subtle trends that may not be evident with simpler techniques.

2.2   Problem definition

To know what the problem is and what the needs are before developing it. Here we design a model to predict the stock price of a market.

2.3   Feasibility Study

After the problem is clearly understood and solutions proposed, the next step is to conduct the feasibility study. Feasibility study is defined as evaluation or analysis of the potential impact of the proposed project or program. The objective is to determine whether the proposed system is feasible. There are three aspects of feasibility study to which the proposed system is subjected as discussed below.

FOREST FIRE DETECTION

PROJECT REPORT

Submitted By

ADARSH P S

Reg. No. CCAVSCS019

for the award of the Degree of

Bachelor of Science (B.Sc.)

in Computer Science
(University of Calicut)

under the guidance of

Ms. Priyanga K K

Assistant Professor

BSc. COMPUTER SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE(Autonomous)
IRINJALAKUDA, KERALA
INDIA

March 2024

DEPARTMENT OF COMPUTER SCIENCE

CHRIST COLLEGE (AUTONOMOUS)

IRINJALAKUDA

CERTIFICATE

This is to certify that the project report entitled **"FOREST FIRE DE-TECTION"** *is a bonfied record of the project work done by* **Adarsh P S** *in partial fulfillment of the requirement for the sixth semester of* **Bachelor of Computer Science** *in Department of Computer Science of* **CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

Ms. Priyanga K K   Ms. Sini Thomas
Assistant Professor,CS   Head of the Department
Internal Guide   Computer Science

EXTERNAL EXAMINER   **INTERNAL EXAMINER**

DECLARATION

I hereby declare that this project work **"FOREST FIRE DETEC-TION"** submitted to Christ College (Autonomous) Irinjalakuda, affiliated to Calicut University in partial fulfillment of the requirement for the award of the Bachelor of Computer Science, is a record of original work done by me, under the guidance of Ms.PRIYANGA K K, Department of computer Science.

Place: Irinjalakuda   ADARSH P S

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ABSTRACT

In contemporary applications, the imperative nature of effective fire detection is evident in ensuring the safety and security of diverse domains such as video surveillance and safety infrastructure. This project introduces an innovative hybrid approach that seamlessly integrates the interpretability of traditional machine learning models with the intricate feature extraction capabilities of deep learning, aiming to achieve a nuanced and high-performance fire detection system. By combining the strengths of both paradigms, the proposed approach addresses the complexities inherent in fire detection tasks

Contents

Chapter 1

1 Introduction

Fire incidents pose significant threats to individuals, communities, and the environment. The severity of these threats can vary depending on the nature of the fire, its location, and the response capabilities in place.The ability to detect fires in videos has emerged as a critical imperative for facilitating early intervention and effective mitigation strategies. This project serves as a vanguard, introducing an innovative and technologically advanced approach to fire detection in videos and images through the application of machine learning techniques and deep learning techniques. In the realm of video surveillance, the ubiquity of camera systems has soared, making it increasingly imperative to harness these systems to bolster the rapidity and efficacy of fire detection. The motivation behind this research stems from the recognition that conventional fire detection methods often fall short in swiftly identifying emerging fire threats. Leveraging video data offers a unique opportunity to address this pressing issue, as it can provide a visual stream of information that can be analysed in real-time. However, the endeavour of fire detection in video data is not without its multifaceted challenges. Videos are inherently dynamic and complex, replete with intricate visual details and often significant variations in lighting, weather conditions, and perspectives. Distinguishing between normal activities and the onset of a fire event can be a formidable task. .

1.1 Overview

Additionally, the stakes are exceptionally high in fire detection, as delayed or inaccurate detection can lead to catastrophic consequences, including loss of life, extensive property damage, and environmental degradation. To address these formidable challenges, this research embarks on a pioneering journey into the realm of machine learning. Machine learning, a subfield of artificial intelligence, offers the promise of automating the process of fire detection in videos, potentially revolutionizing the field of fire safety. By training machine learning models to recognize the distinctive visual patterns associated with fires, it becomes possible to create an efficient and accurate fire detection system. The primary objective of this research is crystal clear: to develop a fire detection system for videos that is not only efficient but also highly accurate. Such a system could serve as an invaluable tool for public safety, as it has the potential to drastically reduce response times when fires break out. The importance of early fire detection cannot be overstated, as it can mean the difference between containing a fire in its nascent stage and grappling with an uncontrolled inferno. As we delve deeper into the subsequent sections of this paper, we will unravel the intricate steps and methodologies involved in achieving this ambitious objective. We will explore the nuances of data collection, highlighting the importance of

creating a diverse dataset of videos containing both fire and non-fire scenarios. We will delve into the intricacies of data preprocessing, which involves tasks such as frame extraction, feature extraction, and data format conversion, all of which are essential for rendering video data amenable to machine learning analysis. The core of our approach revolves around the design and training of a machine learning model, such as a convolutional neural network (CNN) or recurrent neural network (RNN), tailored explicitly for fire detection. These models will be endowed with the ability to sift through vast streams of video data in real-time, distinguishing between benign scenes and the critical emergence of a fire.

Chapter 2

2 System Analysis

2.1 Purpose

The overarching purpose of the Fire Detection project lies in addressing the imperative need for an advanced, automated system capable of real-time fire detection. This purpose emerges from the recognition of the limitations within the existing manual fire detection processes and aims to harness the synergy of Convolutional Neural Networks (CNN)and understand the specific needs and objectives of stakeholders, including government agencies, environmental organizations, and communities, regarding forest fire detection and management.

2.1.1 Existing System

- Machine Learning models are created to detect fire.

- Randomforest and knn models are created.

- Training Data:The training data is loaded using the ImageDataGenerator from the Keras library.

- The training data is organized in two directories: one for training and validation (Training and Validation), and another for testing (Testing).

- The script assumes a binary classification task with classes labeled as 0 (No Fire) and 1 (Fire).

- Model Training:Two classifiers are used: Random Forest and k-Nearest Neighbors (KNN).

- The classifiers are trained on flattened images obtained from the training dataset.

- Trained models are saved using joblib.

2.1.2 Proposed System

- Forest fire Detection is done using Convolutional Neural Network (CNN) using the TensorFlow and Keras libraries. Here's an overview of the key components:

- Data Preparation:Image data is loaded using ImageDataGenerator from directories containing training and testing images.

- The images are resized to (150, 150) pixels and normalized by rescaling pixel values to the range [0, 1].

- CNN Model Architecture: A sequential model is created with the following layers:

- Convolutional layer with 32 filters, kernel size (3,3), and ReLU activation.

- MaxPooling layer with a pool size of (2,2).

- Additional convolutional and max-pooling layers to capture hierarchical features.

- Flattening layer to convert the 2D feature maps to a 1D vector.

- Fully connected Dense layer with 512 units and ReLU activation.

- Output layer with a single neuron and sigmoid activation for binary classification.

2.2   Problem definition

The existing manual processes for fire detection present a myriad of challenges that underscore the critical need for a technological solution. The key issues identified in the current system include:

- Time Inefficiency: The reliance on manual inspection for fire detection introduces a significant time lag in identifying potential threats. Human operators must painstakingly review images and videos, leading to delays that could prove detrimental in emergency situations. The inefficiency of the manual process underscores the necessity for an automated system that can rapidly analyse and respond to fire-related incidents.

- Potential for Delayed Response: The manual nature of the existing system increases the risk of delayed responses during critical situations. The time taken to visually inspect each image or video introduces a variable that could impact the effectiveness of emergency response measures. A delayed response poses a serious threat to both property and lives, emphasizing the need for a more prompt and automated fire detection system.

- Human Reliance and Oversight: Relying solely on human intervention for fire detection introduces the inherent risk of oversight or errors. Human operators may miss subtle signs of fire, leading to false negatives or delayed detections. The potential for oversight in a manual system compromises the reliability and accuracy of fire safety measures, necessitating a more robust and foolproof solution.

- Lack of Integration of Advanced Technologies: The absence of a dedicated system that integrates advanced image processing and machine learning exacerbates the challenges in the existing fire detection process. The manual approach lacks the capability to harness the potential of technologies like Convolutional Neural Networks (CNNs) for efficient feature extraction and pattern recognition. This technological gap underscores the need

for a more sophisticated system that can leverage these advancements for improved accuracy and speed in fire detection.

2.3   Feasibility Study

After the problem is clearly understood and solutions proposed, the next step is to conduct the feasibility study. Feasibility study is defined as evaluation or analysis of the potential impact of the proposed project or program. The objective is to determine whether the proposed system is feasible. There are three aspects of feasibility study to which the proposed system is subjected as discussed below.

2.3.1   Technical Feasibility

Assessing the technical feasibility of a project involves evaluating whether the proposed solution can be effectively developed and implemented given the available technology, resources, and expertise. Here's an analysis of the technical feasibility of the forest fire detection project:

- Feasibility: Determine if sufficient satellite imagery data of forested areas are available for training and testing the CNN model.

- Quality: Assess the quality of the available data, including spatial and spectral resolution, coverage, and consistency over time.

2.3.2   Economical Feasibility

Evaluating the economic feasibility of a project involves assessing whether the expected benefits of the project outweigh its costs. Here's an analysis of the economic feasibility of the forest fire detection project:

- Development Costs: This includes expenses related to data collection, preprocessing, model development, and software engineering. It involves salaries of data scientists, machine learning engineers, and software developers, as well as costs for computing resources and software tools.

- Infrastructure Costs: Expenses for setting up and maintaining the necessary infrastructure for data storage, model training, and deployment, such as servers, cloud services, and networking equipment.

- Training Costs: Costs associated with training personnel involved in data annotation, model development, and system deployment.

- Operational Costs: Ongoing expenses for system maintenance, data acquisition, and monitoring, including salaries for operational staff, cloud service subscriptions, and data acquisition fees.

2.3.3   Operational Feasibility

Assessing the operational feasibility of a project involves evaluating whether the proposed solution can be effectively integrated into existing operations and processes. Here's an analysis of the operational feasibility of the forest fire detection project:

- Training and Support: Provide training and support to users to familiarize them with the system's operation, interpretation of results, and response protocols.

- Workflow Integration: Integrate the forest fire detection system into existing workflows and procedures for forest monitoring, fire prevention, and emergency response.

- Infrastructure Scalability: Ensure that the underlying infrastructure, including servers, storage, and network resources, can scale up or down to meet changing operational needs.

- Operational Costs: Assess the operational costs associated with deploying and maintaining the forest fire detection system, including personnel, infrastructure, data acquisition, and ongoing support.

Chapter 3

3 Software Requirement Specification

3.1 Purpose

The purpose of this section is to succinctly articulate the objectives and goals of the "Forest Fire Detection" project's Software Requirement Specification (SRS) document. It serves to outline specific requirements, ensuring the system aligns with its intended functionalities, providing a clear roadmap for development and implementation.

3.2 Scope

The scope of the project defines the boundaries of the system. It describes what is included and what is excluded from the project. For the "Forest Fire Detection" the scope encompasses the development of a web-based fire detection system that utilizes CNN for real-time image and video analysis

3.3 Overall Description

This section give an overview of our project, Forest Fire Detection.

3.3.1 Product Perspective

The product perspective outlines how the fire detection system fits into the larger context of related systems or external components. In this case, the system is a standalone web application that integrates CNN-based image processing for fire detection.

3.3.2 Product Functionality

The product functionality section details the features and capabilities of the system for "Forest Fire Detection," the key functionalities include:

- Automated Fire Detection: The system uses a trained CNN model for automated detection of fire in images and videos.

- User Authentication: Secure access controls ensure that only authenticated users can use the fire detection functionalities.

- User-Friendly Interface: The Django web application provides an intuitive platform for users to interact with the system.

- Real-time Insights: The system delivers real-time insights into the presence of fire in images and videos.

3.3.3 Users and Characteristics

This section describes the various types of users who will interact with the system and their characteristics. For "Forest Fire Detection," the users can be categorized as follows:

- General Users: These are individuals who access the system to upload images and videos for fire detection.

- Administrators: Responsible for managing user accounts, overseeing system functionality, and ensuring security measures.

3.4 Specific Requirements

3.4.1 Hardware Requirements

- CPU (Central Processing Unit):A multi-core processor with sufficient processing power to handle the training and prediction tasks of the Convolutional Neural Network (CNN).

- GPU (Graphics Processing Unit) (Optional but recommended for faster training):A dedicated GPU, such as NVIDIA GeForce or Tesla series, can significantly accelerate the training process of the CNN model.

- Memory (RAM):Adequate RAM to support the concurrent execution of machine learning tasks and web application processes.

- Storage:Sufficient storage space for storing datasets, trained models, and other project-related files.

- Camera (for testing real-time fire detection):A webcam or any compatible camera device for testing the real-time fire detection capabilities of the system.

- Keyboard: Standard

- Mouse: Standard

- Monitor: SVGA Color

3.4.2 Software Requirements

- Operating System:Windows, Linux, or macOS.

- Machine Learning Stack:TensorFlow,Keras

- Database Management System:SQLite

- Technologies used: HTML, CSS, JavaScript, Bootstrap,Django Web Framework

3.5   Functional Requirements

It contains two main modules.

- .Data Processing Module:

- .CNN Model Module:

Data Processing Module

This module is responsible for acquiring, preprocessing, and preparing the input data for the CNN model.

CNN Model Module

This module implements the CNN architecture for detecting forest fires from the processed satellite imagery data.

3.6   Non Functional Requirements

Non-functional requirements define the overall qualities or attributes of the resulting system. Non-functional system place restrictions on the product being developed, the developed process, and specify external constraints that the product must meet. Examples of non-functional requirements include safety, security, usability, reliability and performance requirements. Project management issues (costs, time and schedule) are often considered as non-functional requirements. The principal non - functional constraints which are relevant to critical systems :

- performance

- security

- safety

- usability

Performance

Performance requirements concern the speed of operation of a system. Types of performance requirements :

- Response requirements (how quickly the system reacts to a user input).

- Throughput requirements (how much the system can accomplish within a specified amount of time).

- Availability requirements (is the system available for service when requested by end users). The speed of operation of this system is adequate for the requirements.

Reliability

- Reliability is the ability of a system to perform its required function under stated conditions for a specified period of time.

- constraints on the runtime behavior of the system. This system is reliable because its functionalities can be done on the required conditions.

Safety

Safety requirements are not required which exclude unsafe situation from the possible solution of the system.

Usability

Usability is the ease with which a user can learn to operate, prepare inputs for, and interpret outputs of system or components. Usability requirements include :

- information error messages.

- well-formed user interfaces.

3.7   Interface Requirements

3.7.1   Hardware interfaces

The system must run over the internet, all the hardware shall require to connect internet will be hardware interface for the system. As for example modem, WAN-LAN.

3.7.2   Software interfaces

Software interface required for the working of the project is the appropriate operating system.

3.7.3   Communication interfaces

The communication interfaces are crucial for seamless interaction between different components of the system, facilitating data flow and real-time updates.

3.8   Security Requirements

- User Authentication:The system employs robust user authentication mechanisms within the Django web application to ensure secure access to fire detection functionalities

- Data Encryption:The project incorporates data encryption protocols to safeguard sensitive information, especially during image and video uploads.

- Model Security:Measures are in place to secure the trained CNN model, preventing unauthorized access or tampering.

- Secure File Handling:File uploads are subjected to rigorous validation and scanning to prevent potential security threats.

3.9   Platform Used

In a forest fire detection project using CNN architecture, various platforms and technologies are typically employed for data processing, model development, deployment, and visualization. Here are some commonly used platforms for different stages of the project:

- Model Development and Training:TensorFlow,PyTorch,Keras

- Visualization:Matplotlib,OpenLayers

3.10   Technologies Used

Front end

HTML, CSS, JavaScript, and Bootstrap are employed for frontend development, ensuring a responsive and visually appealing user interface.

Backend Technology

Django serves as the backend framework, facilitating the implementation of server-side logic and seamless integration with the frontend,Python's readability and flexibility contribute to the efficiency of backend development.

Machine Learning Technologies:

TensorFlow and Keras are employed for implementing the CNN-based model for feature extraction and fire prediction, The use of Artificial Neural Network (ANN) further enhances the accuracy of fire detection in input images and videos.

Chapter 4

4   Design Document

4.1   Purpose

The purpose of this design document is to outline the architectural and functional aspects of the Fire Detection project, providing a blueprint for the implementation of the automated fire detection system. It serves as a guide for developers, detailing the structure, components, and interactions within the system.

4.2   Scope

The scope of the project includes the development of a web-based fire detection system using Convolutional Neural Networks (CNN) architecture. The system will allow users to upload images and videos for real-time fire detection. Additionally, user authentication will be implemented to ensure secure access, and the project aims to contribute to enhanced safety measures in diverse environments.

4.3   Overview

The Fire Detection system comprises two main modules: the Machine Learning (ML) Module and Python web framework.

4.4   Dataset

In a project for forest fire detection using CNN architecture, the choice of dataset is crucial for training and evaluating the model: The Training and Validation directory contains subdirectories Fire and NoFire, where images with fire instances are placed in the Fire subdirectory, and images without fire instances are placed in the NoFire subdirectory. These images are used for training and validation. The Testing directory follows the same structure as Training and Validation, containing subdirectories Fire and NoFire, but is used exclusively for testing the trained model's performance on unseen data. Each image in the dataset serves as a training example, with the label (fire or no fire) determined by the subdirectory it belongs to. During model training, the ImageDataGenerator class from Keras is used to load and preprocess these images directly from the directory structure, enabling efficient training of the CNN model. It's important to ensure that the dataset is sufficiently diverse, with variations in lighting conditions, weather, forest types, fire sizes, and angles to improve the model's robustness and generalization ability. Additionally, having a balanced dataset with roughly equal numbers of fire and no-fire images helps prevent biases and ensures fair evaluation of the model's performance.

4.4.1   Dataset Architecture
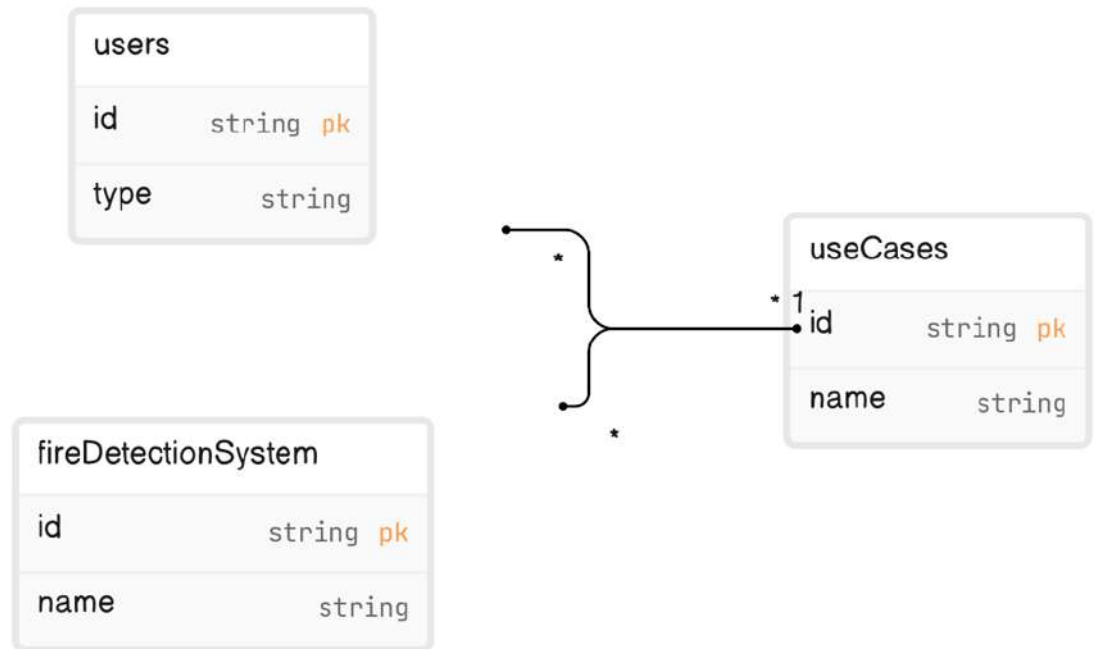
Chapter 5

5 Development of the System

The development phase of the Fire Detection system using CNN with Python involves the practical implementation of the proposed project. It encompasses several key steps and components that contribute to the seamless integration of Convolutional Neural Networks (CNN) for forest fire detection

Chapter 6

6   System Testing

Testing is the penultimate step of software development.An elaborate testing of the data is prepared and the system is using the test data,while doing testing,errors are noted and correction is made.The users are trained to operate the developed system.Both hardware and software securities are made to run the developed system successfully.System testing is aimed at ensuring the system works accurately before the live operation commences.

6.1   Test Plan

6.1.1   Scope

This test plan will cover the following testing activities as identified in the testing strategy.

- White Box Testing

White box testing is a testing technique, that examines the program structure and derives test data from the program logic/code. In white box testing, the UI is bypassed. Inputs and outputs of ratings are tested directly at the code level and the results are compared against specifications. It Reveals errors in "hidden" code.

- Black Box Testing

Black - box testing is a method of software testing that examines the functionality of an application based on the specifications. Black box testing typically involves running through every possible input to verify that it results in the right outputs using the software as an end - user would.

- Unit Testing

The module includes four main components to undergo unit testing. It checks the syntax error, logic error and validity of the program correctness. This test will be performed by the developers.

- Integration Testing

After all components pass the unit testing, they get to be tested whether they work correctly when they are running concurrently and communicating to each other. Integration tests exercise an entire subsystem and ensure that a set of components play nicely together.

- Internal Data Testing

We will test the validity of the data before it enters the database to avoid any problems that may face us in the database. We will test the encryption of the personal information of all the users along with the user names and passwords to ensure maximum security of the users privacy.

6.1.2   Software risk issues

In this section, the plan is to test the risk involved in critical issues such as:
Difficult to run on visual studio due to large loading time. Some inherent
software risks such as complexity exist; also these issues need to be identified.
Proper network connection Working of Mysql database

6.1.3   Features to be tested

- Test whether correct user name and password allows you to login.

- Test whether invalid user name and password prevents you from login.

- Test whether there is any connection problem in the Server.

- Test whether the student and admin details are entered correctly.

- Test whether invalid data entry allows saving data successfully.

- Test whether all pages are loaded correctly.

- Test whether watermark is embedded and extracted properly.

- Test whether the provided security works correctly.

6.2   Test consolidation

6.2.1   Test item

The items or features to be tested in the test cases are included in the document.
Each and every user input is tested. The present condition of the system is
tested. It is checked to make sure that environment is ready for the application
to work.

Chapter 7

7 System Implementation and Maintenance

7.1 Implementation

System implementation is the conversion of new system into an operating one which involves creating compatible files, training clients and installing hardware. User training is crucial for minimizing resistance to change and giving chance to prove its worth. Training aids user friendly manuals and healthy screens provide the user with a good start. Software maintenance follows conversion to the extent that changes are necessary to maintain satisfactory operations relative to changes in the user's environment. Maintenance often includes minor enhancements or corrections to the problem that surface late in the systems operations. In the implementation phase, the team builds the components either from scratch or by composition. Given the architecture document meant from the design phase and the requirement document from the analysis phase, the team should build exactly what has been requested, though there is still room for innovation and flexibility. For example, a component may be narrowly designed for this particular system, or the component may be made more general to satisfy a reusability

- CNN Model Training:Utilize TensorFlow and Keras to implement Convolutional Neural Networks (CNN) for model training.

- Model Persistence:Save the trained CNN model to ensure its availability for future use without the need for repetitive training.

- Fire Detection Algorithm:Implement an Artificial Neural Network (ANN) that utilizes the trained CNN model for detecting fire in input images and videos.

- Frontend Development:Utilize HTML, CSS, JavaScript, and Bootstrap to design and implement an intuitive and user-friendly frontend interface.

- Backend Development:Define views and URLs within the Django application to handle fire detection functionalities.

- Database Integration:Use SQLite as the backend database to store user data and relevant information.

7.2 Maintenance

This phase occurs as a result of deploying the whole system at the end users organization. They will perform the beta testing at the end users and inform to the developers about any needed modification to the application. The customer records all the problems that are encountered during the beta testing and reports these to the developer at regular intervals.

7.2.1   Corrective Maintenance

Even with the best quality assurance activities, it is likely that the customer will uncover defects in the software. Corrective maintenance changes the software to correct the defects. Corrective Maintenance activity may consist of repair, restoration or replacement of equipment. This activity will be result of a regular inspection, which identifies the failure in time for corrective maintenance to be planned and scheduled, then performed during a routine maintenance shutdown.

7.2.2   Adaptive Maintenance

Over time, the original environment(CPU, operating system, business rules, external product characteristics) for which the software was developed is likely to change. Adaptive maintenance results in modification to the software to accommodate changes to its external environment.

7.2.3   Enhanced Maintenance

As software is used, the customer/user will recognize additional functions that will provide the benefit. Perfect maintenance extends the software beyond its original functional requirements.

7.2.4   Preventive Maintenance

Computer software deteriorates due to change, and because of this preventive maintenance often called software re-engineering, must be conducted to enable the software to serve the needs of its end users. Preventive maintenance makes changes to computer programs so that they can be more easily corrected, adapted and enhanced.

Chapter 8

8   Conclusion and Future Scope

8.1   Conclusion

The Fire Detection project, combining Convolutional Neural Networks (CNN) with the Django web framework, represents a significant advancement in the realm of computer vision and artificial intelligence. The successful integration of TensorFlow and Keras for CNN-based feature extraction, coupled with Django's web development capabilities, results in a powerful system for automated fire detection.

8.2   Future Scope

- Integration with Cloud Services

- Continuous Model Training

- Multi-Sensor Integration

- Mobile Application Development

- Collaboration with Emergency Services

Chapter 9

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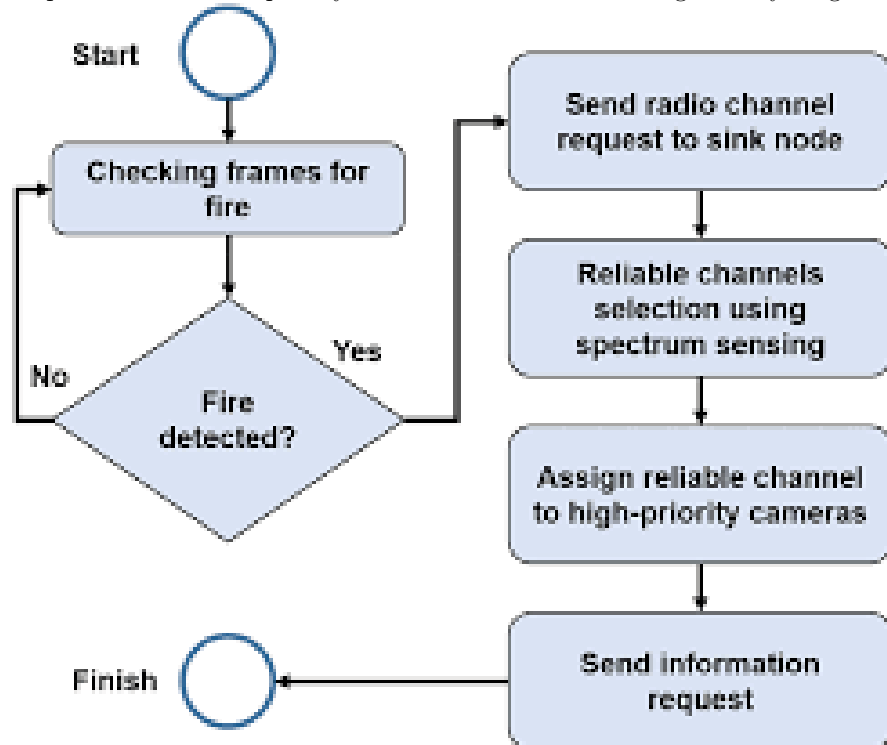
Appendix

A   SYSTEM ARCHITECTURE

- The overall architecture

- How frontend and backend gets connected
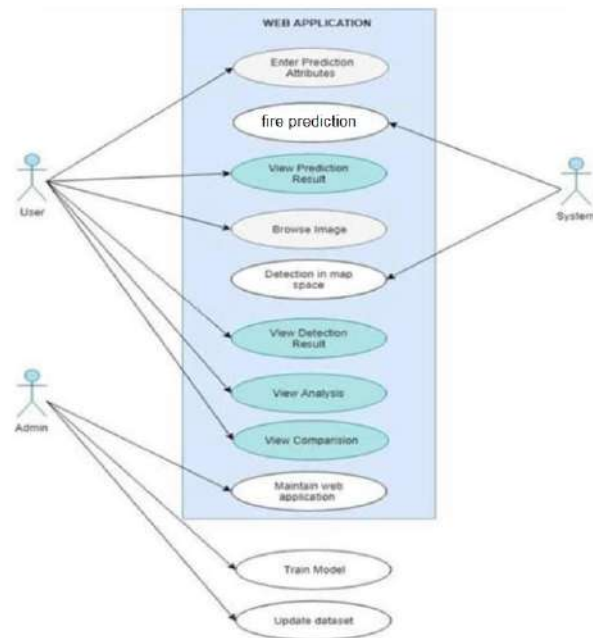

Fire Detection Project Architecture
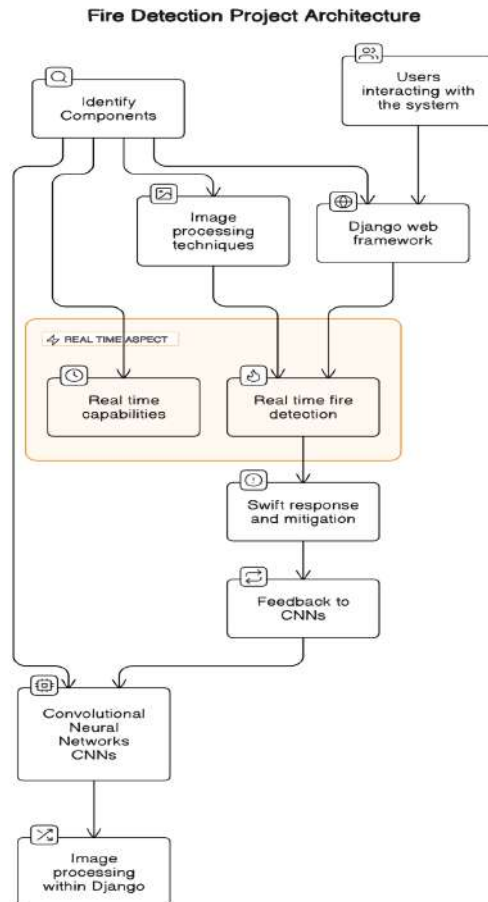
B   ACTIVITY

Activity diagrams show the flow of one activity to another within a system or process. Even complex systems can be visualized using activity diagrams.

C USECASE

Use-case diagrams describe the high-level functions and scope of a system. These diagrams also identify the interactions between the system and its actors. The use cases and actors in use-case diagrams describe what the system does and how the actors use it, but not how the system operates internally.
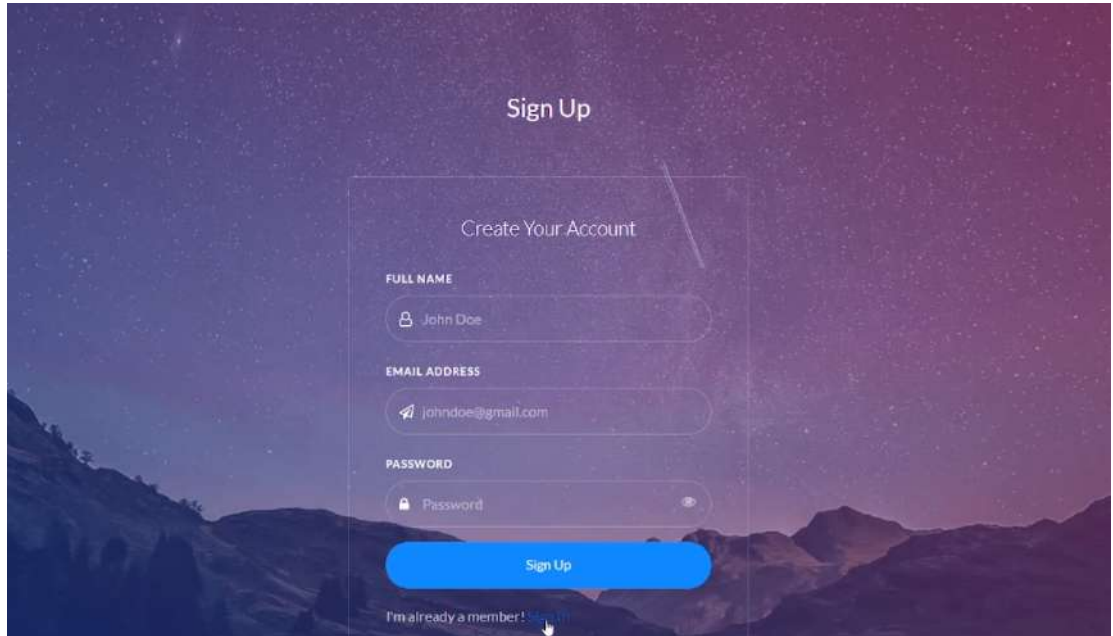
D   USER INTERFACES

D.1   HOME

D.2   ADMIN

D.3   USER

D.4   IMAGETEST

D.5 VIDEO

D.6   LOGOUT

E CODE

code.CNN

[breaklines=true]

```
//
// Source code recreated from a .class file by IntelliJ IDEA
// (powered by Fernflower decompiler)
//

          import tensorflow as tf
import numpy as np
from tensorflow import keras
import os
import cv2
from tensorflow.keras.preprocessing.image import
 ImageDataGenerator
from tensorflow.keras.preprocessing import image
import matplotlib.pyplot as plt
train = ImageDataGenerator(rescale=1/255)
test = ImageDataGenerator(rescale=1/255)
train_dataset = train.flow_from_directory(r"/content/drive/
MyDrive/fire/Training and
Validation",
                                          target_size=(150,150),
                                          batch_size = 32,
                                          class_mode = 'binary')

test_dataset = test.flow_from_directory(r"/content/drive/
MyDrive/fire/Testing",
                                          target_size=(150,150),
                                          batch_size =32,
                                          class_mode = 'binary')
test_dataset.class_indices
#model building
model = keras.Sequential()
model.add(keras.layers.Conv2D(32,(3,3),activation='relu',
input_shape
=(150,150,3)))
model.add(keras.layers.MaxPool2D(2,2))
model.add(keras.layers.Conv2D(64,(3,3),activation='relu'))
model.add(keras.layers.MaxPool2D(2,2))
model.add(keras.layers.Conv2D(128,(3,3),activation='relu'))
model.add(keras.layers.MaxPool2D(2,2))
model.add(keras.layers.Conv2D(128,(3,3),activation='relu'))
```

```
model.add(keras.layers.MaxPool2D(2,2))
model.add(keras.layers.Flatten())
model.add(keras.layers.Dense(512,activation='relu'))
model.add(keras.layers.Dense(1,activation='sigmoid'))
# Compile the model
model.compile(optimizer='adam', loss='binary_crossentropy',
 metrics
=['accuracy'])
#fitting the model
r = model.fit(train_dataset,
        epochs = 5,
        validation_data = test_dataset)
predictions = model.predict(test_dataset)
predictions = np.round(predictions)
predictions

# Save the model
model.save("fire_detection_model2.h5")

def predictImage(filename):
    img1 = image.load_img(filename,target_size=(150,150))
    plt.imshow(img1)
    Y = image.img_to_array(img1)
    X = np.expand_dims(Y,axis=0)
    val = model.predict(X)
    print(val)
    if val == 1:
        plt.xlabel("No Fire",fontsize=30)
    elif val == 0:
        plt.xlabel("Fire",fontsize=30)

from keras.models import load_model
from PIL import Image, ImageOps
import numpy as np
import cv2
import matplotlib.pyplot as plt
from IPython.display import clear_output
import time

# Disable scientific notation for clarity
np.set_printoptions(suppress=True)

# Load the model
model = load_model("/content/drive/MyDrive/fire/
fire_detection_model1.h5", compile=False)
```

```python
# Load the labels
class_names = open("/content/drive/MyDrive/
fire/labels.txt", "r").readlines()

# Create the array of the right shape to feed into the keras model
data = np.ndarray(shape=(1, 224, 224, 3), dtype=np.float32)

# Replace this with the path to your video file
video_path = "/content/drive/MyDrive/fire/fire video.mp4"
cap = cv2.VideoCapture(video_path)

while cap.isOpened():
    ret, frame = cap.read()
    if not ret:
        break

    # Convert the frame to RGB
    image = cv2.cvtColor(frame,
 cv2.COLOR_BGR2RGB)

    # resizing the image to be at least 224x224
and then
cropping from the center
    size = (224, 224)
    image = Image.fromarray(image)
    image = ImageOps.fit(image, size,
 Image.Resampling.LANCZOS)

    # turn the image into a numpy array
    image_array = np.asarray(image)

    # Normalize the image
    normalized_image_array = (image_array.astype
(np.float32) / 127.5) - 1

    # Load the image into the array
    data[0] = normalized_image_array

    # Predicts the model
    prediction = model.predict(data)
    index = np.argmax(prediction)
    class_name = class_names[index]
    confidence_score =
 prediction[0][index]

    # Display the frame
```

```
    plt.imshow(image)
    plt.title(f"Class: {class_name[2:]}
| Confidence Score:
{confidence_score:.2f}")
    time.sleep(.001)  # Adjust the sleep
 duration as needed
    clear_output(wait=True)
    plt.pause(0.1)
    plt.clf()

cap.release()
cv2.destroyAllWindows()
```

code.py

```
from django.shortcuts import render,redirect
from keras.models import load_model
from PIL import Image, ImageOps
import numpy as np
import matplotlib.pyplot as plt
import os
import cv2
from django.core.files.storage import FileSystemStorage
from django.contrib import messages
from Frotend.models import RegistrationDb


def Video_Detction(request):
    return render(request,"Video Detection_pg.html")

def Home(request):
    return render(request,"home.html")

np.set_printoptions(suppress=True)

def fire_detection_view(request):
    if request.method == 'POST':

        im=request.FILES['img']
        model = load_model(r"fire_detection_model1.h5",
compile=False)

        class_names = open(r"class_name.txt"
, "r").readlines()
```

```
        data = np.ndarray(shape=(1, 224, 224, 3),
 dtype=
np.float32)

        uploaded_image = request.FILES['img']
        image = Image.open(uploaded_image).convert
("RGB")

        size = (224, 224)
        image = ImageOps.fit(image, size,
 Image.Resampling.LANCZOS)

        image_array = np.asarray(image)

        normalized_image_array =
 (image_array.astype(np.float32) / 127.5) - 1

        data[0] = normalized_image_array

        prediction = model.predict(data)
        index = np.argmax(prediction)
        class_name = class_names[index]
        confidence_score = prediction[0][index]

        plt.imshow(image)
        plt.title(f"Class: {class_name[2:]} | Confidence Score:
{confidence_score:.2f}")
        plt.show()
        print(class_name)
        messages.success(request, f"The predicted
 class is:{class_name}")
        return render(request, 'home.html'
, {'class_name': class_name,
 'confidence_score': confidence_score})


    return render(request, 'home.html')


model = load_model("fire_detection_model1.h5",
 compile=False)
class_names = open("class_name.txt",
 "r").readlines()
```

```
# Function to preprocess image
def preprocess_image(image):
    size = (224, 224)
    image = ImageOps.fit
(image, size, Image.Resampling.LANCZOS)
    image_array = np.asarray(image)
    normalized_image_array =
(image_array.astype(np.float32) / 127.5) - 1
    return normalized_image_array

# Function to predict on a frame
def predict_frame(frame):
    pil_image = Image.fromarray
(frame).convert("RGB")
    normalized_image_array =
 preprocess_image(pil_image)
    data = np.ndarray(shape=
(1, 224, 224, 3), dtype=np.float32)
    data[0] = normalized_image_array
    prediction = model.predict(data)
    index = np.argmax(prediction)
    class_name = class_names[index]
    confidence_score = prediction[0][index]
    return class_name, confidence_score

model = load_model(r"fire_detection_model11.h5",
 compile=False)

# Load the labels
class_names = open(r"labels1.txt", "r").readlines()

data = np.ndarray(shape=(1, 224, 224, 3),
 dtype=np.float32)


def process_video(request):
    if request.method == 'POST':
        video_file = request.FILES['video']

        temp_video_path = 'temp_video.mp4'

        with open(temp_video_path, 'wb') as temp_video:
            for chunk in video_file.chunks():
                temp_video.write(chunk)

        # Open the temporary video file
```

```
    cap = cv2.VideoCapture(temp_video_path)

    while cap.isOpened():
        ret, frame = cap.read()
        if not ret:
            break

        # Resize the frame
        resized_frame = cv2.resize(frame, (224, 224),
interpolation=cv2.INTER_LINEAR)

        # Convert the frame to RGB
        image = cv2.cvtColor(resized_frame,
cv2.COLOR_BGR2RGB)

        # Normalize the image
        normalized_image_array =
(image.astype(np.float32) / 127.5) - 1

        # Load the image into the array
        data[0] = normalized_image_array

        # Predict the model
        prediction = model.predict(data)
        index = np.argmax(prediction)
        class_name = class_names[index]
        confidence_score = prediction[0][index]

        # Display the frame with class and confidence
        cv2.putText(frame, f"Class: {class_name[2:]}
| Confidence:
{confidence_score:.2f}",
                    (10, 30), cv2.FONT_HERSHEY_SIMPLEX, 1,
(0, 255, 0), 2)
        cv2.imshow('Fire Detection', frame)

        # Break the loop when 'q' is pressed
        if cv2.waitKey(1) & 0xFF == ord('q'):
            break

    cap.release()
    cv2.destroyAllWindows()



    # Handle GET requests or render a template for the form
```

```
    return render(request, 'home.html')

def Registration_Pg(request):
    return render(request,"Registration.html")


def Saveregister(request):
    if request.method == "POST":
        un = request.POST.get('Username')
        em = request.POST.get('Email')
        pwd = request.POST.get('password')
        reg = RegistrationDb(username=un,
Email=em, password=pwd)
        reg.save()
        messages.success(request,
 "Registered Successfully")
        return redirect(login)

def login(req):
    return render(req,"login.html")

def Login_Fn(request):
    if request.method=="POST":
     email=request.POST.get('em')
     passwd=request.POST.get('passwd')
     if RegistrationDb.objects.filter(Email=email
,password=passwd).exists():
        request.session['Email']=email
        request.session['password']=passwd
        messages.success(request,
 "Logged-In Successfully")
        return redirect(Home)
     else:
            messages.error(request, "Check Credentials")
            return redirect(login)
    else:
        messages.error(request, "Check Credentials")
        return redirect(login)

def Logout_fn(request):
    del request.session['Email']
    del request.session['password']
    messages.success(request,
 "Logged-Out Successfully")
    return redirect(Home)
```

AI-POWERED VIRTUAL TUTOR

PROJECT REPORT

Submitted By

AMAL KRISHNA A

Reg. No. CCAVSCS020

for the award of the Degree of

Bachelor of Science (B.Sc.)

in Computer Science
(University of Calicut)

under the guidance of

Mr.Joju Sebastian

Assistant Professor

BSc. COMPUTER SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE(Autonomous)
IRINJALAKUDA, KERALA
INDIA

March 2024

DEPARTMENT OF COMPUTER SCIENCE

CHRIST COLLEGE (AUTONOMOUS)

IRINJALAKUDA

CERTIFICATE

This is to certify that the project report entitled *"Ai-Powered Virtual Tutor"* is a bonafide record of the project work done by **AMAL KRISHNA A** in partial fulfillment of the requirement for the sixth semester of **Bachelor of Computer Science** in Department of Computer Science of **CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

19/02/2024

Mr.Joju Sebastian
Assistant Professor,CS
Internal Guide

Ms. Sini Thomas
Head of the Department
Computer Science

26/03/24

EXTERNAL EXAMINER

INTERNAL EXAMINER

DECLARATION

I hereby declare that this project work "**AI-POWERED VIRTUAL TUTOR**" submitted to Christ College (Autonomous) Irinjalakuda, affiliated to Calicut University in partial fulfillment of the requirement for the award of the Bachelor of Computer Science, is a record of original work done by me, under the guidance of Mr.JOJU SEBASTIAN, Department of Computer Science.

Place: Irinjalakuda   AMAL KRISHNA A

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ABSTRACT

AI-Powered Virtual Tutor is an web application designed to revolutionize learning experiences. The application is enriched with two kind of login facilities - admin login, user login. It conducts assessments through seamless integration with various subjects, students can access a comprehensive platform that fosters knowledge acquisition and skill development. The main features are - users can benefit from tailored lessons, real-time feedback and it allows them to track their progress. admin can register users, upload content, update website related activities and so on. All these features make this website more adaptable and user-friendly.

Contents

Chapter 1

1   Introduction

Welcome to our project on AI-powered Virtual Tutor, where learning meets innovation! Experience a transformative approach to education as we analyze your knowledge through interactive tests.In the contemporary realm of education, the integration of artificial intelligence has heralded a paradigm shift in pedagogical approaches, ushering in an era where traditional teaching methods are augmented by the capabilities of cutting-edge technology. A pinnacle manifestation of this transformation is witnessed in the emergence of AI-powered virtual tutors, sophisticated educational tools that go beyond conventional boundaries. This not only assess student's knowledge but also to provide nuanced and tailored guidance. The fundamental premise of these AI-powered virtual tutors revolves around their ability to conduct comprehensive assessments of student's understanding and proficiency across various subjects. By employing intricate algorithms, these digital tutors can analyze vast datasets, discern patterns, and evaluate a student's grasp of diverse concepts. This analytical prowess allows for a nuanced understanding of individual learning trajectories, going beyond standardized assessments to provide a more holistic view of a student's academic strengths and areas that warrant further attention. However, the true innovation lies in the personalized guidance these virtual tutors offer based on the insights gleaned from assessments. Tailored to each student's unique learning profile, these AI-powered mentors can pinpoint specific areas of improvement, recommend targeted resources, and even adapt the learning pace to accommodate individual needs. This level of personalization transcends the limitations of one-size-fits-all approaches, fostering an environment that nurtures each student's intellectual growth. As we delve deeper into the intricate capabilities of AI-powered virtual tutors, it becomes apparent that they serve as more than mere evaluators. They evolve into dynamic guides, steering students through their academic journeys with precision and adaptability. This aims to unravel the layers of this transformative technology, exploring its impact on student assessment and the provision of personalized guidance, ultimately shedding light on the profound implications it holds for the future of education.

1.1   Overview

The main aim of our AI-powered Virtual Tutor project is to revolutionize the education landscape by providing a personalized and adaptive learning experience for students. The cornerstone of our ambitious endeavor lies in the profound transformation of the educational landscape through the deployment of our AI-powered Virtual Tutor. At its core, this visionary project seeks to revolutionize traditional teaching methodologies by providing a learning experience that is not only personalized but also adaptive to the unique needs and learning styles

of individual students. The overarching objective is to propel students towards a deeper understanding and mastery of various subjects, with a specialized emphasis on programming languages like Python, HTML, and PHP. With an unwavering commitment to enhancing educational outcomes, our Virtual Tutor endeavors to usher in a new era where learning is not a one-size-fits-all endeavor but rather a dynamic and tailored experience. The focal point of our efforts is to address the intricacies of programming education, acknowledging that each student possesses distinctive strengths and areas requiring improvement. By tailoring content and guidance to these individual needs, our Virtual Tutor aims to bridge educational gaps and cultivate a holistic understanding of complex subjects. Central to the efficacy of our AI-powered Virtual Tutor is its proficiency in offering personalized guidance and real-time feedback. Gone are the days of passive learning, as our system actively engages with students, adapting its approach based on real-time assessments. This responsiveness ensures that students receive immediate insights into their progress, allowing for a continuous cycle of improvement. Through this interactive feedback loop, the Virtual Tutor becomes not just an instructor but a mentor, guiding students towards programming excellence. Imagine a world where mastering programming languages is not only a pedagogical exercise but an intuitive, engaging journey uniquely tailored to your skills. Our Virtual Tutor provides this transformative experience, transcending the conventional boundaries of education. It invites students to embrace a smarter way of learning, where the intricacies of programming are demystified, and the path to excellence becomes navigable through personalized guidance. In the pages that follow, we will delve into the intricate details of this revolutionary project, exploring how it redefines education and serves as the key to unlocking the door to programming mastery.

Chapter 2

2 System Analysis

2.1 Purpose

The purpose of our AI-powered Virtual Tutor is twofold: to accommodate the diverse learning speeds of students and to provide comprehensive support for both fast and slower learners, particularly in the context of programming education. This practical application of knowledge encourages a deeper understanding of programming concepts and enhances real-world problem-solving skills. The Virtual Tutor adapts to their quick comprehension, preventing boredom or stagnation often experienced in traditional, one-size-fits-all learning environments. The ultimate goal is to empower every student to succeed and thrive in their programming journey.

2.1.1 Existing System

The existing system of AI-powered systems can analyze a student's strengths .learning styles and creating tailored learning experiences through conducting tests. it provides instantaneous feedback to students and guiding them.it adapt to different learning styles , It also provides chatbot for instant assistance to students, answer common questions. These tools suggest additional learning resources, such as videos, or exercises based on a student's progress and interests.

2.1.2 Proposed System

This proposed system aims to create a comprehensive, adaptive, and engaging learning environment for students seeking to master Python, html and php languages.This comprehensive system conducts assessments at three proficiency levels, offering personalized guidance through videos and notes. When a student faces difficulty, the system provides instant focus points for improvement, and individual progress is meticulously tracked. Students can undertake projects from a curated list, fostering the application of theoretical knowledge in real-world scenarios. Coding challenges and assessments, tailored to each programming language, deepen the understanding of coding proficiency. The real-time chat feature connects students with experienced tutors, facilitating on-the-spot clarification and guidance. A responsive chatbot further assists in addressing queries and provides real-time problem-solving support, creating a dynamic and supportive learning environment.The system implements a certification system and issues progress reports upon course completion, offering tangible recognition of achievement. Crucially, the system also encourages student feedback for continuous improvement.To ensure seamless communication, an integrated feature allows automated report sharing via email to teachers or parents, upholding data privacy and security standards.it provides a rich and interactive learning experience for students.

2.2 Problem definition

To know what the problem is and what the needs are before developing it, current education systems lack personalization, practical application, timely feedback, robust support, effective communication, and struggle to adapt to emerging technologies, posing challenges for an optimal learning experience.

2.3 Feasibility Study

The AI-Powered Virtual Tutor web app serves as an integrated platform for automating the process of knowledge analysis in an educational context, this app allows administrators to seamlessly view and update website related activities and users can login and update their profiles. It acts as a centralized system for efficient management and interaction, emphasizing ease of use and collaborative engagement within the educational environment.

2.3.1 Technical Feasibility

Technical feasibility assess whether the current technical resources are sufficient for the new system. By considering potential upgrades to the technology supporting our website, we aim to determine if the proposed system can seamlessly integrate into the existing infrastructure without necessitating additional hardware support. This assessment includes a careful review of processing power, storage capacity, and compatibility with AI frameworks. The goal is to ensure a smooth implementation that optimizes the current system's capabilities, potentially avoiding the need for significant hardware modifications.

2.3.2 Economical Feasibility

Economic feasibility determines whether the time and money are available to develop the system.it doesn't require additional hardware for development, minimizing upfront costs. The cost-effectiveness is highlighted, making the project financially viable for implementation. This aspect contributes to efficient resource utilization and aligns with economic considerations, ensuring that the development of the virtual tutor is both feasible and economically sustainable.

2.3.3 Operational Feasibility

Operational feasibility for the AI-powered virtual tutor is high, as it requires minimal additional training for users. The system's user-friendly interface ensures accessibility for anyone with internet knowledge and proficiency in English. With existing organizational resources readily available for implementation, the operational aspect is streamlined, facilitating smooth use and maintenance of the virtual tutor. The feasibility assessment suggests that the system is well-aligned with operational capabilities and requires minimal adaptation for successful deployment.

Chapter 3

3 Software Requirement Specification

3.1 Purpose

The purpose of this document is to give a detailed description of the requirements for the web app AI-powered Virtual Tutor. It illustrate the purpose and complete description for the development of the system. It explain system constraints, interface and interactions with other external applications. It primarily intended for students learning programming languages, it offers guidance to learners of varying speeds, accommodating both those who learn slowly and quickly. Notably, this document extends its focus to students unfamiliar with cs subjects, providing an inclusive resource for a diverse range of learners.

3.2 Scope

The scope for our AI-powered virtual tutor involves simplifying and enhancing students learning experiences with systematic tracking of progress through the website. Future expansion includes the potential incorporation of online payment features for added convenience and accessibility. Also the technologies like AR/VR and IoT, catering to diverse learners and fostering collaborative global education.

3.3 Overall Description

This section give an overview of our web app AI-powered virtual tutor.it is tailored for student-centric learning, providing a dynamic platform for assessing and enhancing knowledge. Students can register from anywhere, accessing personalized assessments and visual content. The system allowing students, admins to contribute unique functions. With separate logins, it ensures a participatory and enriched learning experience, focusing on personalized knowledge analysis and skill development.

3.3.1 Product Perspective

The AI-Powered Virtual Tutor web app serves as an integrated platform for automating the process of knowledge analysis in an educational context. this app allows administrators to seamlessly view and update website related activities and users can login and update their profiles. It acts as a centralized system for efficient management and interaction, emphasizing ease of use and collaborative engagement within the educational environment.

3.3.2 Product Functionality

Through this system admin can upload various data including assessments, learning materials, and system updates.students can login and participating in registrations for assessments and projects.

3.3.3 Users and Characteristics

There are two types of users that interact with the site student, admin and teachers. Each of these have different tasks which is performed. Admin can register users, upload content and manage website features. admin has comprehensive control over the system, responsible for administrative tasks. They can access to "Forget Password" for account recover. Teachers can support students by clearing doubts through the web app and engages in direct communication with students, providing guidance and clarification. Students can register, contact teachers for doubt clarification, and provide feedback for app improvement. They can actively participates in the learning process, seeking assistance, and contributing to system enhancement

3.4 Specific Requirements

3.4.1 Hardware Requirements

- System: IBM-Compatible PC

- Processor: Intel Core i3

- Speed: Above 1GHz

- RAM capacity: 4 GB

- Hard Dsk drive: 500 GB

- Keyboard: Standard

- Mouse:Standard

- Monitor:SVGA Color

3.4.2 Software Requirements

- Operating System:Windows or ubuntu

- Language used:Python,Django

- Database : MySql

- Technologies used:HTML,Javascript,CSS,Boot Strap(keros),jquery

3.5   Functional Requirements

It contains three main modules.

- 1.Admin

- 2.Teacher

- 3.User or Student

Admin

An Admin account is used for editing or managing the website dynamically by Admin panel. Admin can register users, upload content and verification of users are done by admin.Admin can update the website related activities.and they have all the logs related to the website.

Teacher

Teachers can support students by clearing doubts through the web app and engages in direct communication with students, providing guidance and clarification.

User or Student

The user or the students can fills a simple registration form in their respective email-id. After registration,users can login to the website. They can update their profiles, and attend accessment to know their knowledge. they can also access chatbot ,contact teachers for doubt clarification, and provide feedback for app improvement.User can download his perfomance certificate.

3.6   Non Functional Requirements

Non-functional requirements define the overall qualities or attributes of the resulting system. Non-functional system place restrictions on the product being developed, the developed process, and specify external constraints that the product must meet. Examples of non-functional requirements include safety, security, usability, reliability and performance requirements. Project management issues (costs, time and schedule) are often considered as non-functional requirements. The principal non - functional constraints which are relevant to critical systems :

- performance

- security

- safety

- usability

Performance

Performance requirements concern the speed of operation of a system. Types of performance requirements :

- Response requirements (how quickly the system reacts to a user input).

- Throughput requirements (how much the system can accomplish within a specified amount of time).

- Availability requirements (is the system available for service when requested by end users). The speed of operation of this system is adequate for the requirements.

Reliability

- Reliability is the ability of a system to perform its required function under stated conditions for a specified period of time.

- constraints on the runtime behavior of the system. This system is reliable because its functionalities can be done on the required conditions.

Safety

Safety requirements are not required which exclude unsafe situation from the possible solution of the system.

Usability

Usability is the ease with which a user can learn to operate, prepare inputs for, and interpret outputs of system or components. Usability requirements include :

- information error messages.

- well-formed user interfaces.

3.7 Interface Requirements

3.7.1 Hardware interfaces

The system must run over the internet, all the hardware shall require to connect internet will be hardware interface for the system. As for example modem,WAN-LAN.For a website hosting an AI-powered virtual tutor, the hardware interfaces primarily relate to the server infrastructure and any additional hardware components required to support the functionality of the website. Server Hardware: The website needs server hardware to host its application and data. Storage Devices: Storage devices are needed to store various data, including user profiles, content, AI models, and session logs. Networking Hardware:Networking hardware facilitates communication between the web server and clients (users' devices) and between different server components.

3.7.2 Software interfaces

For a website hosting an AI-powered virtual tutor, software interfaces are essential components that facilitate communication between different software modules, services, and components.Software interface required for the working of the project is the appropriate operating system. Web Server Interface: The website operates on a web server, such as Apache, Nginx, or Microsoft IIS. The web server handles incoming HTTP requests from clients (users' web browsers) and serves web pages and other resources. Database Interface: The virtual tutor requires a database to store and manage various types of data, including user profiles, learning materials, session logs, and AI model parameters

3.7.3 Communication interfaces

To create a website for an AI-powered virtual tutor, you would typically need several communication interfaces to facilitate interaction between the user and the AI tutor. These interfaces may include:

User Interface (UI): The UI is the visual interface through which users interact with the website. It includes elements such as menus, buttons, forms, and other graphical elements.

Chat Interface: A chat interface allows users to communicate with the AI tutor via text input. Users can ask questions, seek clarification, or engage in conversation with the virtual tutor.

Feedback Interface: An essential aspect of any AI powered system is the ability to learn and improve over time. A feedback interface allows users to provide feedback on the accuracy and helpfulness of the virtual tutor's responses.

Data Input Interface: Depending on the functionality of the virtual tutor, users may need to input data such as their educational background, learning goals, or preferences.

Notification Interface: Notifications can be used to alert users about important updates, reminders, or new features related to the virtual tutor.

3.8 Security Requirements

- User accesses only their account.

- Validation of input is handled.

- This application containing the computer systems is physically secured against arms or surreptitious entry by intruders.

- Users must be authorized carefully to reduce changes of any such user giving access to an intruder in exchange for a bribe or other favour.

3.9 Platform Used

Windows 10 is a major version of the Microsoft Windows operating system that was released on July 29, 2015.It is built on the Windows NT kernel and follows windows 8.Part of the reason Microsoft decided to name the 2015 release "Windows 10"(and skipped "windows 9")is because the operating system is designed to be a new direction for Microsoft. One of the primary aims of windows 10 is to Unify the windows experience across multiple devices, such desktop computers, tablets, and smartphones. As part of this effort, Microsoft developed Windows10 Mobile alongside Windows 10 to replaces Windows Phone - Microsoft's previous mobile OS. Windows 10 also integrates other Microsoft services, such as Xbox Live and the Cortana voice recognition assistant.

3.10 Technologies Used

Html

HTML is the standard markup language for creating web pages and web applications.HTML is used to structure the content of a web page using a system of elements and tags. These elements represent various types of content such as text, images, links, forms, and multimedia. Each element is enclosed in angle brackets ¿¿ and typically consists of a start tag, content, and an end tag.

Javascript

JavaScript is a high-level programming language commonly used for creating dynamic and interactive websites. It is one of the core technologies of web

development, along with HTML (Hypertext Markup Language) and CSS (Cascading Style Sheets).

CSS

CSS, or Cascading Style Sheets, is a style sheet language used to describe the presentation of a document written in HTML or XML. CSS defines how HTML elements are displayed on screen, in print, or in other media types.

Bootstrap

Bootstrap is a popular front-end framework for building responsive and mobile-first websites. It provides a set of pre-designed HTML, CSS, and JavaScript components and utilities that developers can use to create consistent and visually appealing web interfaces quickly.

What distinguishes PHP from something like client - side Javascript is that the code is executed on the server, generating HTML which is then sent to the client. The client would receive the results of running that script, but would not know what the underlying code was. You can even configure your web server to process all your HTML files with PHP, and then there's really no way that users can tell what you have up your sleeve. The best things in using PHP are that it is extremely simple for a newcomer, but offers many advanced features for a professional programmer.

STUDENT RESULT ANALYSIS SYSTEM

PROJECT REPORT

Submitted By

AMAL JOE

Reg.No. CCAVSCS021

for the award of the Degree of

Bachelor of Science (B.Sc.)

in Computer Science
(University of Calicut)

under the guidance of

Mr.Thoufeeq Ansari

Assistant Professor

BSc. COMPUTER SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE(Autonomous)
IRINJALAKUDA, KERALA
INDIA

March 2024

DEPARTMENT OF COMPUTER SCIENCE

CHRIST COLLEGE (AUTONOMOUS)

IRINJALAKUDA

CERTIFICATE

This is to certify that the project report entitled "*Student result analysis system* "record of the project work done by **Amal Joe** in partial fulfillment of the requirement for the sixth semester of **Bachelor of Computer Science** in Department of Computer Science of **CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

Mr.Thoufeeq Ansari
Assistant Professor,CS
Internal Guide

Ms. Sini Thomas
Head of the Department
Computer Science

EXTERNAL EXAMINER

INTERNAL EXAMINER

DECLARATION

I hereby declare that this project work **"STUDENT RESULT ANAL-YSIS SYSTEM"** submitted to Christ College (Autonomous) Irinjalakuda, affiliated to Calicut University in partial fulfillment of the requirement for the award of the Bachelor of Computer Science, is a record of original work done by us, under the guidance of Ms.THOUFEEQ ANSARI, Department of computer Science.

Place: Irinjalakuda

AMAL JOE

ACKNOWLEDGEMENT

ABSTRACT

STUDENT RESULT ANALYSIS SYSTEM is a web site design. This application used for the analyzing the student results according to the user requirements and generate the performance report of student, subject or branch. It also allows the student to see their individual performance in semester. this will help the college management to take the appropriate actions to improve the quality of education and helps in improving the performance of students. Resource-related results analysis is one variation of results analysis

Contents

Chapter 1

1 Introduction

Student Result Analysis System is a web site design. This website used for the analysing the students results according to the user requirements. It also allows the student to see their individual performance in semester. this will help the college management to take the appropriate actions to improve the quality of education and helps in improving the performance of students. In this Result Analysis System there are four login. Admin login ,Staff login, HOD login and Student login. Admin login can add HOD, Staff, Student, Course, Subject, Session and also manage them all. Staff login can add result, edit result, view result and compare the results. HOD login can compare results between classes. Student login can view result and compare results. This system has been designed to carry out the mark analysis process in an educational institution. Now a day result analysis and comparison is done manually by taking lots of effort and time. This system is a solution for such problems.

1.1 Overview

Student Result Analysis System is a web site which designed by using python and django. This website used for the analysing the student results according to the user requirements and generate the statistical graph.

Chapter 2

2   System Analysis

2.1   Purpose

The student results analysis system project aims to create a user-friendly system for educational institutions to manage and analyse student performance. In this Result Analysis System there are four login. Admin login ,Staff login, HOD login and Student login. Admin login can add HOD, Staff, Student, Course, Subject, Session and also manage them all. Staff login can add result, edit result, view result and compare the results. HOD login can compare results between classes. Student login can view result and compare results. It store and manage students information, including personal details and academic records. Analysing student performance across various subjects, semesters, or academic periods. Allowing students, teachers, and administrators to track students and batch progress over time. Generating statistical reports and charts to visualize trends and patterns in student performance. Presenting data in a visually appealing and easy-to-understand format, such as graphs, charts, and tables.

2.1.1   Existing System

An existing system for student result analysis typically involves software or a platform designed to efficiently manage and analyze students academic performance.

2.1.2   Proposed System

Student Result Analysis System is an student driven system that is designed in order to keep record of student data by use of technology. Now-a-day result analysis is done manually taking lots of effort and time then too desired accuracy is not achieved. Also updation of data is very difficult as all data needs to revised again. In addition more paperwork and documentation is required.

2.2   Problem definition

Inefficiency in Result Management: Manual processes for entering and managing student results lead to inefficiencies, errors, and delays in updating academic records.

Limited Data Analysis Capabilities: Existing systems may lack robust tools for analyzing student performance data, hindering educators' ability to identify trends, patterns, and areas for improvement.

Lack of Insightful Reporting: Current reporting mechanisms may provide basic information but fail to deliver actionable insights that can guide decision-making and instructional planning.

Communication Gaps: Inadequate communication channels between teachers, students, and parents/guardians may hinder timely feedback on academic progress and performance.

Data Security and Privacy Concerns: With increasing reliance on digital platforms, ensuring the security and privacy of student data becomes paramount to comply with regulations and safeguard sensitive information.

Scalability Issues: Existing systems may struggle to scale effectively to accommodate growing student populations or evolving educational requirements.

2.3   Feasibility study

After the problem is clearly understood and solutions proposed, the next step is to conduct the feasibility study. Feasibility study is defined as evaluation or analysis of the potential impact of the proposed project or program. The objective is to determine whether the proposed system is feasible. There are three aspects of feasibility study to which the proposed system is subjected as discussed below.

2.3.1   Technical Feasibility

Technical feasibility assess whether the current technical resources are sufficient for the new system. We can upgrade the level of technology for supporting our website. We check whether the proposed system can be implemented in the present system without supporting the existing hardware.

2.3.2   Economical Feasibility

Economic feasibility determines whether the time and money are available to develop the system. There is no additional hardware used to develop the site, it is inexpensive to build.

2.3.3   Operational Feasibility

Operational feasibility determines if the human resources are available to operate the system once it has been installed. No extra training is needed to use this system. Anyone who has knowledge in internet in english language can easily use the system. The resources that are required to implement or install are already available with the organization.

Chapter 3

3 Software Requirement Specification

3.1 Purpose

The main purpose of the project is to streamline the process of gathering, organizing, and presenting student academic data. It aims to offer insights into individual and group performance, identify areas of improvement, and enable effective academic planning.

3.2 Scope

User authentication: Secure login and access control for administrators, teachers, and students. Result management: Uploading, storing, and organizing student results in a database. Dashboard: Displaying visualizations and summaries of student performance and class-wise statistics. Individual student analysis: Providing detailed performance reports for each student Class analysis: Comparative analysis of class-wise performance and subject-wise trends.

3.3 Overall Description

Student result analysis is a web site developed for colleges to analyze the results of student. For students it is easy to check the result, it will simply enter their email id and password. It store and manage students information, including personal details and academic records. Analysing student performance across various semesters, or academic periods. Allowing students, teachers, and administrators to track students and batch progress over time.

3.3.1 Product Perspective

The product perspective of a student result analyzer project involves considering its functionality, usability, and integration with existing systems.

3.3.2 Product Functionality

The student result analyzer should be able to efficiently process and analyze student results from various subjects and semesters. It should calculate marks and display statistic graphs.

3.3.3 Users and Characteristics

There are four types of users that interact with the site admin, Staffs,HOD and Students. Each of these have different tasks which is performed. Admin login can add HOD, Staff, Student, Course, Subject, Session and also manage them all. Staff login can add result, edit result, view result and compare the results.

STUDENT RESULT ANALYSIS SYSTEM

PROJECT REPORT

Submitted By

ARUN K J

Reg. No. CCAVSCS022

for the award of the Degree of

Bachelor of Science (B.Sc.)

in Computer Science
(University of Calicut)

under the guidance of

Mr. Thoufeeq Ansari

Assistant Professor

BSc. COMPUTER SCIENCE
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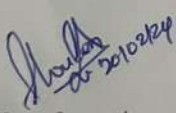**CHRIST COLLEGE(Autonomous)**
IRINJALAKUDA, KERALA
INDIA

March 2024

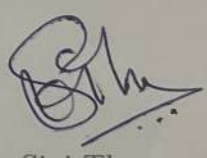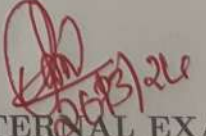# DEPARTMENT OF COMPUTER SCIENCE

CHRIST COLLEGE (AUTONOMOUS)

IRINJALAKUDA

CERTIFICATE

This is to certify that the project report entitled ” **STUDENT RESULT ANALYSIS SYSTEM** ” *is a bonfied record of the project work done by* **ARUN KJ** *in partial fulfillment of the requirement for the sixth semester of* **Bachelor of Computer Science** *in Department of Computer Science of* **CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA.**

Mr.Thoufeeq Ansari
Assistant Professor,CS
Internal Guide

Ms. Sini Thomas
Head of the Department
Computer Science

26/3/2024

EXTERNAL EXAMINER

INTERNAL EXAMINER

DECLARATION

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Place: Irinjalakuda   ARUN K J

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STOCK PRICE PREDICITON

PROJECT REPORT

Submitted By

ARYAN M ANAND

Reg. No. CCAVSCS023

Bachelor of Science (B.Sc.)

in Computer Science
(University of Calicut)

under the guidance of

Ms. Sini Thomas

Head Of the Department

**B.Sc. COMPUTER SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE
IRINJALAKUDA, KERALA**
March 2024

DEPARTMENT OF COMPUTER SCIENCE

CHRIST COLLEGE (AUTONOMOUS)

IRINJALAKUDA

CERTIFICATE

This is to certify that the project report entitled *"Stock Price Prediction"* is a bonafide record of the project work done by **Aryan M Anand** in partial fulfillment of the requirement for the sixth semester of **Bachelor of Computer Science** in Department of Computer Science of **CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

Ms. Sini Thomas
Head Of the Department
Internal Guide

Ms. Sini Thomas
Head Of the Department
Computer Science

26/03/2024

26/03/24.

EXTERNAL EXAMINER

INTERNAL EXAMINER

DECLARATION

I hereby declare that this project work **"STOCK PRICE PREDIC-
TION"** submitted to Christ College (Autonomous) Irinjalakuda, affiliated
to Calicut University in partial fulfillment of the requirement for the award
of the Bachelor of Computer Science, is a record of original work done by
me, under the guidance of Ms. SINI THOMAS, Department of computer
Science.

PLACE : IRINJALAKUDA   ARYAN M ANAND

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First and foremost I would like to thank Lord almighty for his providence and for being the guiding light throughout the project. I wish to express sincere gratitude to my beloved Department head for giving me all the facilities for my project. I take this opportunity to express gratitude to my class teacher Ms. RASMI P.M , my scholar hub guide PRIYANGA K.K and my Head Of the Department Ms. SINI THOMAS who has supported me throughout the course of this project. I am thankful for her aspiring guidance and valuable advice during the project work. I express sincere thanks to my project guide Ms. SINI THOMAS for supporting and guiding throughout the project. I would take this opportunity to specially thank all other faculty members for their constant and continuous motivation. Finally I would like to thank my family and friends for giving valuable advice and moral support throughout my project.

ABSTRACT

STOCK PRICE PREDICITION is a system that aims to predict the future value of the financial stocks of a market.The recent trend in stock market prediction technologies is to use of machine learning which makes predictions based on the values of current stock market indices by training on their previous values. Machine learning itself employs different models to make predictions easier and authentic. This documentation focuses on the use of LSTM- LONG SHORT TERM MEMORY based Machine learning to predict stock values. Factors considered are open,close,low,high,adjacent value and volume.

Contents

Chapter 1

1   INTRODUCTION

The world of finance has long been captivated by the elusive quest for accurate stock prediction. In recent years, advancements in technology and data analytics have revolutionized this pursuit, offering unprecedented opportunities for investors and researchers alike. This project delves into the realm of stock prediction, employing cutting-edge machine learning algorithms and statistical techniques to forecast the future movements of various stocks. By analyzing historical data, market trends, and a plethora of other factors, this report aims to provide a comprehensive overview of the methodologies, challenges, and outcomes associated with stock prediction in today's dynamic financial landscape. Through meticulous analysis and interpretation, this study endeavors to shed light on the complexities of stock markets and offer insights that can inform decision-making processes for investors and financial institutions Accurate prediction of stock prices plays an increasingly prominent role in the stock market where returns and risks fluctuate wildly, and both financial institutions and regulatory authorities have paid sufficient attention to it. As a method of asset allocation, stocks have always been favored by investors because of their high returns. The research on stock price prediction has never stopped. In the early days, many economists tried to predict stock prices. Later, with the in-depth research of mathematical theory and the vigorous development of computer technology, people have found that the establishment of mathematical models can be very good, such as time series model, because its model is relatively simple and the forecasting effect is better. Time series model is applied in a period of time The scope gradually expanded. However, due to the non-linearity of stock data, some machine learning methods, such as support vector machines. Later, with the development of deep learning, some such as RNN, LSTM neural Networks, they can not only process non-linear data, but also retain memory for the sequence and retain useful information, which is positive. It is required for stock data forecasting. This article introduces the theoretical knowledge of time series model and LSTM neural network, and select real stocks in the stock market, perform modeling analysis and predict stock prices, and then use the root mean square error to compare the prediction results of several models. Since the time series model cannot make good use of the non-linear part of the stock data, can't perform long-term memory, and LSTM neural network makes better use of non-linear data and has better use of sequence data. Useful information in the long-term memory, which makes the root mean square error of the prediction result, the LSTM neural network needs smaller than the time series model, indicating that LSTM neural network is a better stock price forecasting method. The time series for stock prices belong to non-stationary and non-linear data, making the prediction of future price trends extremely challenging. In order to learn the long-term dependence of stock prices, deep learning methods such as the LSTM method are used to obtain longer data dependence and overall

change patterns of the stocks.

1.1 Overview

The objective of stock price predictions is to provide investors and traders with insights into potential future movements in stock prices, enabling them to make informed decisions. By analyzing historical data and employing various statistical and machine learning techniques, stock price prediction models aim to forecast the direction and magnitude of price changes over different time horizons. These predictions serve several purposes, including guiding investment decisions, managing risk, optimizing portfolios, and devising trading strategies. Ultimately, the goal is to leverage predictive analytics to enhance financial decision-making and achieve desired investment outcomes in dynamic and uncertain market

1.2 Stock Market

A stock market, equity market or share market is the aggregation of buyers and sellers (a loose network of economic transactions, not a physical facility or discrete entity) of stocks (also called shares), which represent ownership claims on businesses; these may include securities listed on a public stock exchange as well as those only traded privately. Examples of the latter include shares of private companies which are sold to investors through equity crowd funding platforms. Stock exchanges list shares of common equity as well as other security types, e.g. corporate bonds and convertible bonds. Stock price prediction is one of the most widely studied problem, attracting researchers from many fields. The volatile nature of the stock market makes it really difficult to apply simple time-series or regression techniques. Financial institutions and active traders have created various proprietary models to beat the market for themselves or their clients, but rarely did anyone achieve consistently higher than the average returns on investment. The challenge of stock market price forecasting is so appealing because an improvement of just a few points of percentage can increase the profit by millions of dollars. This paper discusses the application of Support Vector Machines and Linear Regression in detail along with the pros and cons of the given methods.

1.3 LSTM - Long Short Term Memory

LSTM networks are an extension of recurrent neural networks (RNNs) mainly introduced to handle situations where RNNs fail.

- It fails to store information for a longer period of time. At times, a reference to certain information stored quite a long time ago is required to predict the current output. But RNNs are absolutely incapable of handling such "long-term dependencies".

- There is no finer control over which part of the context needs to be carried forward and how much of the past needs to be 'forgotten'.

- Other issues with RNNs are exploding and vanishing gradients (explained later) which occur during the training process of a network through back-tracking.

Thus, Long Short-Term Memory (LSTM) was brought into the picture. It has been so designed that the vanishing gradient problem is almost completely removed, while the training model is left unaltered. Long-time lags in certain problems are bridged using LSTMs which also handle noise, distributed representations, and continuous values. With LSTMs, there is no need to keep a finite number of states from beforehand as required in the hidden Markov model (HMM). LSTMs provide us with a large range of parameters such as learning rates, and input and output biases.

1.4 Time Series Model

Stationary time series are divided into strictly stationary time series and wide stationary time series. Below we introduce their definitions. Strictly stationary time series provide important theoretical significance, but it is difficult to obtain the joint distribution of random sequences in the actual research process. Therefore, in order to better use in practical applications, researchers have defined a relatively weak wide stationary time sequence. Researchers choose to use the characteristic statistics of the sequence to define wide stationarity, which can make the constraint conditions a little looser. By ensuring the stationarity of the low-order moments of the sequence to ensure that the sequence can be approximately stationary. Time series analysis also belongs to the field of statistics. It can also analyze the population through samples like statistics. And from the statistical theorems, we can know that the number of random variables is directly proportional to the complexity of the analysis, and the sample size is inversely proportional to the accuracy of obtaining the overall information (obviously the sample information obtained when the population is selected as the sample is Overall information, but such an operation is obviously unrealistic). But time series data has its peculiarities. For a time series $\cdots$, X1, X2, $\cdots$, Xt, $\cdots$, its value Xt at any time t is a random variable, and since time is one-way, it cannot be repeated , So we can only get one sample value in this way, which leads to too little sample information for statistical analysis. But if we have the concept of stationarity, this problem will be solved.

Chapter 2

2 SYSTEM ANALYSIS

2.1 Purpose

The main purpose of stock price predictions is to assist investors and traders in making informed decisions about buying, selling, or holding stocks. These predictions aim to provide insights into the potential future movements of stock prices, helping individuals and institutions navigate the complexities of the financial markets and optimize their investment strategies

2.1.1 Existing System

The existing system for stock price prediction typically involves traditional statistical methods, such as moving averages, ARIMA (AutoRegressive Integrated Moving Average), and other time series forecasting techniques. These methods often rely on historical price data and assume certain patterns in the data to make predictions. Limitations of Existing System: The traditional methods may struggle to capture complex patterns and dependencies present in financial time series data.

2.1.2 Proposed System

The proposed system is to use LSTM for prediction. The limitation of the existing system is overcome by LSTM, a type of recurrent neural network (RNN). LSTM is particularly effective for handling long-range dependencies and capturing intricate patterns in sequential data, making it well-suited for stock price prediction. Advantages of Proposed System : LSTM-based models can learn from historical data with memory capabilities, allowing them to adapt to changing market conditions and capture subtle trends that may not be evident with simpler techniques.

2.2 Problem definition

To know what the problem is and what the needs are before developing it. Here we design a model to predict the stock price of a market.

2.3 Feasibility Study

After the problem is clearly understood and solutions proposed, the next step is to conduct the feasibility study. Feasibility study is defined as evaluation or analysis of the potential impact of the proposed project or program. The objective is to determine whether the proposed system is feasible. There are three aspects of feasibility study to which the proposed system is subjected as discussed below.

C-JOBS

PROJECT REPORT

Submitted By

ATHUL T.S

Reg. No. CCAVSCS024

for the award of the Degree of

Bachelor of Science (B.Sc.)

in Computer Science
(University of Calicut)

under the guidance of

Mr.Linto George

Assistant Professor

BSc. COMPUTER SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE(Autonomous)
IRINJALAKUDA, KERALA
INDIA

March 2024

DEPARTMENT OF COMPUTER SCIENCE

CHRIST COLLEGE (AUTONOMOUS)

IRINJALAKUDA

CERTIFICATE

This is to certify that the project report entitled **"C-JOBS"** *is a bonfied record of the project work done by* **Athul T.S** *in partial fulfillment of the requirement for the sixth semester of* **Bachelor of Computer Science** *in Department of Computer Science of* **CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

Mr.Linto George
Assistant Professor,CS
Internal Guide

Ms. Sini Thomas
Head of the Department
Computer Science

26/3/24

EXTERNAL EXAMINER

INTERNAL EXAMINER

DECLARATION

    I hereby declare that this project work **"C-JOBS"** submitted to Christ College (Autonomous) Irinjalakuda, affiliated to Calicut University in partial fulfillment of the requirement for the award of the Bachelor of Computer Science, is a record of original work done by me under the guidance of Mr.LINTO GEORGE, Department of computer Science.

Place: Irinjalakuda

                                       ATHUL T.S

ACKNOWLEDGEMENT

First and foremost I like to thank Lord almighty for his providence and for being the guiding light throughout the project. I wish to express my sincere gratitude to our beloved Department head for giving me all the facilities for our project. I take this opportunity to express my gratitude to the class teacher Ms. RASMI P.M and head of the department Ms. SINI THOMAS who has been supported me throughout the course of this project. I thankful for her aspiring guidance and valuable advice during the project work.I express my sincere thanks to my project guide Mr.LINTO GEORGE for supporting and guiding throughout the project.I would take this opportunity to specially thank all other faculty members for their constant and continuous motivation. Finally I would like to thank my family and friends for giving valuable advice and moral support throughout my project.

ABSTRACT

C-JOBS is a innovative website introduced to manage and automates the placement procedures at Christ College(Autonomous) Irinjalakuda. The website is enriched with three kind of login facilities - admin login, student login, faculty login.,The portal allows students to explore job vacancies, apply for jobs, view training programs, and access various study materials. Faculty members, designated as administrators, have the authority to manage students, faculty, courses, departments, jobs, placed students, and training programs. All these features make this website more adaptable and user-friendly.

Contents

Chapter 1

1 Introduction

The C-JOBS project is a software application designed to streamline and automate the process of managing placements for students in educational institutions. C-JOBS is designed to help students for applying jobs. It will help to apply for the job were they fit in . This project helps the training and placement officers to overcome the difficulty in keeping records of hundreds and thousands of students and searching the eligible students for recruitment, based on various eligibility criteria of different companies .This enables you to plan placements, train students in accordance with relevant market demands, organize placement drives, and allow companies to recruit students.

1.1 Overview

The main objective of the C-JOBS is to manage the details of the Student and Placement Cell, to reduce manual work and time. This project is a Python Django-based web application for managing a college job portal. The portal allows students to explore job vacancies, apply for jobs, view training programs, and access various study materials. Faculty members, designated as administrators, have the authority to manage students, faculty, courses, departments, jobs, placed students, and training programs.

Chapter 2

2 System Analysis

2.1 Purpose

The main purpose of this website is to create a website of Placement Management System which is owned by Placement cell. The benefit of this website is very high because the college can use this website for a well maintained Placement Management System.

2.1.1 Existing System

The traits of the earlier working model and their drawback are described in the existing system. The existing system does all processes manually. Placement officers record the data of students. If any alterations or updates are necessary in the profile of any student, it has to be done manually. This is tedious and time-consuming, lacks the security of data, took more manpower, consumes a large volume of paper and space. When the number of users increases, then this method is very problematic. In the previous system placement officer has to collect student details for placements. Approving those student details takes a lot of time. Implementing a digital placement management system can automate and streamline these processes, making them more efficient, transparent, and accessible to all stakeholders involved.

2.1.2 Proposed System

The proposed system can overcome all the limitations of the existing system, such as student's information is maintained in the database, it gives more security to data, ensures data accuracy, reduces paper work and save time, it makes information flow efficient and paves way for easy report generation, reduce the space, proposed system is cost effective. Placed student details, reviews and other statistic information will be displayed. Filtering student profiles based on companies requirements. It is easy for students to get information of newer placement programs. Students can explore job vacancies, view detailed listings, apply online, and upload their resumes and they can view and access available training programs to enhance their skills. The portal provides access to various study materials to support student learning.

2.2 Problem definition

To know what the problem is and what the needs are before developing it. Here we design a website of C-JOBS for maintaining Placement Procedure. Students choose a specific college where the placement will be held, there is a need to maintain all these papers, causing large amount of space. It is manually done, chances of missing, difficult to handle the details of student.

2.3 Feasibility Study

After the problem is clearly understood and solutions proposed, the next step is to conduct the feasibility study. Feasibility study is defined as evaluation or analysis of the potential impact of the proposed project or program. The objective is to determine whether the proposed system is feasible. A feasibility study for a placement managment system project might include schedule feasibility and economical feasibility.The schedule feasibility might include ,How likely the project is to be completed within its proposed time frame and the economical feasibility. A check for the high investment incurred for the system.There are three aspects of feasibility study to which the proposed system is subjected as discussed below.

2.3.1 Technical Feasibility

Technical feasibility assess whether the current technical resources are sufficient for the new system. We can upgrade the level of technology for supporting our website. We check whether the proposed system can be implemented in the present system without supporting the existing hardware.

2.3.2 Economical Feasibility

Economic feasibility determines whether the time and money are available to develop the system. There is no additional hardware used to develop the site, it is inexpensive to build.

2.3.3 Operational Feasibility

Operational feasibility determines if the human resources are available to operate the system once it has been installed. No extra training is needed to use this system. Anyone who has knowledge in internet in English language can easily use the system. The resources that are required to implement or install are already available with the organization.

Chapter 3

3 Software Requirement Specification

3.1 Purpose

The purpose of this document is to give a detailed description of the requirements for the website of C-JOBS. It illustrates the purpose and complete description for the development of the system. It explains system constraints, interface and interactions with other external applications. This document is primarily intended to be proposed to a college for maintaining placement cell. The C-JOBS is a software solution that helps colleges and companies manage their hiring and recruitment processes.

3.2 Scope

The project has a wide scope. Our project mainly helps in improving productivity and makes use of utilization of resources. There is no duplication of work as this was not the case when done manually. Thus it reduces labor and increases morale. The system intends userfriendly operations which may resolve ambiguity. The project is a total management and informative system, which provides the up- to-date information of all the students in the college. Our system also help the college to overcome the difficulty in keeping records of hundreds of students and searching for a student eligible for recruitment criteria from the whole thing. It helps in effective and timely utilization of resources. The project facilitates userfriendly, reliable and fast management system. The placement officer itself can carry out operations in a smooth and effective manner. They need not concentrate on record keeping. The college can maintain computerized records thus reducing paper work, time and money . We can get all information about the placement cell by having a look at this website.

3.3 Overall Description

This section give an overview of our website, C-JOBS.The main objective of the placement management system is to reduce manual work and time. It is difficult and time-consuming to collect all the details from each student. To avoid this problem we have planned to develop a web-based placement management system. This project is designed for managing placement cell. The portal allows students to explore job vacancies, apply for jobs, view training programs, and access various study materials. Faculty members, designated as administrators, have the authority to manage students, faculty, courses, departments, jobs, placed students, and training programs. Student, admin and teachers are also getting equal participation in uploading unique functions in it and also separate login is also provided.

WITH YOU
MENTAL HEALTH TRACKER

PROJECT REPORT

Submitted By

EBIN JOSHY

Reg. No. CCAVSCS025

for the award of the Degree of

Bachelor of Science (B.Sc.)

in Computer Science
(University of Calicut)

under the guidance of

Ms. Rasmi P M

Assistant Professor

BSc. COMPUTER SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE(Autonomous)
IRINJALAKUDA, KERALA
INDIA

March 2024
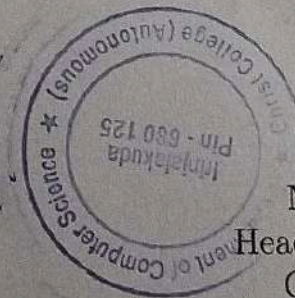
DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE (AUTONOMOUS)
IRINJALAKUDA

CERTIFICATE

This is to certify that the project report entitled *"With You - Mental Health Tracker"* is a bonfied record of the project work done by **Ebin Joshy** in partial fulfillment of the requirement for the sixth semester of **Bachelor of Computer Science** in Department of Computer Science of CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA.

Ms. Rasmi P M
Assistant Professor,CS
Internal Guide

Ms. Sini Thomas
Head of the Department
Computer Science

26/03/2024

EXTERNAL EXAMINER

INTERNAL EXAMINE

DECLARATION

I hereby declare that this project work "**WITH YOU - MENTAL HEALTH TRACKER**" submitted to Christ College (Autonomous) Irinjalakuda, affiliated to Calicut University in partial fulfillment of the requirement for the award of the Bachelor of Computer Science, is a record of original work done by us, under the guidance of Ms. RASMI P M, Department of Computer Science.

Place: Irinjalakuda

EBIN JOSHY

ACKNOWLEDGEMENT

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ABSTRACT

MENTAL HEALTH TRACKER APP application aims to empower users to monitor their mental health status, track mood fluctuations, identify potential triggers, and access resources for support. Key features include mood tracking, and personalized recommendations based on user input and behavioral patterns. Utilizing data analytics and machine learning algorithms, the application will offer insights into users' mental health trends over time, enabling them to make informed decisions regarding self-care and seek professional help if needed.

Contents

Chapter 1

1 Introduction

Welcome to our project on mental health tracking! In an increasingly digitized world, our focus turns to leveraging technology for mental well-being. Our app aims to provide a holistic approach to mental health monitoring, offering users a user-friendly interface to track their emotional states, access resources, and cultivate healthier habits. Join us on this journey to promote mental wellness through innovation.

1.1 Overview

Our project aims to bridge the gap between technology and mental well-being. At its core, our project revolves around the development of a comprehensive mental health tracker app. This app serves as a multifaceted tool designed to empower users in various aspects of their mental wellness journey. our goal is to harness the power of computer science to create a positive impact on mental health outcomes. By empowering individuals to take proactive steps towards better mental well-being, we strive to contribute to a healthier and more resilient society.

Chapter 2

2 System Analysis

2.1 Purpose

A mental health tracker app developed through a computer science project serves to provide users with tools to monitor and manage their mental well-being. It can include features like mood tracking, journaling, coping strategies, and resources for support. The app aims to promote mental health awareness, offer insights into patterns and triggers, and encourage users to seek professional help when needed.

2.1.1 Existing System

The existing system of a mental health tracker app typically involves features like mood tracking and sometimes reminders for medication or therapy session. Users can log their emotions, and thoughts to gain insights into their mental well-being over time. Some apps also offer resources like coping strategies, relaxation techniques, and mental health assessments. The data collected can be used to identify patterns, triggers, and progress in managing mental health.

2.1.2 Proposed System

The proposed system is an android application that tracks the mental health of a person. This app will help to the patient to improve their mental condition and encourages them to enjoy life and helps them to stay always positive. In this model aims to identify, analyse and characterize the current state of person. The application was created based on interaction between patient and the smart device to connect with psychologist. In this model, mental screening questionnaires includes sentiment analysis which are there for tracking mood and mental condition more precisely. This model helps rationalize negative thoughts.

2.2 Problem definition

In an era where mental health awareness is paramount, there exists a need for accessible, user-friendly, and effective tools to support individuals in monitoring and managing their mental well-being. The problem at hand is to comprehensively investigate and evaluate mental health tracker apps to determine their effectiveness in enhancing users' mental well-being, identify key features and design considerations that contribute to their usability and engagement, and explore their potential role in augmenting traditional mental healthcare delivery models.

2.3   Feasibility study

After the problem is clearly understood and solutions proposed, the next step is to conduct the feasibility study. Feasibility study is defined as evaluation or analysis of the potential impact of the proposed project or program. The objective is to determine whether the proposed system is feasible. There are three aspects of feasibility study to which the proposed system is subjected as discussed below.

2.3.1   Technical Feasibility

Technical feasibility assess whether the current technical resources are sufficient for the new system. We can upgrade the level of technology for supporting our website. We check whether the proposed system can be implemented in the present system without supporting the existing hardware.

2.3.2   Economical Feasibility

Economic feasibility determines whether the time and money are available to develop the system. There is no additional hardware used to develop the site, it is inexpensive to build.

2.3.3   Operational Feasibility

Operational feasibility determines if the human resources are available to operate the system once it has been installed. No extra training is needed to use this system. Anyone who has knowledge in internet in english language can easily use the system. The resources that are required to implement or install are already available with the organization.

Chapter 3

3 Software Requirement Specification

3.1 Purpose

The purpose of this document is to give a detailed description of the Requirements or the MENTAL HEALTH TRACKER APPLICATION . It illustrate the purpose and complete description for the development of the system. It explain system constraints, interface and interactions with other external applications. This document is primarily intended to help users monitor and manage their mental well being.

3.2 Scope

The scope of a Mental Health Tracker app encompasses various features and functionalities aimed at promoting self-awareness, supporting mental health management, and fostering well-being.

3.3 Overall Description

This section give an overview of our application, mental health tracker application. A mental health tracker app is a digital tool designed to help users monitor, manage, and improve their mental well-being. It typically offers a range of features and functionalities to support users in understanding and addressing their mental health concerns.

3.3.1 Product Perspective

A successful Mental Health Tracker app combines user-centric design principles, robust features, data privacy measures, interoperability, continuous improvement, and effective business strategies to deliver value to users and contribute to their mental well-being.

3.3.2 Product Functionality

The functionality of a Mental Health Tracker app is crucial in providing users with tools and features to monitor, manage, and improve their mental well-being.

3.3.3 Users and Characteristics

Mental Health Tracker app users encompass a diverse range of individuals, including those managing diagnosed conditions, seeking self-improvement, supporting others, or prioritizing holistic well-being. Psychological Experts can access the app and diagnose the users who are using the app.

3.4 Specific Requirements

3.4.1 Hardware Requirements

- System: Android 9 or above
- Processor: Snapdragon 650 or above
- RAM capacity: 4 GB
- Hard Disk drive: 40 GB

3.4.2 Software Requirements

- Operating System:Windows or ubuntu
- Languages used: Flutter, Node.js
- Database : MySql
- Technologies used: Flutter, Node.js

3.5 Functional Requirements

It contains three main modules.

- 1. Mental Health Assessment
- 2. Weekly Report
- 3. Sentiment Analysis

Mental Health Assessment

This module focuses on collecting and analyzing various data points related to the user's mental health. It may include features such as mood tracking, stress levels, sleep patterns, physical activity, and other relevant factors. The module will utilize algorithms and techniques to interpret this data, providing insights into the user's overall mental well-being.

Weekly Report

The Weekly Report module compiles the data gathered from the Mental Health Analysis module and presents it in a structured format. It provides users with a comprehensive overview of their mental health status throughout the week.

WriteWell

PROJECT REPORT

Submitted By

GOPIKA M S

Reg. No. CCAVSCS026

for the award of the Degree of

Bachelor of Science (B.Sc.)

in Computer Science
(University of Calicut)

under the guidance of

Ms. Vanadana T V

Assistant Professor

**BSc. COMPUTER SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE(Autonomous)
IRINJALAKUDA, KERALA
INDIA**

July 2021-2024

DEPARTMENT OF COMPUTER SCIENCE

CHRIST COLLEGE (AUTONOMOUS)

IRINJALAKUDA

CERTIFICATE

This is to certify that the project report entitled *"WriteWell"* is a bonafide record of the project work done by **Gopika M S** in partial fulfillment of the requirement for the sixth semester of **Bachelor of Computer Science** in Department of Computer Science of **CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

Ms. Vandana T V
Assistant Professor,CS
Internal Guide

Ms. Sini Thomas
Head of the Department
Computer Science

EXTERNAL EXAMINER

INTERNAL EXAMINER

DECLARATION

I hereby declare that this project work "**WriteWell**" submitted to Christ College (Autonomous) Irinjalakuda, affiliated to Calicut University in partial fulfillment of the requirement for the award of the Bachelor of Computer Science, is a record of original work done by us, under the guidance of Ms. VANDANA T V, Department of computer Science.

Place: Irinjalakuda

GOPIKA M S

ACKNOWLEDGEMENT

First and foremost I like to thank Lord almighty for his providence and for being the guiding light throughout the project. I wish to express my sincere gratitude to our beloved Department head for giving me all the facilities for our project. I take this opportunity to express my gratitude to the class teacher Ms. RASMI P M and head of the department Ms. SINI THOMAS who has been supported us throughout the course of this project. I are thankful for her aspiring guidance and valuable advice during the project work. I express my sincere thanks to my project guide Ms. VANADANA T V for supporting and guiding throughout the project.I would take this opportunity to specially thank all other faculty members for their constant and continuous motivation. Finally I would like to thank my family and friends for giving valuable advice and moral support throughout our project.

ABSTRACT

WriteWell aims to provide users with a versatile linguistic toolset, offering the ability to translate text, PDF documents, audio files, and images. The platform incorporates multiple functionalities, including translation services powered by APIs such as Google Cloud Translation or Microsoft Translator. Users can seamlessly input text, upload PDFs, audio files, or images, receiving accurate translations in return. Furthermore, the web app incorporates a grammar checker to enhance the quality of written content. The grammar checker feature helps users refine their text by identifying and suggesting corrections for grammatical errors. This ensures that the translated content maintains a high standard of language accuracy.

In addition to translation and grammar checking, the web app includes an English grammar quiz chatbot. This interactive feature engages users in a quiz format, assessing their understanding of English grammar rules. The chatbot provides instant feedback and explanations, contributing to a dynamic and educational user experience.

Overall, this web application serves as a comprehensive linguistic tool, combining translation capabilities, grammar checking features, and an interactive grammar quiz chatbot to cater to diverse language-related needs.

Contents

Chapter 1

1 Introduction

Embark on a linguistic odyssey with our state-of-the-art web application, a versatile and all-encompassing tool that redefines the way we communicate. Offering a suite of features that spans text, audio, image, and PDF translation, our platform goes above and beyond by incorporating a sophisticated grammar checker. More than a mere translation aid, this web application becomes your linguistic companion, facilitating a nuanced and polished communication experience across various mediums. Amidst the myriad of language-related challenges, our grammar checker emerges as a beacon of precision. It meticulously analyzes your written content, ensuring grammatical excellence and elevating the quality of your expression. This innovative feature goes beyond traditional language tools, providing users with a holistic solution for enhancing both translation accuracy and grammatical finesse. Providing a q/a chatbot about english grammar which helps the user to improve their english language skill. In a world where effective communication is paramount, our web application stands as a testament to technological innovation. Join us in exploring the seamless integration of translation and grammar checking, creating a unique synergy that sets this platform apart. Elevate your communication game and unlock a new realm of linguistic prowess with our web application—an embodiment of precision, clarity, and excellence in the art of expression.

1.1 Overview

The objective of the Writewell is to Develop a system which able to do conversation between the languages . It will provide fast and accurate feedback on the quality of the user's writing . And also to support multiple languages , and adapt to the user's preferences and needs.It is used for solving every queries to user about the grammar of the language. It will help the user to learn different language . a linguistic marvel designed to reshape how we interact with language. Boasting an array of features that span text, audio, image, and PDF translation, our platform takes communication to the next level by incorporating an advanced grammar checker. This tool, far more than a translation companion, becomes your guide to refined expression, ensuring not only accurate translation but also grammatical excellence. The grammar checker, a standout feature, meticulously refines your written content, elevating it to a new standard of clarity. Finally a chatbot that helps your english skill by providing grammar quiz.This integration of translation and grammar checking offers users a comprehensive solution, addressing the diverse linguistic challenges faced in our interconnected global landscape.it involves perfecting the nuances of expression. With our web application, witness the seamless synergy of translation and

grammar enhancement, unlocking a realm of precision, clarity, and excellence in communication.

Chapter 2

2 System Analysis

2.1 Purpose

The web application has been meticulously crafted with a multifaceted purpose, aspiring to redefine and elevate the user experience in effective communication across a spectrum of mediums. Its expansive repertoire of features encompasses not only text, audio, image, and PDF translation but also introduces an advanced grammar checker and a quiz chatbot, distinguishing it as a comprehensive language tool. Beyond the conventional boundaries of translation, this integrated grammar checker is designed to ensure not just linguistic accuracy but also grammatical excellence,the chatbot helps the individual to improve their english grammar, reflecting the platform's commitment to refining written expression.

In addressing the diverse needs of users, the web application emerges as a holistic language solution, seamlessly navigating personal, academic, and professional spheres. The versatility embedded in its design enables users to adapt the application to various linguistic challenges, positioning it as an adaptive and indispensable tool. This innovative approach to communication technology sets the platform apart, ushering in a new era where precision, clarity, and linguistic proficiency converge.

Furthermore, the web application serves as a catalyst for global connectivity, facilitating effective communication in our interconnected world. By prioritizing accessibility and understanding across different languages and cultural contexts, the platform becomes a bridge for fostering meaningful connections. In summary, the web application transcends conventional boundaries, presenting itself as a transformative language companion that not only breaks down language barriers but also enriches the quality of expression in our dynamic and interconnected global landscape.

2.1.1 Existing System

Presently there are lot of grammer checker applications and translation applications .In all of those systems it takes the text input given by the user and clear all the grammar mistake that are present in the sentence/paragraph and paraphrase . The whole sentence/paragraph is converted into different form that is perfect to use in an official content . Even though they are using many machine learning algorithms , Optical character recognition , N-Gram and sequence to sequence are the main algorithm that are used in these . The existing system likely includes basic language translation features for text and, possibly, audio. It might lack the integration of advanced grammar checking capabilities, focusing primarily on straightforward translation services. The range of supported

mediums such as images and PDFs might be limited compared to the proposed system.

Furthermore, the user interface and overall user experience in the existing system might not be as streamlined and versatile. It might lack certain functionalities that enhance user convenience and adaptability across different linguistic scenarios.

In terms of global connectivity, the existing system may not prioritize cultural nuances and diverse language contexts as comprehensively as the proposed system. It might lack features that address the specific challenges associated with refined communication in an interconnected world

In essence, the existing system, which may have served adequately in its time, is likely to lack some of the innovative features and capabilities introduced by the proposed system. The proposed system aims to overcome these limitations by offering a more comprehensive, versatile, and refined language solution for users.

2.1.2   Proposed System

Compared to existing system we are also using the same machine learning algorithms for our system . We are trying to combine all the functions provided by the grammar checking web apps and translation apps into a single window that makes our system user-friendly We can use it as a language guide for travelers ,students ,employees etc The proposed system is a comprehensive and innovative web application designed to redefine language interaction and communication. This dynamic platform encompasses a range of features, including text, audio, image, and PDF translation, aiming to facilitate seamless understanding across diverse mediums. Notably, the system distinguishes itself by incorporating an advanced grammar checker.There is a chatbot which helps to improve our english language to which elevating it beyond traditional translation tools and emphasizing the importance of grammatical precision in communication.

At its core, the proposed system seeks to address the evolving needs of users in personal, academic, and professional spheres. The versatility embedded in its design allows users to navigate various linguistic challenges, providing a holistic language solution. The integration of a grammar checker stands as a testament to the system's commitment to refining written expression, ensuring that translated content not only maintains accuracy but also adheres to grammatical excellence.

Moreover, the system positions itself as an innovative solution for global communication, fostering connectivity in our interconnected world. By promoting accessibility and understanding across different languages and cultural contexts, the proposed system emerges as a facilitator of meaningful and effective communication.

In summary, the proposed system represents a pioneering approach to language technology, offering a transformative experience by breaking down language barriers, promoting linguistic proficiency, and setting a new standard for

WITH YOU
MENTAL HEALTH TRACKER

PROJECT REPORT

Submitted By

JASNI K R

Reg. No. CCAVSCS027

for the award of the Degree of

Bachelor of Science (B.Sc.)

in Computer Science
(University of Calicut)

under the guidance of

Ms. Rasmi P M

Assistant Professor

BSc. COMPUTER SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE(Autonomous)
IRINJALAKUDA, KERALA
INDIA

March 2024

DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE (AUTONOMOUS)
IRINJALAKUDA

CERTIFICATE

This is to certify that the project report entitled *"With You - Mental Health Tracker"* is a bonfied record of the project work done by **Jasni K R** in partial fulfillment of the requirement for the sixth semester of **Bachelor of Computer Science** in Department of Computer Science of **CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**.

Ms. Rasmi P M
Assistant Professor, CS
Internal Guide

Ms. Sini Thomas
Head of the Department
Computer Science

EXTERNAL EXAMINER

INTERNAL EXAMINER

DECLARATION

I hereby declare that this project work "**WITH YOU - MENTAL HEALTH TRACKER**" submitted to Christ College (Autonomous) Irinjalakuda, affiliated to Calicut University in partial fulfillment of the requirement for the award of the Bachelor of Computer Science, is a record of original work done by us, under the guidance of Ms. RASMI P M, Department of Computer Science.

Place: Irinjalakuda

JASNI K R

ACKNOWLEDGEMENT

First and foremost I like to thank Lord almighty for his providence and for being the guiding light throughout the project. I wish to express my sincere gratitude to my beloved Department head for giving me all the facilities for my project. I take this opportunity to express my gratitude to the class teacher Ms. RASMI P M, our scholar hub guide Ms. PRIYANGA K K and head of the department Ms. SINI THOMAS who has been supported me throughout the course of this project.I am thankful for her aspiring guidance and valuable advice during the project work. I express my sincere thanks to my project guide Ms. RASMI P M for supporting and guiding throughout the project.I would take this opportunity to specially thank all other faculty members for their constant and continuous motivation. Finally I would like to thank my family and friends for giving valuable advice and moral support throughout my project.

ABSTRACT

MENTAL HEALTH TRACKER APP application aims to empower users to monitor their mental health status, track mood fluctuations, identify potential triggers, and access resources for support. Key features include mood tracking, and personalized recommendations based on user input and behavioral patterns. Utilizing data analytics and machine learning algorithms, the application will offer insights into users' mental health trends over time, enabling them to make informed decisions regarding self-care and seek professional help if needed.

Contents

Chapter 1

1 Introduction

Welcome to our project on mental health tracking! In an increasingly digitized world, our focus turns to leveraging technology for mental well-being. Our app aims to provide a holistic approach to mental health monitoring, offering users a user-friendly interface to track their emotional states, access resources, and cultivate healthier habits. Join us on this journey to promote mental wellness through innovation.

1.1 Overview

Our project aims to bridge the gap between technology and mental well-being. At its core, our project revolves around the development of a comprehensive mental health tracker app. This app serves as a multifaceted tool designed to empower users in various aspects of their mental wellness journey. our goal is to harness the power of computer science to create a positive impact on mental health outcomes. By empowering individuals to take proactive steps towards better mental well-being, we strive to contribute to a healthier and more resilient society.

Chapter 2

2   System Analysis

2.1   Purpose

A mental health tracker app developed through a computer science project serves to provide users with tools to monitor and manage their mental well-being. It can include features like mood tracking, journaling, coping strategies, and resources for support. The app aims to promote mental health awareness, offer insights into patterns and triggers, and encourage users to seek professional help when needed.

2.1.1   Existing System

The existing system of a mental health tracker app typically involves features like mood tracking and sometimes reminders for medication or therapy session. Users can log their emotions, and thoughts to gain insights into their mental well-being over time. Some apps also offer resources like coping strategies, relaxation techniques, and mental health assessments. The data collected can be used to identify patterns, triggers, and progress in managing mental health.

2.1.2   Proposed System

The proposed system is an android application that tracks the mental health of a person. This app will help to the patient to improve their mental condition and encourages them to enjoy life and helps them to stay always positive. In this model aims to identify, analyse and characterize the current state of person. The application was created based on interaction between patient and the smart device to connect with psychologist. In this model, mental screening questionnaires includes sentiment analysis which are there for tracking mood and mental condition more precisely. This model helps rationalize negative thoughts.

2.2   Problem definition

In an era where mental health awareness is paramount, there exists a need for accessible, user-friendly, and effective tools to support individuals in monitoring and managing their mental well-being. The problem at hand is to comprehensively investigate and evaluate mental health tracker apps to determine their effectiveness in enhancing users' mental well-being, identify key features and design considerations that contribute to their usability and engagement, and explore their potential role in augmenting traditional mental healthcare delivery models.

2.3 Feasibility study

After the problem is clearly understood and solutions proposed, the next step is to conduct the feasibility study. Feasibility study is defined as evaluation or analysis of the potential impact of the proposed project or program. The objective is to determine whether the proposed system is feasible. There are three aspects of feasibility study to which the proposed system is subjected as discussed below.

2.3.1 Technical Feasibility

Technical feasibility assess whether the current technical resources are sufficient for the new system. We can upgrade the level of technology for supporting our website. We check whether the proposed system can be implemented in the present system without supporting the existing hardware.

2.3.2 Economical Feasibility

Economic feasibility determines whether the time and money are available to develop the system. There is no additional hardware used to develop the site, it is inexpensive to build.

2.3.3 Operational Feasibility

Operational feasibility determines if the human resources are available to operate the system once it has been installed. No extra training is needed to use this system. Anyone who has knowledge in internet in english language can easily use the system. The resources that are required to implement or install are already available with the organization.

Chapter 3

3 Software Requirement Specification

3.1 Purpose

The purpose of this document is to give a detailed description of the Requirements or the MENTAL HEALTH TRACKER APPLICATION . It illustrate the purpose and complete description for the development of the system. It explain system constraints, interface and interactions with other external applications. This document is primarily intended to help users monitor and manage their mental well being.

3.2 Scope

The scope of a Mental Health Tracker app encompasses various features and functionalities aimed at promoting self-awareness, supporting mental health management, and fostering well-being.

3.3 Overall Description

This section give an overview of our application, mental health tracker application. A mental health tracker app is a digital tool designed to help users monitor, manage, and improve their mental well-being. It typically offers a range of features and functionalities to support users in understanding and addressing their mental health concerns.

3.3.1 Product Perspective

A successful Mental Health Tracker app combines user-centric design principles, robust features, data privacy measures, interoperability, continuous improvement, and effective business strategies to deliver value to users and contribute to their mental well-being.

3.3.2 Product Functionality

The functionality of a Mental Health Tracker app is crucial in providing users with tools and features to monitor, manage, and improve their mental well-being.

3.3.3 Users and Characteristics

Mental Health Tracker app users encompass a diverse range of individuals, including those managing diagnosed conditions, seeking self-improvement, supporting others, or prioritizing holistic well-being. Psychological Experts can access the app and diagnose the users who are using the app.

IRON PURITY DETECTION

PROJECT REPORT

Submitted By

MELDEZ THOMAS MATHEW

Reg. No. CCAVSCS028

for the award of the Degree of

Bachelor of Science (B.Sc.)

in Computer Science
(University of Calicut)

under the guidance of

Ms. Viji Vishwanathan

Assistant Professor

BSc. COMPUTER SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE(Autonomous)
IRINJALAKUDA, KERALA
INDIA

July 2021-2024

DEPARTMENT OF COMPUTER SCIENCE

CHRIST COLLEGE (AUTONOMOUS)

IRINJALAKUDA

CERTIFICATE

This is to certify that the project report entitled *"IRON PURITY DE-TECTION"* is a bonafide record of the project work done by **Meldez Thomas Mathew** in partial fulfillment of the requirement for the sixth semester of *Bachelor of Computer Science* in Department of Computer Science of ***CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA***

Ms. Viji vishwanathan
Assistant Professor,CS
Internal Guide

Ms. Sini Thomas
Head of the Department
Computer Science

26/3/2024

EXTERNAL EXAMINER

INTERNAL EXAMINER

DECLARATION

I hereby declare that this project work **"IRON PURITY DETECTION"** submitted to Christ College (Autonomous) Irinjalakuda, affiliated to Calicut University in partial fulfillment of the requirement for the award of the Bachelor of Computer Science, is a record of original work done by us, under the guidance of Ms. VIJI VISWANATHAN, Department of computer Science.

Place: Irinjalakuda

MELDEZ THOMAS MATHEW

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First and foremost i like to thank Lord almighty for his providence and for being the guiding light throughout the project. I wish to express my sincere gratitude to our beloved Department head for giving me all the facilities for our project. I take this opportunity to express my gratitude to the class teacher Ms. RASMI P.M and head of the department Ms. SINI THOMAS who has been supported me throughout the course of this project. I am thankful for her aspiring guidance and valuable advice during the project work. I express my sincere thanks to my project guide Ms. VIJI VISH-WANATHAN for supporting and guiding throughout the project. I would take this opportunity to specially thank all other faculty members for their constant and continuous motivation. Finally I would like to thank my family and friends for giving valuable advice and moral support throughout my project.

ABSTRACT

The project focuses on **IRON PURITY DECTECTION** using machine learning, employing a dataset collected from the site Kaggle. Implemented as a web application, the system utilizes novel detection techniques to classify iron as either pure or impure. This will provide successful application of machine learning for accurate iron purity assessment in an interactive web-based environment.

Contents

Chapter 1

1 Introduction

In industries and manufacturing processes, ensuring the quality and purity of materials is crucial for maintaining product integrity. The "Iron Purity Detection" project addresses the need for a reliable and efficient system to assess the purity of iron samples using advanced regression techniques. This project employs two powerful regression methods: Linear Regression and Stochastic Gradient Descent (SGD) Regression. By leveraging these techniques, we aim to create a robust model capable of predicting the purity of iron samples based on relevant features and attributes.

This dataset is about a flotation plant which is a process used to concentrate the iron ore. This process is very common in a mining plant. The target is to predict the (which is the one hour for the process engineers to have this value. So if it is posible to predict the amount of impurity in the process

Through this project, we not only seek to develop an accurate predictive model but also to contribute to the advancement of quality control processes in industries dealing with iron production. The integration of linear regression and SGD regression offers a comprehensive solution for real-time monitoring and assessment of iron purity, thereby improving overall product quality and reducing operational risks. .

1.1 Overview

The "Iron Purity Detection" project addresses the critical need for accurate and efficient assessment of iron purity in industries involved in iron production, particularly in processes like flotation plants used to concentrate iron ore. The aim is to predict the percentage of silica, an impurity, in the final iron ore concentrate. Given that lab measurements of silica content take considerable time to obtain, the project focuses on developing a predictive model to estimate silica content in real-time during the production process.

To achieve this, the project utilizes advanced regression techniques, specifically Linear Regression and Stochastic Gradient Descent (SGD) Regression. These methods are chosen for their ability to analyze relevant features and attributes of the iron ore samples and make accurate predictions of silica content. By leveraging these techniques, the project aims to create a robust model capable of providing real-time estimates of silica impurity levels, thereby enabling proactive quality control measures in iron production processes.

The integration of Linear Regression and SGD Regression offers a comprehensive solution for monitoring and assessing iron purity, contributing to improved product quality and reduced operational risks in industries dealing with iron production. By providing timely and accurate predictions of silica content, the project not only enhances quality control processes but also drives

efficiency and optimization in iron production operations. Overall, the project's outcomes have the potential to significantly impact the iron production industry by enabling better decision-making and ensuring the integrity of final products.

Chapter 2

2 System Analysis

2.1 Purpose

The purpose of the "Iron Purity Detection" project is to develop a reliable and efficient system for assessing the purity of iron samples in industries involved in iron production. By predicting the percentage of silica, an impurity, in the end product using advanced regression techniques such as Linear Regression and Stochastic Gradient Descent (SGD) Regression, the project aims to provide a tool for real-time monitoring and quality control during the manufacturing process. This contributes to improving product integrity, enhancing quality control processes, and reducing operational risks in industries dealing with iron production.

2.1.1 Existing System

Machine Learning models are created to predict purity of iron. The introductory study includes reviewing the rows, summarizing the columns, basic statistics, data types, and handling missing values. Data preparation and cleaning involve addressing missing values and potential transformations. Exploratory data analysis (EDA) section looks at the independent variables and how it affects the percentage of silica concentrate. Scaling is done using MinMaxScaler and split the data into train and test set using train test split . Model Training:Two regression algorithms are used: Linear Regressor and SGD Regressor algorithms . Trained the model using test data set and predicted the output. Model Evaluation : Calculated the Mean squared error, mean absolute error, and Root mean squared error. Model Prediction : Predicted the percentage of silica by giving new input values. Trained models are saved using pickle..

2.1.2 Proposed System

Iron Purity Detection is done using machine learning algorithms. Here are the key points Data preparation : Data loading and preprocessing using EDA tools like Pandas , Numpy, seaborn, and matplotlib. Algorithms used: 1)Linear Regression : It is a fundamental algorithm in machine learning , commonly usefd for predicting a continuous target variable based on one or more input features. It assumes a linear relationship between the input features and the target variable. The algorithm aims to find the best fit-line that minimizes the difference between the predicted and actual values. The basic steps include defining a linear equation (y = mx + b), determining the coefficients (m and b) through optimization methods like least squares, and using the trained model for predictions. The architecture is straightforward, making it a fundamental tool in regression analysis. 2) SGD Regression : Stochastic Gradient Descent (SGD) Regression is a variant of linear regression that utilizes the stochastic gradient

descent optimization algorithm for training. It updates the model parameters based on a randomly selected subset of the training data (mini-batch) rather than the entire dataset. This stochastic updating helps improve efficiency and scalability. The algorithm seeks to minimize a cost function, often the Mean Squared Error, by iteratively adjusting model coefficients with a learning rate. The stochastic nature of the updates introduces variability, enabling rapid adaptation to changing data patterns. By the careful tuning of hyperparameters, such as learning rate and batch size, is crucial to balance computational efficiency and stable convergence. SGD Regression finds applications in scenarios where processing the entire dataset at once is impractical, making it a valuable tool for large-scale regression problems.

2.2   Problem definition

To know what the problem is and what the needs are before developing it. Here we design a website of Zephyrus for conducting a Techfest in an institution

2.3   FEASIBILITY STUDY

After the problem is clearly understood and solutions proposed, the next step is to conduct the feasibility study. Feasibility study is defined as evaluation or analysis of the potential impact of the proposed project or program. The objective is to determine whether the proposed system is feasible. There are three aspects of feasibility study to which the proposed system is subjected as discussed below.

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STOCK PRICE PREDICITON

PROJECT REPORT

Submitted By

MOHAMED FAIZ

Reg. No. CCAVSCS029

Bachelor of Science (B.Sc.)

in Computer Science

(University of Calicut)

under the guidance of

Ms. Sini Thomas

Head Of the Department

B.Sc. COMPUTER SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
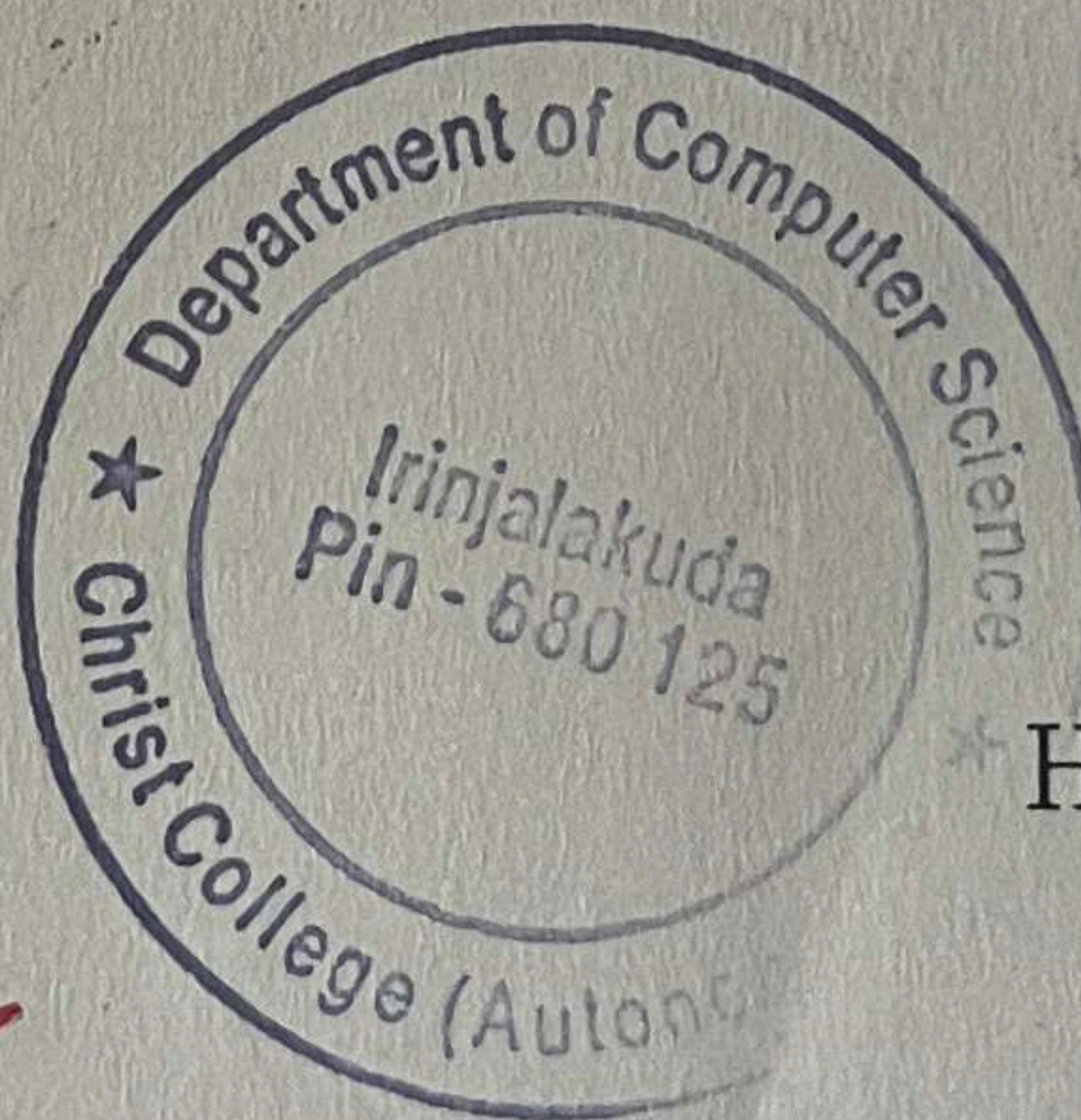**CHRIST COLLEGE**
IRINJALAKUDA, KERALA
March 2024

DEPARTMENT OF COMPUTER SCIENCE

CHRIST COLLEGE (AUTONOMOUS)

IRINJALAKUDA

CERTIFICATE

This is to certify that the project report entitled *"Stock Price Prediction"* is a bonafide record of the project work done by **Mohamed Faiz** in partial fulfillment of the requirement for the sixth semester of **Bachelor of Computer Science** in Department of Computer Science of **CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

Ms. Sini Thomas
Head Of the Department
Internal Guide

26/03/2024

EXTERNAL EXAMINER

Ms. Sini Thomas
Head Of the Department
Computer Science

26/03/24

INTERNAL EXAMINER

DECLARATION

I hereby declare that this project work "**STOCK PRICE PREDIC-TION**" submitted to Christ College (Autonomous) Irinjalakuda, affiliated to Calicut University in partial fulfillment of the requirement for the award of the Bachelor of Computer Science, is a record of original work done by me, under the guidance of Ms. SINI THOMAS, Department of computer Science.

PLACE : IRINJALAKUDA   MOHAMED FAIZ

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First and foremost I would like to thank Lord almighty for his providence and for being the guiding light throughout the project. I wish to express sincere gratitude to my beloved Department head for giving me all the facilities for my project. I take this opportunity to express gratitude to my class teacher Ms. RASMI P.M , my scholar hub guide PRIYANGA K.K and my Head Of the Department Ms. SINI THOMAS who has supported me throughout the course of this project. I am thankful for her aspiring guidance and valuable advice during the project work. I express sincere thanks to my project guide Ms. SINI THOMAS for supporting and guiding throughout the project. I would take this opportunity to specially thank all other faculty members for their constant and continuous motivation. Finally I would like to thank my family and friends for giving valuable advice and moral support throughout my project.

ABSTRACT

STOCK PRICE PREDICITION is a system that aims to predict the future value of the financial stocks of a market. The recent trend in stock market prediction technologies is to use of machine learning which makes predictions based on the values of current stock market indices by training on their previous values. Machine learning itself employs different models to make predictions easier and authentic. This documentation focuses on the use of LSTM- LONG SHORT TERM MEMORY based Machine learning to predict stock values. Factors considered are open,close,low,high,adjacent value and volume.

Contents

Chapter 1

1   INTRODUCTION

The world of finance has long been captivated by the elusive quest for accurate stock prediction. In recent years, advancements in technology and data analytics have revolutionized this pursuit, offering unprecedented opportunities for investors and researchers alike. This project delves into the realm of stock prediction, employing cutting-edge machine learning algorithms and statistical techniques to forecast the future movements of various stocks. By analyzing historical data, market trends, and a plethora of other factors, this report aims to provide a comprehensive overview of the methodologies, challenges, and outcomes associated with stock prediction in today's dynamic financial landscape. Through meticulous analysis and interpretation, this study endeavors to shed light on the complexities of stock markets and offer insights that can inform decision-making processes for investors and financial institutions Accurate prediction of stock prices plays an increasingly prominent role in the stock market where returns and risks fluctuate wildly, and both financial institutions and regulatory authorities have paid sufficient attention to it. As a method of asset allocation, stocks have always been favored by investors because of their high returns. The research on stock price prediction has never stopped. In the early days, many economists tried to predict stock prices. Later, with the in-depth research of mathematical theory and the vigorous development of computer technology, people have found that the establishment of mathematical models can be very good, such as time series model, because its model is relatively simple and the forecasting effect is better. Time series model is applied in a period of time The scope gradually expanded. However, due to the non-linearity of stock data, some machine learning methods, such as support vector machines. Later, with the development of deep learning, some such as RNN, LSTM neural Networks, they can not only process non-linear data, but also retain memory for the sequence and retain useful information, which is positive. It is required for stock data forecasting. This article introduces the theoretical knowledge of time series model and LSTM neural network, and select real stocks in the stock market, perform modeling analysis and predict stock prices, and then use the root mean square error to compare the prediction results of several models. Since the time series model cannot make good use of the non-linear part of the stock data, can't perform long-term memory, and LSTM neural network makes better use of non-linear data and has better use of sequence data. Useful information in the long-term memory, which makes the root mean square error of the prediction result, the LSTM neural network needs smaller than the time series model, indicating that LSTM neural network is a better stock price forecasting method. The time series for stock prices belong to non-stationary and non-linear data, making the prediction of future price trends extremely challenging. In order to learn the long-term dependence of stock prices, deep learning methods such as the LSTM method are used to obtain longer data dependence and overall

change patterns of the stocks.

1.1 Overview

The objective of stock price predictions is to provide investors and traders with insights into potential future movements in stock prices, enabling them to make informed decisions. By analyzing historical data and employing various statistical and machine learning techniques, stock price prediction models aim to forecast the direction and magnitude of price changes over different time horizons. These predictions serve several purposes, including guiding investment decisions, managing risk, optimizing portfolios, and devising trading strategies. Ultimately, the goal is to leverage predictive analytics to enhance financial decision-making and achieve desired investment outcomes in dynamic and uncertain market

1.2 Stock Market

A stock market, equity market or share market is the aggregation of buyers and sellers (a loose network of economic transactions, not a physical facility or discrete entity) of stocks (also called shares), which represent ownership claims on businesses; these may include securities listed on a public stock exchange as well as those only traded privately. Examples of the latter include shares of private companies which are sold to investors through equity crowd funding platforms. Stock exchanges list shares of common equity as well as other security types, e.g. corporate bonds and convertible bonds. Stock price prediction is one of the most widely studied problem, attracting researchers from many fields. The volatile nature of the stock market makes it really difficult to apply simple time-series or regression techniques. Financial institutions and active traders have created various proprietary models to beat the market for themselves or their clients, but rarely did anyone achieve consistently higher than the average returns on investment. The challenge of stock market price forecasting is so appealing because an improvement of just a few points of percentage can increase the profit by millions of dollars. This paper discusses the application of Support Vector Machines and Linear Regression in detail along with the pros and cons of the given methods.

1.3 LSTM - Long Short Term Memory

LSTM networks are an extension of recurrent neural networks (RNNs) mainly introduced to handle situations where RNNs fail.

- It fails to store information for a longer period of time. At times, a reference to certain information stored quite a long time ago is required to predict the current output. But RNNs are absolutely incapable of handling such "long-term dependencies".

- There is no finer control over which part of the context needs to be carried forward and how much of the past needs to be 'forgotten'.

- Other issues with RNNs are exploding and vanishing gradients (explained later) which occur during the training process of a network through back-tracking.

Thus, Long Short-Term Memory (LSTM) was brought into the picture. It has been so designed that the vanishing gradient problem is almost completely removed, while the training model is left unaltered. Long-time lags in certain problems are bridged using LSTMs which also handle noise, distributed representations, and continuous values. With LSTMs, there is no need to keep a finite number of states from beforehand as required in the hidden Markov model (HMM). LSTMs provide us with a large range of parameters such as learning rates, and input and output biases.

1.4 Time Series Model

Stationary time series are divided into strictly stationary time series and wide stationary time series. Below we introduce their definitions. Strictly stationary time series provide important theoretical significance, but it is difficult to obtain the joint distribution of random sequences in the actual research process. Therefore, in order to better use in practical applications, researchers have defined a relatively weak wide stationary time sequence. Researchers choose to use the characteristic statistics of the sequence to define wide stationarity, which can make the constraint conditions a little looser. By ensuring the stationarity of the low-order moments of the sequence to ensure that the sequence can be approximately stationary. Time series analysis also belongs to the field of statistics. It can also analyze the population through samples like statistics. And from the statistical theorems, we can know that the number of random variables is directly proportional to the complexity of the analysis, and the sample size is inversely proportional to the accuracy of obtaining the overall information (obviously the sample information obtained when the population is selected as the sample is Overall information, but such an operation is obviously unrealistic). But time series data has its peculiarities. For a time series $\cdots, X1, X2, \cdots, Xt, \cdots$, its value Xt at any time t is a random variable, and since time is one-way, it cannot be repeated , So we can only get one sample value in this way, which leads to too little sample information for statistical analysis. But if we have the concept of stationarity, this problem will be solved.

Chapter 2

2   SYSTEM ANALYSIS

2.1   Purpose

The main purpose of stock price predictions is to assist investors and traders in making informed decisions about buying, selling, or holding stocks. These predictions aim to provide insights into the potential future movements of stock prices, helping individuals and institutions navigate the complexities of the financial markets and optimize their investment strategies

2.1.1   Existing System

The existing system for stock price prediction typically involves traditional statistical methods, such as moving averages, ARIMA (AutoRegressive Integrated Moving Average), and other time series forecasting techniques. These methods often rely on historical price data and assume certain patterns in the data to make predictions. Limitations of Existing System: The traditional methods may struggle to capture complex patterns and dependencies present in financial time series data.

2.1.2   Proposed System

The proposed system is to use LSTM for prediction. The limitation of the existing system is overcome by LSTM, a type of recurrent neural network (RNN). LSTM is particularly effective for handling long-range dependencies and capturing intricate patterns in sequential data, making it well-suited for stock price prediction. Advantages of Proposed System : LSTM-based models can learn from historical data with memory capabilities, allowing them to adapt to changing market conditions and capture subtle trends that may not be evident with simpler techniques.

2.2   Problem definition

To know what the problem is and what the needs are before developing it. Here we design a model to predict the stock price of a market.

2.3   Feasibility Study

After the problem is clearly understood and solutions proposed, the next step is to conduct the feasibility study. Feasibility study is defined as evaluation or analysis of the potential impact of the proposed project or program. The objective is to determine whether the proposed system is feasible. There are three aspects of feasibility study to which the proposed system is subjected as discussed below.

AI-POWERED VIRTUAL TUTOR

PROJECT REPORT

Submitted By

NAVANEETH KRISHNA V.N

Reg. No. CCAVSCS030

for the award of the Degree of

Bachelor of Science (B.Sc.)

in Computer Science
(University of Calicut)

under the guidance of

Mr.Joju Sebastian

Assistant Professor

BSc. COMPUTER SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE(Autonomous)
IRINJALAKUDA, KERALA
INDIA

March 2024

DEPARTMENT OF COMPUTER SCIENCE

CHRIST COLLEGE (AUTONOMOUS)

IRINJALAKUDA

CERTIFICATE

This is to certify that the project report entitled **"Ai-Powered Virtual Tutor"** is a bonafide record of the project work done by **Navaneeth Krishna.V.N** in partial fulfillment of the requirement for the sixth semester of **Bachelor of Computer Science** in Department of Computer Science of **CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

19/02/2024

Mr.Joju Sebastian
Assistant Professor,CS
Internal Guide

Ms. Sini Thomas
Head of the Department
Computer Science

26/03/24

EXTERNAL EXAMINER

INTERNAL EXAMINER

DECLARATION

I hereby declare that this project work **"AI-POWERED VIRTUAL TUTOR"** submitted to Christ College (Autonomous) Irinjalakuda, affiliated to Calicut University in partial fulfillment of the requirement for the award of the Bachelor of Computer Science, is a record of original work done by me, under the guidance of Mr.JOJU SEBASTIAN, Department of Computer Science.

Place: Irinjalakuda   NAVANEETH KRISHNA V.N

ACKNOWLEDGEMENT

ABSTRACT

AI-Powered Virtual Tutor is an web application designed to revolutionize learning experiences. The application is enriched with two kind of login facilities - admin login, user login. It conducts assessments through seamless integration with various subjects, students can access a comprehensive platform that fosters knowledge acquisition and skill development. The main features are - users can benefit from tailored lessons, real-time feedback and it allows them to track their progress. admin can register users, upload content, update website related activities and so on. All these features make this website more adaptable and user-friendly.

Contents

Chapter 1

1 Introduction

Welcome to our project on AI-powered Virtual Tutor, where learning meets innovation! Experience a transformative approach to education as we analyze your knowledge through interactive tests.In the contemporary realm of education, the integration of artificial intelligence has heralded a paradigm shift in pedagogical approaches, ushering in an era where traditional teaching methods are augmented by the capabilities of cutting-edge technology. A pinnacle manifestation of this transformation is witnessed in the emergence of AI-powered virtual tutors, sophisticated educational tools that go beyond conventional boundaries. This not only assess student's knowledge but also to provide nuanced and tailored guidance. The fundamental premise of these AI-powered virtual tutors revolves around their ability to conduct comprehensive assessments of student's understanding and proficiency across various subjects. By employing intricate algorithms, these digital tutors can analyze vast datasets, discern patterns, and evaluate a student's grasp of diverse concepts. This analytical prowess allows for a nuanced understanding of individual learning trajectories, going beyond standardized assessments to provide a more holistic view of a student's academic strengths and areas that warrant further attention. However, the true innovation lies in the personalized guidance these virtual tutors offer based on the insights gleaned from assessments. Tailored to each student's unique learning profile, these AI-powered mentors can pinpoint specific areas of improvement, recommend targeted resources, and even adapt the learning pace to accommodate individual needs. This level of personalization transcends the limitations of one-size-fits-all approaches, fostering an environment that nurtures each student's intellectual growth. As we delve deeper into the intricate capabilities of AI-powered virtual tutors, it becomes apparent that they serve as more than mere evaluators. They evolve into dynamic guides, steering students through their academic journeys with precision and adaptability. This aims to unravel the layers of this transformative technology, exploring its impact on student assessment and the provision of personalized guidance, ultimately shedding light on the profound implications it holds for the future of education.

1.1 Overview

The main aim of our AI-powered Virtual Tutor project is to revolutionize the education landscape by providing a personalized and adaptive learning experience for students. The cornerstone of our ambitious endeavor lies in the profound transformation of the educational landscape through the deployment of our AI-powered Virtual Tutor. At its core, this visionary project seeks to revolutionize traditional teaching methodologies by providing a learning experience that is not only personalized but also adaptive to the unique needs and learning styles

of individual students. The overarching objective is to propel students towards a deeper understanding and mastery of various subjects, with a specialized emphasis on programming languages like Python, HTML, and PHP. With an unwavering commitment to enhancing educational outcomes, our Virtual Tutor endeavors to usher in a new era where learning is not a one-size-fits-all endeavor but rather a dynamic and tailored experience. The focal point of our efforts is to address the intricacies of programming education, acknowledging that each student possesses distinctive strengths and areas requiring improvement. By tailoring content and guidance to these individual needs, our Virtual Tutor aims to bridge educational gaps and cultivate a holistic understanding of complex subjects. Central to the efficacy of our AI-powered Virtual Tutor is its proficiency in offering personalized guidance and real-time feedback. Gone are the days of passive learning, as our system actively engages with students, adapting its approach based on real-time assessments. This responsiveness ensures that students receive immediate insights into their progress, allowing for a continuous cycle of improvement. Through this interactive feedback loop, the Virtual Tutor becomes not just an instructor but a mentor, guiding students towards programming excellence. Imagine a world where mastering programming languages is not only a pedagogical exercise but an intuitive, engaging journey uniquely tailored to your skills. Our Virtual Tutor provides this transformative experience, transcending the conventional boundaries of education. It invites students to embrace a smarter way of learning, where the intricacies of programming are demystified, and the path to excellence becomes navigable through personalized guidance. In the pages that follow, we will delve into the intricate details of this revolutionary project, exploring how it redefines education and serves as the key to unlocking the door to programming mastery.

Chapter 2

2 System Analysis

2.1 Purpose

The purpose of our AI-powered Virtual Tutor is twofold: to accommodate the
diverse learning speeds of students and to provide comprehensive support for
both fast and slower learners, particularly in the context of programming educa-
tion. This practical application of knowledge encourages a deeper understanding
of programming concepts and enhances real-world problem-solving skills. The
Virtual Tutor adapts to their quick comprehension, preventing boredom or stag-
nation often experienced in traditional, one-size-fits-all learning environments.
The ultimate goal is to empower every student to succeed and thrive in their
programming journey.

2.1.1 Existing System

The existing system of AI-powered systems can analyze a student's strengths
,learning styles and creating tailored learning experiences through conducting
tests. it provides instantaneous feedback to students and guiding them.it adapt
to different learning styles , It also provides chatbot for instant assistance to
students, answer common questions. These tools suggest additional learning
resources, such as videos, or exercises based on a student's progress and interests.

2.1.2 Proposed System

This proposed system aims to create a comprehensive, adaptive, and engag-
ing learning environment for students seeking to master Python, html and php
languages This comprehensive system conducts assessments at three proficiency
levels, offering personalized guidance through videos and notes. When a student
faces difficulty, the system provides instant focus points for improvement, and
individual progress is meticulously tracked. Students can undertake projects
from a curated list, fostering the application of theoretical knowledge in real-
world scenarios. Coding challenges and assessments, tailored to each program-
ming language, deepen the understanding of coding proficiency. The real-time
chat feature connects students with experienced tutors, facilitating on-the-spot
clarification and guidance. A responsive chatbot further assists in addressing
queries and provides real-time problem-solving support, creating a dynamic and
supportive learning environment.The system implements a certification system
and issues progress reports upon course completion, offering tangible recogni-
tion of achievement. Crucially, the system also encourages student feedback
for continuous improvement.To ensure seamless communication, an integrated
feature allows automated report sharing via email to teachers or parents, up-
holding data privacy and security standards.it provides a rich and interactive
learning experience for students.

2.2 Problem definition

To know what the problem is and what the needs are before developing it. current education systems lack personalization, practical application, timely feedback, robust support, effective communication, and struggle to adapt to emerging technologies, posing challenges for an optimal learning experience.

2.3 Feasibility Study

The AI-Powered Virtual Tutor web app serves as an integrated platform for automating the process of knowledge analysis in an educational context. this app allows administrators to seamlessly view and update website related activities and users can login and update their profiles. It acts as a centralized system for efficient management and interaction, emphasizing ease of use and collaborative engagement within the educational environment.

2.3.1 Technical Feasibility

Technical feasibility assess whether the current technical resources are sufficient for the new system. By considering potential upgrades to the technology supporting our website, we aim to determine if the proposed system can seamlessly integrate into the existing infrastructure without necessitating additional hardware support. This assessment includes a careful review of processing power, storage capacity, and compatibility with AI frameworks. The goal is to ensure a smooth implementation that optimizes the current system's capabilities, potentially avoiding the need for significant hardware modifications.

2.3.2 Economical Feasibility

Economic feasibility determines whether the time and money are available to develop the system.it doesn't require additional hardware for development, minimizing upfront costs. The cost-effectiveness is highlighted, making the project financially viable for implementation. This aspect contributes to efficient resource utilization and aligns with economic considerations, ensuring that the development of the virtual tutor is both feasible and economically sustainable.

2.3.3 Operational Feasibility

Operational feasibility for the AI-powered virtual tutor is high, as it requires minimal additional training for users. The system's user-friendly interface ensures accessibility for anyone with internet knowledge and proficiency in English. With existing organizational resources readily available for implementation, the operational aspect is streamlined, facilitating smooth use and maintenance of the virtual tutor. The feasibility assessment suggests that the system is well-aligned with operational capabilities and requires minimal adaptation for successful deployment.

Chapter 3

3 Software Requirement Specification

3.1 Purpose

The purpose of this document is to give a detailed description of the requirements for the web app AI-powered Virtual Tutor. It illustrate the purpose and complete description for the development of the system. It explain system constraints, interface and interactions with other external applications. It primarily intended for students learning programming languages, it offers guidance to learners of varying speeds, accommodating both those who learn slowly and quickly. Notably, this document extends its focus to students unfamiliar with cs subjects, providing an inclusive resource for a diverse range of learners.

3.2 Scope

The scope for our AI-powered virtual tutor involves simplifying and enhancing students learning experiences with systematic tracking of progress through the website. Future expansion includes the potential incorporation of online payment features for added convenience and accessibility. Also the technologies like AR/VR and IoT, catering to diverse learners and fostering collaborative global education.

3.3 Overall Description

This section give an overview of our web app AI-powered virtual tutor.it is tailored for student-centric learning, providing a dynamic platform for assessing and enhancing knowledge. Students can register from anywhere, accessing personalized assessments and visual content. The system allowing students, admins to contribute unique functions. With separate logins, it ensures a participatory and enriched learning experience, focusing on personalized knowledge analysis and skill development.

3.3.1 Product Perspective

The AI-Powered Virtual Tutor web app serves as an integrated platform for automating the process of knowledge analysis in an educational context. this app allows administrators to seamlessly view and update website related activities and users can login and update their profiles. It acts as a centralized system for efficient management and interaction, emphasizing ease of use and collaborative engagement within the educational environment.

3.3.2 Product Functionality

Through this system admin can upload various data including assessments, learning materials, and system updates.students can login and participating in registrations for assessments and projects.

3.3.3 Users and Characteristics

There are two types of users that interact with the site student, admin and teachers. Each of these have different tasks which is performed. Admin can register users, upload content and manage website features. admin has comprehensive control over the system, responsible for administrative tasks. They can access to "Forget Password" for account recover. Teachers can support students by clearing doubts through the web app and engages in direct communication with students, providing guidance and clarification. Students can register, contact teachers for doubt clarification, and provide feedback for app improvement. They can actively participates in the learning process, seeking assistance, and contributing to system enhancement

3.4 Specific Requirements

3.4.1 Hardware Requirements

- System: IBM-Compatible PC

- Processor: Intel Core i3

- Speed: Above 1GHz

- RAM capacity: 4 GB

- Hard Dsk drive: 500 GB

- Keyboard: Standard

- Mouse:Standard

- Monitor:SVGA Color

3.4.2 Software Requirements

- Operating System:Windows or ubuntu

- Language used:Python,Django

- Database : MySql

- Technologies used:HTML,Javascript,CSS,Boot Strap(keros),jquery

3.5 Functional Requirements

It contains three main modules.

- 1.Admin
- 2.Teacher
- 3.User or Student

Admin

An Admin account is used for editing or managing the website dynamically by Admin panel. Admin can register users, upload content and verification of users are done by admin.Admin can update the website related activities.and they have all the logs related to the website.

Teacher

Teachers can support students by clearing doubts through the web app and engages in direct communication with students, providing guidance and clarification.

User or Student

The user or the students can fills a simple registration form in their respective email-id. After registration,users can login to the website. They can update their profiles, and attend accessment to know their knowledge. they can also access chatbot ,contact teachers for doubt clarification, and provide feedback for app improvement.User can download his perfomance certificate.

3.6 Non Functional Requirements

Non-functional requirements define the overall qualities or attributes of the resulting system. Non-functional system place restrictions on the product being developed, the developed process, and specify external constraints that the product must meet. Examples of non-functional requirements include safety, security, usability, reliability and performance requirements. Project management issues (costs, time and schedule) are often considered as non-functional requirements. The principal non - functional constraints which are relevant to critical systems :

- performance
- security
- safety
- usability

Performance

Performance requirements concern the speed of operation of a system. Types of performance requirements :

- Response requirements (how quickly the system reacts to a user input).

- Throughput requirements (how much the system can accomplish within a specified amount of time).

- Availability requirements (is the system available for service when requested by end users). The speed of operation of this system is adequate for the requirements.

Reliability

- Reliability is the ability of a system to perform its required function under stated conditions for a specified period of time.

- constraints on the runtime behavior of the system. This system is reliable because its functionalities can be done on the required conditions.

Safety

Safety requirements are not required which exclude unsafe situation from the possible solution of the system.

Usability

Usability is the ease with which a user can learn to operate, prepare inputs for, and interpret outputs of system or components. Usability requirements include :

- information error messages.

- well-formed user interfaces.

3.7   Interface Requirements

3.7.1   Hardware interfaces

The system must run over the internet, all the hardware shall require to connect internet will be hardware interface for the system. As for example modem,WAN-LAN.For a website hosting an AI-powered virtual tutor, the hardware interfaces primarily relate to the server infrastructure and any additional hardware components required to support the functionality of the website. Server Hardware: The website needs server hardware to host its application and data. Storage Devices: Storage devices are needed to store various data, including user profiles, content, AI models, and session logs. Networking Hardware:Networking hardware facilitates communication between the web server and clients (users' devices) and between different server components.

3.7.2   Software interfaces

For a website hosting an AI-powered virtual tutor, software interfaces are essential components that facilitate communication between different software modules, services, and components.Software interface required for the working of the project is the appropriate operating system. Web Server Interface: The website operates on a web server, such as Apache, Nginx, or Microsoft IIS. The web server handles incoming HTTP requests from clients (users' web browsers) and serves web pages and other resources. Database Interface: The virtual tutor requires a database to store and manage various types of data, including user profiles, learning materials, session logs, and AI model parameters

3.7.3   Communication interfaces

To create a website for an AI-powered virtual tutor, you would typically need several communication interfaces to facilitate interaction between the user and the AI tutor. These interfaces may include:

User Interface (UI): The UI is the visual interface through which users interact with the website. It includes elements such as menus, buttons, forms, and other graphical elements.

Chat Interface: A chat interface allows users to communicate with the AI tutor via text input. Users can ask questions, seek clarification, or engage in conversation with the virtual tutor.

Feedback Interface: An essential aspect of any AI-powered system is the ability to learn and improve over time. A feedback interface allows users to provide feedback on the accuracy and helpfulness of the virtual tutor's responses.

Data Input Interface: Depending on the functionality of the virtual tutor, users may need to input data such as their educational background, learning goals, or preferences.

Notification Interface: Notifications can be used to alert users about important updates, reminders, or new features related to the virtual tutor.

3.8 Security Requirements

- User accesses only their account.

- Validation of input is handled.

- This application containing the computer systems is physically secured against arms or surreptitious entry by intruders.

- Users must be authorized carefully to reduce changes of any such user giving access to an intruder in exchange for a bribe or other favour.

3.9 Platform Used

Windows 10 is a major version of the Microsoft Windows operating system that was released on July 29, 2015.It is built on the Windows NT kernel and follows windows 8.Part of the reason Microsoft decided to name the 2015 release "Windows 10"(and skipped "windows 9")is because the operating system is designed to be a new direction for Microsoft. One of the primary aims of windows 10 is to Unify the windows experience across multiple devices, such desktop computers, tablets, and smartphones. As part of this effort, Microsoft developed Windows10 Mobile alongside Windows 10 to replaces Windows Phone - Microsoft's previous mobile OS. Windows 10 also integrates other Microsoft services, such as Xbox Live and the Cortana voice recognition assistant.

3.10 Technologies Used

Html

HTML is the standard markup language for creating web pages and web applications.HTML is used to structure the content of a web page using a system of elements and tags. These elements represent various types of content such as text, images, links, forms, and multimedia. Each element is enclosed in angle brackets ¡¿ and typically consists of a start tag, content, and an end tag.

Javascript

JavaScript is a high-level programming language commonly used for creating dynamic and interactive websites. It is one of the core technologies of web

development, along with HTML (Hypertext Markup Language) and CSS (Cascading Style Sheets).

CSS

CSS, or Cascading Style Sheets, is a style sheet language used to describe the presentation of a document written in HTML or XML. CSS defines how HTML elements are displayed on screen, in print, or in other media types.

Bootstrap

Bootstrap is a popular front-end framework for building responsive and mobile-first websites. It provides a set of pre-designed HTML, CSS, and JavaScript components and utilities that developers can use to create consistent and visually appealing web interfaces quickly.

What distinguishes PHP from something like client - side Javascript is that the code is executed on the server, generating HTML which is then sent to the client. The client would receive the results of running that script, but would not know what the underlying code was. You can even configure your web server to process all your HTML files with PHP, and then there's really no way that users can tell what you have up your sleeve. The best things in using PHP are that it is extremely simple for a newcomer, but offers many advanced features for a professional programmer.

IRON PURITY DECTECTION

PROJECT REPORT

Submitted By

ALRICH BABU

Reg. No. CCAVSCS001

for the award of the Degree of

Bachelor of Science (B.Sc.)

in Computer Science
(University of Calicut)

under the guidance of

Ms. Viji Vishwanathan

Assistant Professor

BSc. COMPUTER SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE(Autonomous)
IRINJALAKUDA, KERALA
INDIA

July 2021-2024

DEPARTMENT OF COMPUTER SCIENCE

CHRIST COLLEGE (AUTONOMOUS)

IRINJALAKUDA

CERTIFICATE

This is to certify that the project report entitled *"IRON PURITY DE-TECTION"* is a bonafide record of the project work done by **Alrich Babu** in partial fulfillment of the requirement for the sixth semester of **Bachelor of Computer Science** in Department of Computer Science of **CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

Ms. Viji vishwanathan
Assistant Professor,CS
Internal Guide

Ms. Sini Thomas
Head of the Department
Computer Science

26/03/2024

EXTERNAL EXAMINER

26/3/24

INTERNAL EXAMINER

DECLARATION

I hereby declare that this project work **"IRON PURITY DETECTION"** submitted to Christ College (Autonomous) Irinjalakuda, affiliated to Calicut University in partial fulfillment of the requirement for the award of the Bachelor of Computer Science, is a record of original work done by us, under the guidance of Ms. VIJI VISWANATHAN, Department of computer Science.

Place: Irinjalakuda

ALRICH BABU

ACKNOWLEDGEMENT

First and foremost i like to thank Lord almighty for his providence and for being the guiding light throughout the project. I wish to express my sincere gratitude to our beloved Department head for giving me all the facilities for our project. I take this opportunity to express my gratitude to the class teacher Ms. RASMI P.M and head of the department Ms. SINI THOMAS who has been supported me throughout the course of this project. I am thankful for her aspiring guidance and valuable advice during the project work. I express my sincere thanks to my project guide Ms. VIJI VISH-WANATHAN for supporting and guiding throughout the project. I would take this opportunity to specially thank all other faculty members for their constant and continuous motivation. Finally I would like to thank my family and friends for giving valuable advice and moral support throughout my project.

ABSTRACT

The project focuses on **IRON PURITY DECTECTION** using machine learning, employing a dataset collected from the site Kaggle. Implemented as a web application, the system utilizes novel detection techniques to classify iron as either pure or impure. This will provide successful application of machine learning for accurate iron purity assessment in an interactive web-based environment.

Contents

Chapter 1

1 Introduction

In industries and manufacturing processes, ensuring the quality and purity of materials is crucial for maintaining product integrity. The "Iron Purity Detection" project addresses the need for a reliable and efficient system to assess the purity of iron samples using advanced regression techniques. This project employs two powerful regression methods: Linear Regression and Stochastic Gradient Descent (SGD) Regression. By leveraging these techniques, we aim to create a robust model capable of predicting the purity of iron samples based on relevant features and attributes.

This dataset is about a flotation plant which is a process used to concentrate the iron ore. This process is very common in a mining plant. The target is to predict the (which is the one hour for the process engineers to have this value. So if it is posible to predict the amount of impurity in the process

Through this project, we not only seek to develop an accurate predictive model but also to contribute to the advancement of quality control processes in industries dealing with iron production. The integration of linear regression and SGD regression offers a comprehensive solution for real-time monitoring and assessment of iron purity, thereby improving overall product quality and reducing operational risks. .

1.1 Overview

The "Iron Purity Detection" project addresses the critical need for accurate and efficient assessment of iron purity in industries involved in iron production, particularly in processes like flotation plants used to concentrate iron ore. The aim is to predict the percentage of silica, an impurity, in the final iron ore concentrate. Given that lab measurements of silica content take considerable time to obtain, the project focuses on developing a predictive model to estimate silica content in real-time during the production process.

To achieve this, the project utilizes advanced regression techniques, specifically Linear Regression and Stochastic Gradient Descent (SGD) Regression. These methods are chosen for their ability to analyze relevant features and attributes of the iron ore samples and make accurate predictions of silica content. By leveraging these techniques, the project aims to create a robust model capable of providing real-time estimates of silica impurity levels, thereby enabling proactive quality control measures in iron production processes.

The integration of Linear Regression and SGD Regression offers a comprehensive solution for monitoring and assessing iron purity, contributing to improved product quality and reduced operational risks in industries dealing with iron production. By providing timely and accurate predictions of silica content, the project not only enhances quality control processes but also drives

efficiency and optimization in iron production operations. Overall, the project's outcomes have the potential to significantly impact the iron production industry by enabling better decision-making and ensuring the integrity of final products.

Chapter 2

2 System Analysis

2.1 Purpose

The purpose of the "Iron Purity Detection" project is to develop a reliable and efficient system for assessing the purity of iron samples in industries involved in iron production. By predicting the percentage of silica, an impurity, in the end product using advanced regression techniques such as Linear Regression and Stochastic Gradient Descent (SGD) Regression, the project aims to provide a tool for real-time monitoring and quality control during the manufacturing process. This contributes to improving product integrity, enhancing quality control processes, and reducing operational risks in industries dealing with iron production.

2.1.1 Existing System

Machine Learning models are created to predict purity of iron. The introductory study includes reviewing the rows, summarizing the columns, basic statistics, data types, and handling missing values. Data preparation and cleaning involve addressing missing values and potential transformations. Exploratory data analysis (EDA) section looks at the independent variables and how it affects the percentage of silica concentrate. Scaling is done using MinMaxScaler and split the data into train and test set using train test split . Model Training:Two regression algorithms are used: Linear Regressor and SGD Regressor algorithms . Trained the model using test data set and predicted the output. Model Evaluation : Calculated the Mean squared error, mean absolute error, and Root mean squared error. Model Prediction : Predicted the percentage of silica by giving new input values. Trained models are saved using pickle..

2.1.2 Proposed System

Iron Purity Detection is done using machine learning algorithms. Here are the key points Data preparation : Data loading and preprocessing using EDA tools like Pandas , Numpy, seaborn, and matplotlib. Algorithms used: 1)Linear Regression : It is a fundamental algorithm in machine learning , commonly usefd for predicting a continuous target variable based on one or more input features. It assumes a linear relationship between the input features and the target variable. The algorithm aims to find the best fit-line that minimizes the difference between the predicted and actual values. The basic steps include defining a linear equation ($y = mx + b$), determining the coefficients (m and b) through optimization methods like least squares, and using the trained model for predictions. The architecture is straightforward, making it a fundamental tool in regression analysis. 2) SGD Regression : Stochastic Gradient Descent (SGD) Regression is a variant of linear regression that utilizes the stochastic gradient

descent optimization algorithm for training. It updates the model parameters based on a randomly selected subset of the training data (mini-batch) rather than the entire dataset. This stochastic updating helps improve efficiency and scalability. The algorithm seeks to minimize a cost function, often the Mean Squared Error, by iteratively adjusting model coefficients with a learning rate. The stochastic nature of the updates introduces variability, enabling rapid adaptation to changing data patterns. By the careful tuning of hyperparameters, such as learning rate and batch size, is crucial to balance computational efficiency and stable convergence. SGD Regression finds applications in scenarios where processing the entire dataset at once is impractical, making it a valuable tool for large-scale regression problems.

2.2   Problem definition

To know what the problem is and what the needs are before developing it. Here we design a website of Zephyrus for conducting a Techfest in an institution

2.3   FEASIBILITY STUDY

After the problem is clearly understood and solutions proposed, the next step is to conduct the feasibility study. Feasibility study is defined as evaluation or analysis of the potential impact of the proposed project or program. The objective is to determine whether the proposed system is feasible. There are three aspects of feasibility study to which the proposed system is subjected as discussed below.

2.3.1   Technical Feasibility

Technical feasibility assess whether the current technical resources are sufficient for the new system. We can upgrade the level of technology for supporting our website. We check whether the proposed system can be implemented in the present system without supporting the existing hardware.

2.3.2   Economical Feasibility

Economic feasibility determines whether the time and money are available to develop the system. There is no additional hardware used to develop the site, it is inexpensive to build.

2.3.3   Operational Feasibility

Operational feasibility determines if the human resources are available to operate the system once it has been installed. No extra training is needed to use this system. Anyone who has knowledge in internet in english language can easily use the system. The resources that are required to implement or install are already available with the organization.

STUDENT RESULT ANALYSIS SYSTEM

PROJECT REPORT

Submitted By

ANANNYA N V

Reg. No. CCAVSCS002
for the award of the Degree of

Bachelor of Science (B.Sc.)

in Computer Science
(University of Calicut)

under the guidance of

Mr.Thoufeeq Ansari

Assistant Professor

BSc. COMPUTER SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE(Autonomous)
IRINJALAKUDA, KERALA
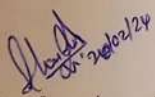**INDIA**

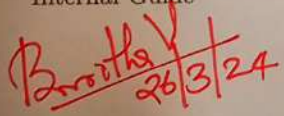**March 2024**

DEPARTMENT OF COMPUTER SCIENCE

CHRIST COLLEGE (AUTONOMOUS)

IRINJALAKUDA

CERTIFICATE

This is to certify that the project report entitled *"STUDENT RESULT ANALYSIS SYSTEM"* is a bonfied record of the project work done by *ANANNYA NV* in partial fulfillment of the requirement for the sixth semester of *Bachelor of Computer Science* in Department of Computer Science of **CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

Mr. Thoufeeq Ansari
Assistant Professor,CS
Internal Guide

Ms. Sini Thomas
Head of the Department
Computer Science

EXTERNAL EXAMINER

INTERNAL EXAMINER

DECLARATION

I hereby declare that this project work **"STUDENT RESULT ANAL-YSIS SYSTEM"** submitted to Christ College (Autonomous) Irinjalakuda, affiliated to Calicut University in partial fulfillment of the requirement for the award of the Bachelor of Computer Science, is a record of original work done by me, under the guidance of Mr. Thoufeeq Ansari, Department of computer Science.

Place: Irinjalakuda   ANANNYA N V

ACKNOWLEDGEMENT

ABSTRACT

STUDENT RESULT ANALYSIS SYSTEM is a web site design. This application used for the analyzing the student results according to the user requirements and generate the performance report of student, subject or branch. It also allows the student to see their individual performance in semester. this will help the college management to take the appropriate actions to improve the quality of education and helps in improving the performance of students. Resource-related results analysis is one variation of results analysis

Contents

Chapter 1

1 Introduction

Student Result Analysis System is a web site design. This website used for the analysing the students results according to the user requirements. It also allows the student to see their individual performance in semester. this will help the college management to take the appropriate actions to improve the quality of education and helps in improving the performance of students. In this Result Analysis System there are four login. Admin login ,Staff login, HOD login and Student login. Admin login can add HOD, Staff, Student, Course, Subject, Session and also manage them all. Staff login can add result, edit result, view result and compare the results. HOD login can compare results between classes. Student login can view result and compare results. This system has been designed to carry out the mark analysis process in an educational institution. Now a day result analysis and comparison is done manually by taking lots of effort and time. This system is a solution for such problems.

1.1 Overview

Student Result Analysis System is a web site which designed by using python and django. This website used for the analysing the student results according to the user requirements and generate the statistical graph.

Chapter 2

2   System Analysis

2.1   Purpose

The student results analysis system project aims to create a user-friendly system for educational institutions to manage and analyse student performance. In this Result Analysis System there are four login. Admin login ,Staff login, HOD login and Student login. Admin login can add HOD, Staff, Student, Course, Subject, Session and also manage them all. Staff login can add result, edit result, view result and compare the results. HOD login can compare results between classes. Student login can view result and compare results. It store and manage students information, including personal details and academic records. Analysing student performance across various subjects, semesters, or academic periods. Allowing students, teachers, and administrators to track students and batch progress over time. Generating statistical reports and charts to visualize trends and patterns in student performance. Presenting data in a visually appealing and easy-to-understand format, such as graphs, charts, and tables.

2.1.1   Existing System

An existing system for student result analysis typically involves software or a platform designed to efficiently manage and analyze students academic performance.

2.1.2   Proposed System

Student Result Analysis System is an student driven system that is designed in order to keep record of student data by use of technology. Now-a-day result analysis is done manually taking lots of effort and time then too desired accuracy is not achieved. Also updation of data is very difficult as all data needs to revised again. In addition more paperwork and documentation is required.

2.2   Problem definition

Inefficiency in Result Management: Manual processes for entering and managing student results lead to inefficiencies, errors, and delays in updating academic records.

Limited Data Analysis Capabilities: Existing systems may lack robust tools for analyzing student performance data, hindering educators' ability to identify trends, patterns, and areas for improvement.

Lack of Insightful Reporting: Current reporting mechanisms may provide basic information but fail to deliver actionable insights that can guide decision-making and instructional planning.

Communication Gaps: Inadequate communication channels between teachers, students, and parents/guardians may hinder timely feedback on academic progress and performance.

Data Security and Privacy Concerns: With increasing reliance on digital platforms, ensuring the security and privacy of student data becomes paramount to comply with regulations and safeguard sensitive information.

Scalability Issues: Existing systems may struggle to scale effectively to accommodate growing student populations or evolving educational requirements.

2.3 Feasibility study

After the problem is clearly understood and solutions proposed, the next step is to conduct the feasibility study. Feasibility study is defined as evaluation or analysis of the potential impact of the proposed project or program. The objective is to determine whether the proposed system is feasible. There are three aspects of feasibility study to which the proposed system is subjected as discussed below.

2.3.1 Technical Feasibility

Technical feasibility assess whether the current technical resources are sufficient for the new system. We can upgrade the level of technology for supporting our website. We check whether the proposed system can be implemented in the present system without supporting the existing hardware.

2.3.2 Economical Feasibility

Economic feasibility determines whether the time and money are available to develop the system. There is no additional hardware used to develop the site, it is inexpensive to build.

2.3.3 Operational Feasibility

Operational feasibility determines if the human resources are available to operate the system once it has been installed. No extra training is needed to use this system. Anyone who has knowledge in internet in english language can easily use the system. The resources that are required to implement or install are already available with the organization.

Chapter 3

3 Software Requirement Specification

3.1 Purpose

The main purpose of the project is to streamline the process of gathering, organizing, and presenting student academic data. It aims to offer insights into individual and group performance, identify areas of improvement, and enable effective academic planning.

3.2 Scope

User authentication: Secure login and access control for administrators, teachers, and students. Result management: Uploading, storing, and organizing student results in a database. Dashboard: Displaying visualizations and summaries of student performance and class-wise statistics. Individual student analysis: Providing detailed performance reports for each student Class analysis: Comparative analysis of class-wise performance and subject-wise trends.

3.3 Overall Description

Student result analysis is a web site developed for colleges to analyze the results of student. For students it is easy to check the result, it will simply enter their email id and password. It store and manage students information, including personal details and academic records. Analysing student performance across various semesters, or academic periods. Allowing students, teachers, and administrators to track students and batch progress over time.

3.3.1 Product Perspective

The product perspective of a student result analyzer project involves considering its functionality, usability, and integration with existing systems.

3.3.2 Product Functionality

The student result analyzer should be able to efficiently process and analyze student results from various subjects and semesters. It should calculate marks and display statistic graphs.

3.3.3 Users and Characteristics

There are four types of users that interact with the site admin, Staffs,HOD and Students. Each of these have different tasks which is performed. Admin login can add HOD, Staff, Student, Course, Subject, Session and also manage them all. Staff login can add result, edit result, view result and compare the results.

WriteWell

PROJECT REPORT

Submitted By

ANIRUDH PRADEEP

Reg. No. CCAVSCS003

for the award of the Degree of

Bachelor of Science (B.Sc.)

in Computer Science
(University of Calicut)

under the guidance of

Ms. Vandana T V

Assistant Professor

BSc. COMPUTER SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE(Autonomous)
IRINJALAKUDA, KERALA
INDIA

July 2021-2024

DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE (AUTONOMOUS)
IRINJALAKUDA

CERTIFICATE

This is to certify that the project report entitled *"Write Well"* is a bonafide record of the project work done by **Anirudh Pradheep** in partial fulfillment of the requirement for the sixth semester of **Bachelor of Computer Science** in Department of Computer Science of **CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

Ms. Vandana T V
Assistant Professor,CS
Internal Guide

Ms. Sini Thomas
Head of the Department
Computer Science

EXTERNAL EXAMINER

INTERNAL EXAMINER

DECLARATION

I hereby declare that this project work **"WriteWell"** submitted to Christ College (Autonomous) Irinjalakuda, affiliated to Calicut University in partial fulfillment of the requirement for the award of the Bachelor of Computer Science, is a record of original work done by us, under the guidance of Ms. VANDANA T V, Department of computer Science.

ANIRUDH PRADHEEP

Place: Irinjalakuda

ACKNOWLEDGEMENT

First and foremost I like to thank Lord almighty for his providence and for being the guiding light throughout the project. I wish to express my sincere gratitude to our beloved Department head for giving me all the facilities for our project. I take this opportunity to express my gratitude to the class teacher Ms. RASMI P M and head of the department Ms. SINI THOMAS who has been supported us throughout the course of this project. I are thankful for her aspiring guidance and valuable advice during the project work. I express my sincere thanks to my project guide Ms. VANADANA T V for supporting and guiding throughout the project.I would take this opportunity to specially thank all other faculty members for their constant and continuous motivation. Finally I would like to thank my family and friends for giving valuable advice and moral support throughout our project.

ABSTRACT

WriteWell aims to provide users with a versatile linguistic toolset, offering the ability to translate text, PDF documents, audio files, and images. The platform incorporates multiple functionalities, including translation services powered by APIs such as Google Cloud Translation or Microsoft Translator. Users can seamlessly input text, upload PDFs, audio files, or images, receiving accurate translations in return.Furthermore, the web app incorporates a grammar checker to enhance the quality of written content. The grammar checker feature helps users refine their text by identifying and suggesting corrections for grammatical errors. This ensures that the translated content maintains a high standard of language accuracy.

In addition to translation and grammar checking, the web app includes an English grammar quiz chatbot. This interactive feature engages users in a quiz format, assessing their understanding of English grammar rules. The chatbot provides instant feedback and explanations, contributing to a dynamic and educational user experience.

Overall, this web application serves as a comprehensive linguistic tool, combining translation capabilities, grammar checking features, and an interactive grammar quiz chatbot to cater to diverse language-related needs.

Contents

Chapter 1

1 Introduction

Embark on a linguistic odyssey with our state-of-the-art web application, a versatile and all-encompassing tool that redefines the way we communicate. Offering a suite of features that spans text, audio, image, and PDF translation, our platform goes above and beyond by incorporating a sophisticated grammar checker. More than a mere translation aid, this web application becomes your linguistic companion, facilitating a nuanced and polished communication experience across various mediums.Amidst the myriad of language-related challenges, our grammar checker emerges as a beacon of precision. It meticulously analyzes your written content, ensuring grammatical excellence and elevating the quality of your expression. This innovative feature goes beyond traditional language tools, providing users with a holistic solution for enhancing both translation accuracy and grammatical finesse.Providing a q/a chatbot about english garmmar which helps the user to improve their english language skill .In a world where effective communication is paramount, our web application stands as a testament to technological innovation. Join us in exploring the seamless integration of translation and grammar checking, creating a unique synergy that sets this platform apart. Elevate your communication game and unlock a new realm of linguistic prowess with our web application—an embodiment of precision, clarity, and excellence in the art of expression.

1.1 Overview

The objective of the Writewell is to Develop a system which able to do conversation between the languages . It will provide fast and accurate feedback on the quality of the user's writing . And also to support multiple languages , and adapt to the user's preferences and needs.It is used for solving every queries to user about the grammar of the language. It will help the user to learn different language . a linguistic marvel designed to reshape how we interact with language. Boasting an array of features that span text, audio, image, and PDF translation, our platform takes communication to the next level by incorporating an advanced grammar checker. This tool, far more than a translation companion, becomes your guide to refined expression, ensuring not only accurate translation but also grammatical excellence. The grammar checker, a standout feature, meticulously refines your written content, elevating it to a new standard of clarity. Finally a chatbot that helps your english skill by providing grammar quiz.This integration of translation and grammar checking offers users a comprehensive solution, addressing the diverse linguistic challenges faced in our interconnected global landscape.it involves perfecting the nuances of expression. With our web application, witness the seamless synergy of translation and

grammar enhancement, unlocking a realm of precision, clarity, and excellence in communication.

Chapter 2

2 System Analysis

2.1 Purpose

The web application has been meticulously crafted with a multifaceted purpose, aspiring to redefine and elevate the user experience in effective communication across a spectrum of mediums. Its expansive repertoire of features encompasses not only text, audio, image, and PDF translation but also introduces an advanced grammar checker and a quiz chatbot, distinguishing it as a comprehensive language tool. Beyond the conventional boundaries of translation, this integrated grammar checker is designed to ensure not just linguistic accuracy but also grammatical excellence,the chatbot helps the individual to improve their english grammar, reflecting the platform's commitment to refining written expression.

In addressing the diverse needs of users, the web application emerges as a holistic language solution, seamlessly navigating personal, academic, and professional spheres. The versatility embedded in its design enables users to adapt the application to various linguistic challenges, positioning it as an adaptive and indispensable tool. This innovative approach to communication technology sets the platform apart, ushering in a new era where precision, clarity, and linguistic proficiency converge.

Furthermore, the web application serves as a catalyst for global connectivity, facilitating effective communication in our interconnected world. By prioritizing accessibility and understanding across different languages and cultural contexts, the platform becomes a bridge for fostering meaningful connections. In summary, the web application transcends conventional boundaries, presenting itself as a transformative language companion that not only breaks down language barriers but also enriches the quality of expression in our dynamic and interconnected global landscape.

2.1.1 Existing System

Presently there are lot of grammer checker applications and translation applications .In all of those systems it takes the text input given by the user and clear all the grammar mistake that are present in the sentence/paragraph and paraphrase . The whole sentence/paragraph is converted into different form that is perfect to use in an official content . Even though they are using many machine learning algorithms , Optical character recognition , N-Gram and sequence to sequence are the main algorithm that are used in these . The existing system likely includes basic language translation features for text and, possibly, audio. It might lack the integration of advanced grammar checking capabilities, focusing primarily on straightforward translation services. The range of supported

mediums such as images and PDFs might be limited compared to the proposed system.

Furthermore, the user interface and overall user experience in the existing system might not be as streamlined and versatile. It might lack certain functionalities that enhance user convenience and adaptability across different linguistic scenarios.

In terms of global connectivity, the existing system may not prioritize cultural nuances and diverse language contexts as comprehensively as the proposed system. It might lack features that address the specific challenges associated with refined communication in an interconnected world.

In essence, the existing system, which may have served adequately in its time, is likely to lack some of the innovative features and capabilities introduced by the proposed system. The proposed system aims to overcome these limitations by offering a more comprehensive, versatile, and refined language solution for users.

2.1.2 Proposed System

Compared to existing system we are also using the same machine learning algorithms for our system . We are trying to combine all the functions provided by the grammar checking web apps and translation apps into a single window that makes our system user-friendly .We can use it as a language guide for travelers ,students ,employees etc .The proposed system is a comprehensive and innovative web application designed to redefine language interaction and communication. This dynamic platform encompasses a range of features, including text, audio, image, and PDF translation, aiming to facilitate seamless understanding across diverse mediums. Notably, the system distinguishes itself by incorporating an advanced grammar checker.There is a chatbot which helps to improve our english language to which elevating it beyond traditional translation tools and emphasizing the importance of grammatical precision in communication.

At its core, the proposed system seeks to address the evolving needs of users in personal, academic, and professional spheres. The versatility embedded in its design allows users to navigate various linguistic challenges, providing a holistic language solution. The integration of a grammar checker stands as a testament to the system's commitment to refining written expression, ensuring that translated content not only maintains accuracy but also adheres to grammatical excellence.

Moreover, the system positions itself as an innovative solution for global communication, fostering connectivity in our interconnected world. By promoting accessibility and understanding across different languages and cultural contexts, the proposed system emerges as a facilitator of meaningful and effective communication.

In summary, the proposed system represents a pioneering approach to language technology, offering a transformative experience by breaking down language barriers, promoting linguistic proficiency, and setting a new standard for

AUDIO TO SIGN LANGUAGE TOOL

PROJECT REPORT

Submitted By

CHRIS BENNY KUNIYANTHODATH

Reg. No. CCAVSCS004

for the award of the Degree of

Bachelor of Science (B.Sc.)

in Computer Science
(University of Calicut)

under the guidance of

Ms. Varsha Ganesh

Assistant Professor

BSc. COMPUTER SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE (AUTONOMOUS)
IRINJALAKUDA, KERALA
March 2024

DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE (AUTONOMOUS)
IRINJALAKUDA

CERTIFICATE

This is to certify that the project report entitled **"AUDIO TO SIGN LANGUAGE TOOL"** is a bonfied record of the project work done by **Chris Benny Kuniyanthodath** in partial fulfillment of the requirement for the sixth semester of **Bachelor of Computer Science** in Department of Computer Science of **CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

Ms. Varsha Ganesh
Assistant Professor
Internal Guide

Ms. Sini Thomas
Head of Department
Computer Science

26/03/24

EXTERNAL EXAMINER

26/03/24

INTERNAL EXAMINER

DECLARATION

I hereby declare that this project work **"AUDIO TO SIGN LAN-GUAGE TOOL"** submitted to Christ College (Autonomous) Irinjalakuda, affiliated to Calicut University in partial fulfillment of the requirement for the award of the Bachelor of Computer Science, is a record of original work done by me, under the guidance of Ms. VARSHA GANESH, Department of computer Science.

Place: Irinjalakuda   CHRIS BENNY KUNIYANTHODATH

ACKNOWLEDGEMENT

First and foremost I like to thank Lord almighty for his providence and for being the guiding light throughout the project. I wish to express my sincere gratitude to our beloved Department head for giving me all the facilities for our project. I take this opportunity to express my gratitude to the class teacher Ms RASMI PM and head of the department Ms SINI THOMAS who has been supported us throughout the course of this project. I'm thankful for her aspiring guidance and valuable advice during the project work. I express my sincere thanks to my project guide Ms VARSHA GANESH for supporting and guiding throughout the project. I would take this opportunity to specially thank all other faculty members for their constant and continuous motivation. Finally, I would like to thank my family and friends for giving valuable advice and moral support throughout our project.

ABSTRACT

Audio to Sign Language Tool is introduced to address communication barriers faced by individuals who are deaf or hard of hearing by providing a web-based platform that converts spoken language into sign language animations. Leveraging technologies such as natural language processing (NLP), speech recognition, and 3D animation tools like Blender, the project facilitates communication accessibility and inclusivity for users with diverse communication needs. Through an intuitive user interface, users can input audio, view corresponding sign language animations, and provide feedback, fostering greater understanding and engagement. The project represents an innovative and impactful initiative in leveraging technology to promote communication accessibility and inclusivity for individuals with hearing impairments.

Contents

Chapter 1

1 Introduction

In recent years, there has been a growing interest in developing technologies that bridge the communication gap between individuals who are deaf or hard on hearing and those who can hear. One such technology is the Audio to Sign Language Tool, which aims to translate spoken language into sign language gestures in real-time. This innovative solution can enhance communication and facilitate effective interaction between hearing and deaf individuals. The Audio to Sign Language Tool leverages the power of machine learning and computer vision techniques to analyse spoken language and generate corresponding sign language gestures. Python, a popular programming language, provides a flexible and efficient platform for implementing this converter. By utilizing Python libraries and frameworks, we can create a robust and accurate system that can recognize and interpret spoken language and generate the appropriate sign language output. The key components of the Audio to Sign Language Converter system include: Speech Recognition, Natural Language Processing (NLP), User Interface, Lemmatization, Stop words, Tokenization, Characterization, Speech API, NLP toolkit, localhost, Hand Gestures, Sign Language

1.1 Overview

Our objective is to help people suffering from the problem of hearing. The Audio to Sign Language Tool holds great potential to improve communication accessibility for individuals with hearing impairments. By utilizing Python and its rich ecosystem of libraries and frameworks, we can develop a sophisticated and effective system that converts spoken language into sign language gestures in real-time. This technology has the potential to bridge the communication gap and enhance inclusivity for individuals who are deaf or hard of hearing in various domains, including education, healthcare, and everyday social interactions.

Chapter 2

2 System Analysis

2.1 Purpose

The main purpose of the "Audio to Sign Language Tool" website is to facilitate communication between individuals who are deaf or hard of hearing and those who can communicate verbally. The website serves as a platform where users can input audio messages, which are then converted into sign language animations. This conversion allows individuals who use sign language to understand and respond to the spoken messages effectively.

2.1.1 Existing System

Existing models for audio and text-to-sign language translation offer valuable insights into this field, although they predominantly concentrate on American Sign Language (ASL), leaving a notable gap for Indian Sign Language (ISL) solutions. These models, such as Ankita Harkude and her team's audio-to-ISL converter and Oi Mean Fang's speech-to-sign language system for Malaysians, showcase various approaches but often face limitations, including complexity and reduced accuracy. Khalid Khalil's ASL interpreter system using Sphinx 3.5 Speech Recognition and Ezhumalai P's text-to-ASL translator reveal further diversity in methodologies. Limitations of existing system: Existing sign language conversion models primarily focus on American Sign Language (ASL), which doesn't cater to the unique needs of Indian Sign Language (ISL) users.

2.1.2 Proposed System

To enhance the accessibility and understanding of deaf and hearing-impaired individuals, we plan to use animations, making the output visually appealing and interactive. This system will bridge the communication gap by providing ISL representations, addressing the specific needs of the Indian community. The workflow involves capturing audio input, converting it to text, processing it using Natural Language Processing (NLP) techniques, and generating ISL animations using Blender 3D animation tools. This approach not only offers a novel solution but also focuses on enhancing the quality of communication for the hearing-impaired. Advantages of proposed system Improved Educational Opportunities, Employment Inclusivity, Wider Information Access, Independence and Autonomy, Local Indian languanges also can be coverted. Audio file which is uploaded by the user can be also convert to ISL.

2.2 Problem definition

To know what the problem is and what the needs are before developing it. Here we design a website of Audio to sign language converter for deaf people.

2.3 Feasibility Study

After the problem is clearly understood and solutions proposed, the next step is to conduct the feasibility study. Feasibility study is defined as evaluation or analysis of the potential impact of the proposed project or program. The objective is to determine whether the proposed system is feasible. There are three aspects of feasibility study to which the proposed system is subjected as discussed below.

2.3.1 Technical Feasibility

Technical feasibility assess whether the current technical resources are sufficient for the new system. We can upgrade the level of technology for supporting our website. We check whether the proposed system can be implemented in the present system without supporting the existing hardware.

2.3.2 Economical Feasibility

Economic feasibility determines whether the time and money are available to develop the system. There is no additional hardware used to develop the site, it is inexpensive to build.

2.3.3 Operational Feasibility

Operational feasibility determines if the human resources are available to operate the system once it has been installed. No extra training is needed to use this system. Anyone who has knowledge in internet in english language can easily use the system. The resources that are required to implement or install are already available with the organization.

Chapter 3

3 Software Requirement Specification

3.1 Purpose

The purpose of this document is to give a detailed description of the requirements for the AUDIO TO SIGNLANGUAGE TOOL. It illustrate the purpose and complete description for the development of the system. It explain system constraints, interface and interactions with other external applications. This document is primarily intended to be proposed for normal people to bridge the communication gap between the deaf people.

3.2 Scope

Our project has made it easier for normal people to communicate with deaf people easily and systematically. This encompasses the development of a versatile language conversion system that supports English, Malayalam, and Hindi languages initially, with provisions for future expansion to include more languages. Future directions may include expanding language support, enhancing user customization options, and integrating feedback mechanisms for continuous improvement. Sign language translator can be used in schools, colleges, hospitals, universities, airports, courts. Anywhere anyone can use this system for understanding the sign language to communicate. The future work is to develop an application where in the news channels can use it while giving news, in one corner of the screen it will be displayed in sign language for deaf people.

3.3 Overall Description

This section give an overview of our website, AUDIO TO SIGNLANGUAGE TOOL. This project is designed for deaf people. This system enables users to register and login to the system. It also enables the users to speech and view the corresponding Sign Language generation. The user can speech through either Hindi, English or Malayalam.

3.3.1 Product Perspective

AUDIO TO SIGNLANGUAGE TOOL is mainly used for effective communication between normal people and deaf people. The users can speech or text and corresponding SignLanguage will be generated by animation. The users can also upload the audio files which can also be converted.

3.3.2 Product Functionality

Through this system users can register and login to the system. Users can speech, text or upload the audio files which are needed to be converted. Users are

AUDIO TO SIGN LANGUAGE TOOL

PROJECT REPORT

Submitted By

CLINET ROVEA ROSS

Reg. No. CCAVSCS005

for the award of the Degree of

Bachelor of Science (B.Sc.)

in Computer Science
(University of Calicut)

under the guidance of

Ms. Varsha Ganesh

Assistant Professor

**BSc. COMPUTER SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE (AUTONOMOUS)
IRINJALAKUDA, KERALA
March 2024**

DEPARTMENT OF COMPUTER SCIENCE

CHRIST COLLEGE (AUTONOMOUS)

IRINJALAKUDA

CERTIFICATE

This is to certify that the project report entitled **"AUDIO TO SIGN LANGUAGE TOOL"** *is a bonfied record of the project work done by* **Clinet Rovea Ross** *in partial fulfillment of the requirement for the sixth semester of* **Bachelor of Computer Science** *in Department of Computer Science of* **CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

Ms. Varsha Ganesh
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Ms. Sini Thomas
Head of Department
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EXTERNAL EXAMINER

INTERNAL EXAMINER

DECLARATION

I hereby declare that this project work **"AUDIO TO SIGN LAN-GUAGE TOOL"** submitted to Christ College (Autonomous) Irinjalakuda, affiliated to Calicut University in partial fulfillment of the requirement for the award of the Bachelor of Computer Science, is a record of original work done by me, under the guidance of Ms. VARSHA GANESH, Department of computer Science.

Place: Irinjalakuda

CLINET ROVEA ROSS

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3 Software Requirement Specification

3.1 Purpose

The purpose of this document is to give a detailed description of the requirements for the AUDIO TO SIGNLANGUAGE TOOL. It illustrate the purpose and complete description for the development of the system. It explain system constraints, interface and interactions with other external applications. This document is primarily intended to be proposed for normal people to bridge the communication gap between the deaf people.

3.2 Scope

Our project has made it easier for normal people to communicate with deaf people easily and systematically. This encompasses the development of a versatile language conversion system that supports English, Malayalam, and Hindi languages initially, with provisions for future expansion to include more languages. Future directions may include expanding language support, enhancing user customization options, and integrating feedback mechanisms for continuous improvement. Sign language translator can be used in schools, colleges, hospitals, universities, airports, courts. Anywhere anyone can use this system for understanding the sign language to communicate. The future work is to develop an application where in the news channels can use it while giving news, in one corner of the screen it will be displayed in sign language for deaf people.

3.3 Overall Description

This section give an overview of our website, AUDIO TO SIGNLANGUAGE TOOL. This project is designed for deaf people. This system enables users to register and login to the system. It also enables the users to speech and view the corresponding Sign Language generation. The user can speech through either Hindi, English or Malayalam.

3.3.1 Product Perspective

AUDIO TO SIGNLANGUAGE TOOL is mainly used for effective communication between normal people and deaf people. The users can speech or text and corresponding SignLanguage will be generated by animation. The users can also upload the audio files which can also be converted.

3.3.2 Product Functionality

Through this system users can register and login to the system. Users can speech, text or upload the audio files which are needed to be converted. Users are

INTERVIEW CONFIDENCE LEVEL ANALYZER

PROJECT REPORT

Submitted By

DARINE JACOB

Reg. No. CCAVSCS006

for the award of the Degree of

Bachelor of Science (B.Sc.)

in Computer Science
(University of Calicut)

under the guidance of

Ms. Soumya P S

Assistant Professor

BSc. COMPUTER SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
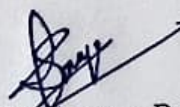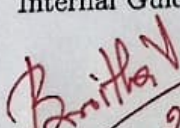**CHRIST COLLEGE(Autonomous)**
IRINJALAKUDA, KERALA
INDIA

March 2024

DEPARTMENT OF COMPUTER SCIENCE

CHRIST COLLEGE (AUTONOMOUS)

IRINJALAKUDA
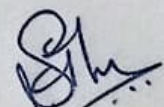
CERTIFICATE

This is to certify that the project report entitled "**Interview confidence level analyser**" is a bonafide record of the project work done by **Darine Jacob** in partial fulfillment of the requirement for the sixth semester of Bachelor of Computer Science in Department of Computer Science of **CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

Ms. Soumya P S
Assistant Professor,CS
Internal Guide

Ms. Sini Thomas
Head of the Department
Computer Science

EXTERNAL EXAMINER

INTERNAL EXAMINER

DECLARATION

I hereby declare that this project work "INTERVIEW CONFIDENCE
LEVEL ANALYSER" submitted to Christ College (Autonomous) Irin-
jalakuda, affiliated to Calicut University in partial fulfillment of the require-
ment for the award of the Bachelor of Computer Science, is a record of original
work done by me, under the guidance of Ms. SOUMYA P S, Department of
computer Science.

Place: Irinjalakuda   DARINE JACOB

ACKNOWLEDGEMENT

First and foremost I like to thank Lord almighty for his providence and for being the guiding light throughout the project. I wish to express my sincere gratitude to our beloved Department head for giving me all the facilities for our project. I take this opportunity to express my gratitude to the class teacher Ms. RASMI P M and head of the department Ms. SINI THOMAS who has been supported me throughout the course of this project. I am thankful for her aspiring guidance and valuable advice during the project work. I express my sincere thanks to my project guide Ms. SOUMYA P.S for supporting and guiding throughout the project.I would take this opportunity to specially thank all other faculty members for their constant and continuous motivation. Finally I would like to thank my family and friends for giving valuable advice and moral support throughout our project.

ABSTRACT

INTERVIEW CONFIDENCE LEVEL ANALYSER is a web application that uses advanced technologies to assess interviewee confidence during video interviews. It uses computer vision techniques to capture real-time video data, including facial landmark detection, to predict interviewee confidence levels. The system's user interface is intuitive and user-friendly, allowing interviewers to customize confidence level thresholds. Real-time feedback is displayed throughout the interview, aiding decision-making and adaptability. The application is designed with ethical considerations in mind, including user authentication, informed consent, and privacy protection. The technology stack ensures scalability, flexibility, and compatibility with various deployment platforms. The application aims to modernize interview assessments, providing valuable insights to improve the hiring process.

Contents

Chapter 1

1 Introduction

The project aims to revolutionize interview evaluation by utilizing computer vision and machine learning to analyse the confidence levels of interviewees through a webcam-based system. The human face is a rich source of non-verbal cues, and movements of the eyes and head can indicate an individual's confidence level during an interview. By leveraging webcam technology, the project aims to capture and interpret these subtle cues in real-time, providing a comprehensive and objective assessment of an interviewee's confidence throughout the interview process.

The methodology involves facial landmark detection algorithms to precisely track the movements of key facial features, such as the eyes and nose. By analysing parameters like blink rate, gaze direction, and head tilt, a machine learning model can be developed capable of discerning patterns associated with varying confidence levels.

This project not only refines the interview assessment process but also addresses the limitations of traditional subjective evaluations. The real-time nature of the approach enables immediate feedback, allowing interviewers to adapt their strategies and create a more conducive environment for candidates. Ethical considerations surrounding the use of personal data and privacy and consent are paramount in the methodology.

1.1 Overview

Machine learning is being used in video interviews to analyse and quantify interviewee confidence levels. By tracking facial landmarks, the system extracts key features like gaze direction, and head tilt. This real-time feedback allows interviewers to adapt their strategies based on objective data. Ethical considerations, informed consent, and privacy protection are integral to the methodology, contributing to the evolution of interview assessment practices. There is a registration and login page. Visual representation of analysis as pie chart and graph are the features we provide. Tips and guidance is also provided.

Chapter 2

2 System Analysis

2.1 Purpose

The ability to assess an interviewee's confidence level is crucial in various domains, including job interviews, psychological evaluations, and public speaking engagements. Traditional methods of gauging confidence often rely on subjective judgments or self-reporting, which can be unreliable. This project proposes a novel approach to assess confidence levels by analysing eye movements and facial expressions captured through a webcam during interviews. By employing computer vision and machine learning techniques, this system aims to provide objective and real-time feedback on the interviewee's confidence, enabling more informed decision-making by interviewers. The project involves the development of algorithms for detecting and interpreting relevant facial cues and eye movements indicative of confidence levels, followed by the implementation of a user-friendly interface for interaction. The effectiveness of the system will be evaluated through experimental studies, comparing its assessments with human judgments and self-reported confidence levels. The outcomes of this project have the potential to enhance interview processes, improve interviewer training, and contribute to advancements in human-computer interaction and affective computing.

2.1.1 Proposed System

The proposed system aims to revolutionize the interview process by introducing a real-time confidence level testing mechanism. Leveraging the capabilities of webcam technology, the system analyses interviewee's eye movements and facial expressions to gauge their confidence levels during the interview. Based on the analysis of facial expressions and eye movements, the system will assign a confidence score to the interviewee, indicating their level of confidence during the interview. The results of the confidence level assessment will be presented visually using bar charts and pie charts. Bar charts can display the distribution of confidence levels among interviewees, while pie charts can show the proportion of different confidence levels.

2.2 Problem definition

To know what the problem is and what the needs are before developing it.

2.3 Feasibility Study

A feasibility study for a project involving the testing of interviewees using a webcam to detect eye movements and facial expressions would typically assess the

---

viability and practicality of such a venture. Testing interviewees using webcam technology to analyse eye movements and facial expressions.

2.3.1 Technical Feasibility

Assessing the availability and reliability of eye tracking and facial expression detection technologies. This may involve researching existing algorithms and software libraries for analyzing eye movements and facial expressions

2.3.2 Economical Feasibility

Estimating the development costs for creating the software or system required for the project. This would include factors such as software development, hardware acquisition, and ongoing maintenance costs. Potential revenue streams could come from offering the system as a service to organizations conducting interviews or through licensing fees.

2.3.3 Operational Feasibility

Conducting user acceptance testing with interviewers to ensure that the system provides accurate results. Training programs may be required to familiarize users with the system and its capabilities. Integration with existing interview processes and workflows would also need to be considered to ensure seamless adoption of the technology.

Chapter 3

3 Software Requirement Specification

3.1 Purpose

The Software Requirements document outlines the functional and non-functional requirements of the "Interview Confidence Level Analyzer" project. It serves as a blueprint for the development team, ensuring a clear understanding of the system's objectives, features, and constraints.

3.2 Scope

The software is designed to analyse interviewee confidence levels during video interviews using computer vision and machine learning techniques. The scope includes real-time feedback provision to interviewers based on facial landmarks, eye movement, and head posture analysis.

3.3 Overall Description

The "Interview Confidence Level Analyzer" is an innovative software system designed to revolutionize the assessment process of interviewee confidence during video interviews. This section provides an overview of the project's perspective, functionality, users and characteristics.

3.3.1 Product Perspective

The "Interview Confidence Level Analyzer" is positioned as a standalone software system designed to operate seamlessly within the context of video interviews. It serves as an innovative addition to traditional interview assessment methods by introducing real-time confidence level analysis through computer vision and machine learning technologies.

3.3.2 Product Functionality

The "Interview Confidence Level Analyzer" is rich in features aimed at providing a comprehensive and objective analysis of interviewee confidence levels as visual representation.

3.3.3 Users and Characteristics

There are two types of users that interact with the webpage are interviewers and interviewees. The users can analyse their confidence level which will be represented as pie chart and bar chart.

Department of Computer Science

IRON PURITY DECTECTION

PROJECT REPORT

Submitted By

MANUEL DEVASSY

Reg. No. CCAVSCS007

for the award of the Degree of

Bachelor of Science (B.Sc.)

in Computer Science
(University of Calicut)

under the guidance of

Ms. Viji Vishwanathan

Assistant Professor

BSc. COMPUTER SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
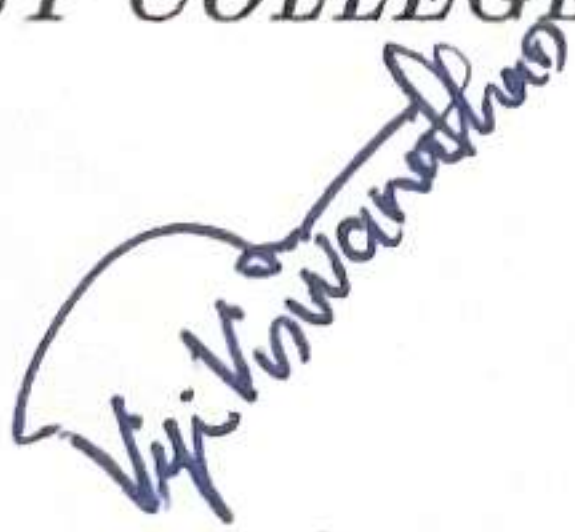CHRIST COLLEGE(Autonomous)
IRINJALAKUDA, KERALA
INDIA

July 2021-2024

DEPARTMENT OF COMPUTER SCIENCE
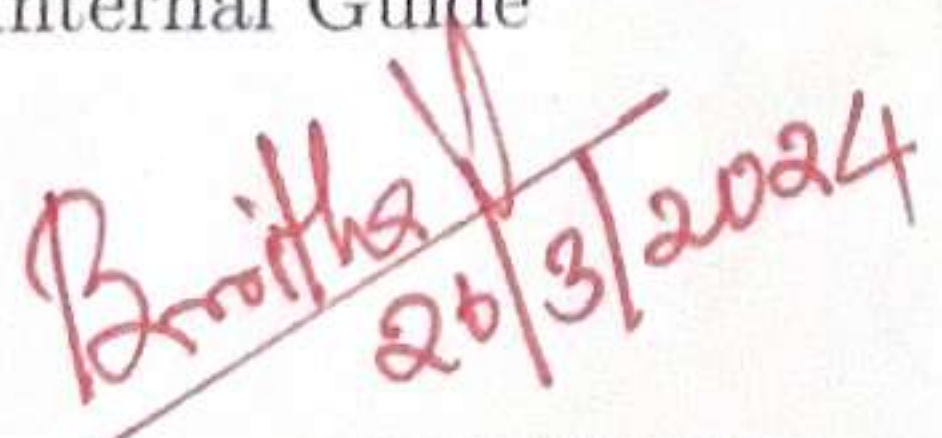## CHRIST COLLEGE (AUTONOMOUS)
IRINJALAKUDA

CERTIFICATE

This is to certify that the project report entitled **"IRON PURITY DE-TECTION"** is a bonafide record of the project work done by **Manuel Devassy** in partial fulfillment of the requirement for the sixth semester of **Bachelor of Computer Science** in Department of Computer Science of **CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

Ms. Viji vishwanathan
Assistant Professor,CS
Internal Guide

Ms. Sini Thomas
Head of the Department
Computer Science

26/3/2024

26/3/24.

EXTERNAL EXAMINER

INTERNAL EXAMINER

DECLARATION

I hereby declare that this project work **"IRON PURITY DETECTION"** submitted to Christ College (Autonomous) Irinjalakuda, affiliated to Calicut University in partial fulfillment of the requirement for the award of the Bachelor of Computer Science, is a record of original work done by us, under the guidance of Ms. VIJI VISWANATHAN, Department of computer Science.

Place: Irinjalakuda

MANUEL DEVASSY

ACKNOWLEDGEMENT

First and foremost i like to thank Lord almighty for his providence and for being the guiding light throughout the project. I wish to express my sincere gratitude to our beloved Department head for giving me all the facilities for our project. I take this opportunity to express my gratitude to the class teacher Ms. RASMI P.M and head of the department Ms. SINI THOMAS who has been supported me throughout the course of this project. I am thankful for her aspiring guidance and valuable advice during the project work. I express my sincere thanks to my project guide Ms. VIJI VISH-WANATHAN for supporting and guiding throughout the project. I would take this opportunity to specially thank all other faculty members for their constant and continuous motivation. Finally I would like to thank my family and friends for giving valuable advice and moral support throughout my project.

ABSTRACT

The project focuses on **IRON PURITY DECTECTION** using machine learning, employing a dataset collected from the site Kaggle. Implemented as a web application, the system utilizes novel detection techniques to classify iron as either pure or impure. This will provide successful application of machine learning for accurate iron purity assessment in an interactive web-based environment.

Contents

Chapter 1

1 Introduction

In industries and manufacturing processes, ensuring the quality and purity of materials is crucial for maintaining product integrity. The "Iron Purity Detection" project addresses the need for a reliable and efficient system to assess the purity of iron samples using advanced regression techniques. This project employs two powerful regression methods: Linear Regression and Stochastic Gradient Descent (SGD) Regression. By leveraging these techniques, we aim to create a robust model capable of predicting the purity of iron samples based on relevant features and attributes.

This dataset is about a flotation plant which is a process used to concentrate the iron ore. This process is very common in a mining plant. The target is to predict the (which is the one hour for the process engineers to have this value. So if it is possible to predict the amount of impurity in the process

Through this project, we not only seek to develop an accurate predictive model but also to contribute to the advancement of quality control processes in industries dealing with iron production. The integration of linear regression and SGD regression offers a comprehensive solution for real-time monitoring and assessment of iron purity, thereby improving overall product quality and reducing operational risks. .

1.1 Overview

The "Iron Purity Detection" project addresses the critical need for accurate and efficient assessment of iron purity in industries involved in iron production, particularly in processes like flotation plants used to concentrate iron ore. The aim is to predict the percentage of silica, an impurity, in the final iron ore concentrate. Given that lab measurements of silica content take considerable time to obtain, the project focuses on developing a predictive model to estimate silica content in real-time during the production process.

To achieve this, the project utilizes advanced regression techniques, specifically Linear Regression and Stochastic Gradient Descent (SGD) Regression. These methods are chosen for their ability to analyze relevant features and attributes of the iron ore samples and make accurate predictions of silica content. By leveraging these techniques, the project aims to create a robust model capable of providing real-time estimates of silica impurity levels, thereby enabling proactive quality control measures in iron production processes.

The integration of Linear Regression and SGD Regression offers a comprehensive solution for monitoring and assessing iron purity, contributing to improved product quality and reduced operational risks in industries dealing with iron production. By providing timely and accurate predictions of silica content, the project not only enhances quality control processes but also drives

efficiency and optimization in iron production operations. Overall, the project's outcomes have the potential to significantly impact the iron production industry by enabling better decision-making and ensuring the integrity of final products.

Chapter 2

2   System Analysis

2.1   Purpose

The purpose of the "Iron Purity Detection" project is to develop a reliable and efficient system for assessing the purity of iron samples in industries involved in iron production. By predicting the percentage of silica, an impurity, in the end product using advanced regression techniques such as Linear Regression and Stochastic Gradient Descent (SGD) Regression, the project aims to provide a tool for real-time monitoring and quality control during the manufacturing process. This contributes to improving product integrity, enhancing quality control processes, and reducing operational risks in industries dealing with iron production.

2.1.1   Existing System

Machine Learning models are created to predict purity of iron. The introductory study includes reviewing the rows, summarizing the columns, basic statistics, data types, and handling missing values. Data preparation and cleaning involve addressing missing values and potential transformations. Exploratory data analysis (EDA) section looks at the independent variables and how it affects the percentage of silica concentrate. Scaling is done using MinMaxScaler and split the data into train and test set using train test split . Model Training:Two regression algorithms are used: Linear Regressor and SGD Regressor algorithms . Trained the model using test data set and predicted the output. Model Evaluation : Calculated the Mean squared error, mean absolute error, and Root mean squared error. Model Prediction : Predicted the percentage of silica by giving new input values. Trained models are saved using pickle..

2.1.2   Proposed System

Iron Purity Detection is done using machine learning algorithms. Here are the key points Data preparation : Data loading and preprocessing using EDA tools like Pandas , Numpy, seaborn, and matplotlib. Algorithms used: 1)Linear Regression : It is a fundamental algorithm in machine learning , commonly usefd for predicting a continuous target variable based on one or more input features. It assumes a linear relationship between the input features and the target variable. The algorithm aims to find the best fit-line that minimizes the difference between the predicted and actual values. The basic steps include defining a linear equation (y = mx + b), determining the coefficients (m and b) through optimization methods like least squares, and using the trained model for predictions. The architecture is straightforward, making it a fundamental tool in regression analysis. 2) SGD Regression : Stochastic Gradient Descent (SGD) Regression is a variant of linear regression that utilizes the stochastic gradient

descent optimization algorithm for training. It updates the model parameters based on a randomly selected subset of the training data (mini-batch) rather than the entire dataset. This stochastic updating helps improve efficiency and scalability. The algorithm seeks to minimize a cost function, often the Mean Squared Error, by iteratively adjusting model coefficients with a learning rate. The stochastic nature of the updates introduces variability, enabling rapid adaptation to changing data patterns. By the careful tuning of hyperparameters, such as learning rate and batch size, is crucial to balance computational efficiency and stable convergence. SGD Regression finds applications in scenarios where processing the entire dataset at once is impractical, making it a valuable tool for large-scale regression problems.

2.2 Problem definition

To know what the problem is and what the needs are before developing it. Here we design a website of Zephyrus for conducting a Techfest in an institution

2.3 FEASIBILITY STUDY

After the problem is clearly understood and solutions proposed, the next step is to conduct the feasibility study. Feasibility study is defined as evaluation or analysis of the potential impact of the proposed project or program. The objective is to determine whether the proposed system is feasible. There are three aspects of feasibility study to which the proposed system is subjected as discussed below.

2.3.1 Technical Feasibility

Technical feasibility assess whether the current technical resources are sufficient for the new system. We can upgrade the level of technology for supporting our website. We check whether the proposed system can be implemented in the present system without supporting the existing hardware.

2.3.2 Economical Feasibility

Economic feasibility determines whether the time and money are available to develop the system. There is no additional hardware used to develop the site, it is inexpensive to build.

2.3.3 Operational Feasibility

Operational feasibility determines if the human resources are available to operate the system once it has been installed. No extra training is needed to use this system. Anyone who has knowledge in internet in english language can easily use the system. The resources that are required to implement or install are already available with the organization.

WITH YOU
MENTAL HEALTH TRACKER

PROJECT REPORT

Submitted By

PALLIKUNNAN JERRY SHAUN

Reg. No. CCAVSCS008

for the award of the Degree of

Bachelor of Science (B.Sc.)

in Computer Science
(University of Calicut)

under the guidance of

Ms. Rasmi P M

Assistant Professor

BSc. COMPUTER SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE(Autonomous)
IRINJALAKUDA, KERALA
INDIA

March 2024

DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE (AUTONOMOUS)
IRINJALAKUDA

CERTIFICATE

This is to certify that the project report entitled *"With You - Mental Health Tracker"* is a bonfied record of the project work done by ***Pallikunnan Jerry Shaun*** in partial fulfillment of the requirement for the sixth semester of ***Bachelor of Computer Science*** in Department of Computer Science of **CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**.

Ms. Rasmi P M
Assistant Professor,CS
Internal Guide

Ms. Sini Thomas
Head of the Department
Computer Science

EXTERNAL EXAMINER

INTERNAL EXAMINER

DECLARATION

I hereby declare that this project work **"WITH YOU - MENTAL HEALTH TRACKER."** submitted to Christ College (Autonomous) Irinjalakuda, affiliated to Calicut University in partial fulfillment of the requirement for the award of the Bachelor of Computer Science, is a record of original work done by us, under the guidance of Ms. RASMI P M, Department of Computer Science.

Place: Irinjalakuda   PALLIKUNNAN JERRY SHAUN

ACKNOWLEDGEMENT

ABSTRACT

MENTAL HEALTH TRACKER APP application aims to empower users to monitor their mental health status, track mood fluctuations, identify potential triggers, and access resources for support. Key features include mood tracking, and personalized recommendations based on user input and behavioral patterns. Utilizing data analytics and machine learning algorithms, the application will offer insights into users' mental health trends over time, enabling them to make informed decisions regarding self-care and seek professional help if needed.

Contents

AUDIO TO SIGN LANGUAGE TOOL

PROJECT REPORT

Submitted By

PATHIAPARAMBIL JENSON JOSE

Reg. No. CCAVSCS009

for the award of the Degree of

Bachelor of Science (B.Sc.)

in Computer Science
(University of Calicut)

under the guidance of

Ms. Varsha Ganesh

Assistant Professor

BSc. COMPUTER SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE (AUTONOMOUS)
IRINJALAKUDA, KERALA
March 2024

DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE (AUTONOMOUS)
IRINJALAKUDA

CERTIFICATE

This is to certify that the project report entitled **"AUDIO TO SIGN LANGUAGE TOOL"** *is a bonfied record of the project work done by* **Pathiaparambil Jenson Jose** *in partial fulfillment of the requirement for the sixth semester of* **Bachelor of Computer Science** *in Department of Computer Science of* **CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

Ms. Varsha Ganesh
Assistant Professor
Internal Guide

26/03/24

Ms. Sini Thomas
Head of Department
Computer Science

EXTERNAL EXAMINER

INTERNAL EXAMINER

DECLARATION

I hereby declare that this project work "**AUDIO TO SIGN LAN-GUAGE TOOL**" submitted to Christ College (Autonomous) Irinjalakuda, affiliated to Calicut University in partial fulfillment of the requirement for the award of the Bachelor of Computer Science, is a record of original work done by me, under the guidance of Ms. VARSHA GANESH, Department of computer Science.

Place: Irinjalakuda   PATHIAPARAMBIL JENSON JOSE

ACKNOWLEDGEMENT

First and foremost I like to thank Lord almighty for his providence and for being the guiding light throughout the project. I wish to express my sincere gratitude to our beloved Department head for giving me all the facilities for our project. I take this opportunity to express my gratitude to the class teacher Ms RASMI PM and head of the department Ms SINI THOMAS who has been supported us throughout the course of this project. I'm thankful for her aspiring guidance and valuable advice during the project work. I express my sincere thanks to my project guide Ms VARSHA GANESH for supporting and guiding throughout the project. I would take this opportunity to specially thank all other faculty members for their constant and continuous motivation. Finally, I would like to thank my family and friends for giving valuable advice and moral support throughout our project.

ABSTRACT

Audio to Sign Language Tool is introduced to address communication barriers faced by individuals who are deaf or hard of hearing by providing a web-based platform that converts spoken language into sign language animations. Leveraging technologies such as natural language processing (NLP), speech recognition, and 3D animation tools like Blender, the project facilitates communication accessibility and inclusivity for users with diverse communication needs. Through an intuitive user interface, users can input audio, view corresponding sign language animations, and provide feedback, fostering greater understanding and engagement. The project represents an innovative and impactful initiative in leveraging technology to promote communication accessibility and inclusivity for individuals with hearing impairments.

Contents

Chapter 1

1   Introduction

In recent years, there has been a growing interest in developing technologies that bridge the communication gap between individuals who are deaf or hard on hearing and those who can hear. One such technology is the Audio to Sign Language Tool, which aims to translate spoken language into sign language gestures in real-time. This innovative solution can enhance communication and facilitate effective interaction between hearing and deaf individuals. The Audio to Sign Language Tool leverages the power of machine learning and computer vision techniques to analyse spoken language and generate corresponding sign language gestures. Python, a popular programming language, provides a flexible and efficient platform for implementing this converter. By utilizing Python libraries and frameworks, we can create a robust and accurate system that can recognize and interpret spoken language and generate the appropriate sign language output. The key components of the Audio to Sign Language Converter system include: Speech Recognition, Natural Language Processing (NLP), User Interface, Lemmatization, Stop words, Tokenization, Characterization, Speech API, NLP toolkit, localhost, Hand Gestures, Sign Language

1.1   Overview

Our objective is to help people suffering from the problem of hearing. The Audio to Sign Language Tool holds great potential to improve communication accessibility for individuals with hearing impairments. By utilizing Python and its rich ecosystem of libraries and frameworks, we can develop a sophisticated and effective system that converts spoken language into sign language gestures in real-time. This technology has the potential to bridge the communication gap and enhance inclusivity for individuals who are deaf or hard of hearing in various domains, including education, healthcare, and everyday social interactions.

Chapter 2

2 System Analysis

2.1 Purpose

The main purpose of the "Audio to Sign Language Tool" website is to facilitate communication between individuals who are deaf or hard of hearing and those who can communicate verbally. The website serves as a platform where users can input audio messages, which are then converted into sign language animations. This conversion allows individuals who use sign language to understand and respond to the spoken messages effectively.

2.1.1 Existing System

Existing models for audio and text-to-sign language translation offer valuable insights into this field, although they predominantly concentrate on American Sign Language (ASL), leaving a notable gap for Indian Sign Language (ISL) solutions. These models, such as Ankita Harkude and her team's audio-to-ISL converter and Oi Mean Fang's speech-to-sign language system for Malaysians, showcase various approaches but often face limitations, including complexity and reduced accuracy. Khalid Khalil's ASL interpreter system using Sphinx 3.5 Speech Recognition and Ezhumalai P's text-to-ASL translator reveal further diversity in methodologies. Limitations of existing system: Existing sign language conversion models primarily focus on American Sign Language (ASL), which doesn't cater to the unique needs of Indian Sign Language (ISL) users.

2.1.2 Proposed System

To enhance the accessibility and understanding of deaf and hearing-impaired individuals, we plan to use animations, making the output visually appealing and interactive. This system will bridge the communication gap by providing ISL representations, addressing the specific needs of the Indian community. The workflow involves capturing audio input, converting it to text, processing it using Natural Language Processing (NLP) techniques, and generating ISL animations using Blender 3D animation tools. This approach not only offers a novel solution but also focuses on enhancing the quality of communication for the hearing-impaired. Advantages of proposed system Improved Educational Opportunities, Employment Inclusivity, Wider Information Access, Independence and Autonomy, Local Indian languanges also can be coverted. Audio file which is uploaded by the user can be also convert to ISL.

2.2 Problem definition

To know what the problem is and what the needs are before developing it. Here we design a website of Audio to sign language converter for deaf people.

2.3 Feasibility Study

After the problem is clearly understood and solutions proposed, the next step is to conduct the feasibility study. Feasibility study is defined as evaluation or analysis of the potential impact of the proposed project or program. The objective is to determine whether the proposed system is feasible. There are three aspects of feasibility study to which the proposed system is subjected as discussed below.

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Chapter 3

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3.1 Purpose

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3.2 Scope

Our project has made it easier for normal people to communicate with deaf people easily and systematically. This encompasses the development of a versatile language conversion system that supports English, Malayalam, and Hindi languages initially, with provisions for future expansion to include more languages. Future directions may include expanding language support, enhancing user customization options, and integrating feedback mechanisms for continuous improvement. Sign language translator can be used in schools, colleges, hospitals, universities, airports, courts. Anywhere anyone can use this system for understanding the sign language to communicate. The future work is to develop an application where in the news channels can use it while giving news, in one corner of the screen it will be displayed in sign language for deaf people.

3.3 Overall Description

This section give an overview of our website, AUDIO TO SIGNLANGUAGE TOOL. This project is designed for deaf people. This system enables users to register and login to the system. It also enables the users to speech and view the corresponding Sign Language generation. The user can speech through either Hindi, English or Malayalam.

3.3.1 Product Perspective

AUDIO TO SIGNLANGUAGE TOOL is mainly used for effective communication between normal people and deaf people. The users can speech or text and corresponding SignLanguage will be generated by animation. The users can also upload the audio files which can also be converted.

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Through this system users can register and login to the system. Users can speech, text or upload the audio files which are needed to be converted. Users are

STOCK PRICE PREDICITON

PROJECT REPORT

Submitted By

SONAL POULOSE
Reg. No. CCAVSCS010

For the award of the Degree of

Bachelor of Science (B.Sc.)

in Computer Science
(University of Calicut)

under the guidance of

Ms. Sini Thomas
Head Of the Department

B.Sc. COMPUTER SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE
IRINJALAKUDA, KERALA
March 2024

DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE (AUTONOMOUS)
IRINJALAKUDA

CERTIFICATE

This is to certify that the project report entitled *"Stock Price Prediction"* is a bonafide record of the project work done by **Sonal Poulose** in partial fulfillment of the requirement for the sixth semester of **Bachelor of Computer Science** in Department of Computer Science of **CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

Ms. Sini Thomas
Head Of the Department
Internal Guide

26/03/2024

EXTERNAL EXAMINER

Ms. Sini Thomas
Head Of the Department
Computer Science

26/3/24.

INTERNAL EXAMINER

DECLARATION

I hereby declare that this project work "STOCK PRICE PREDICTION" submitted to Christ College (Autonomous) Irinjalakuda, affiliated to Calicut University in partial fulfillment of the requirement for the award of the Bachelor of Computer Science, is a record of original work done by me, under the guidance of Ms. SINI THOMAS, Department of computer Science.

PLACE : IRINJALAKUDA

SONAL POULOSE

ACKNOWLEDGEMENT

First and foremost I would like to thank Lord almighty for his providence and for being the guiding light throughout the project. I wish to express sincere gratitude to my beloved Department head for giving me all the facilities for my project. I take this opportunity to express gratitude to my class teacher Ms. RASMI P.M , my scholar hub guide PRIYANGA K.K and my Head Of the Department Ms. SINI THOMAS who has supported me throughout the course of this project. I am thankful for her aspiring guidance and valuable advice during the project work. I express sincere thanks to my project guide Ms. SINI THOMAS for supporting and guiding throughout the project. I would take this opportunity to specially thank all other faculty members for their constant and continuous motivation. Finally I would like to thank my family and friends for giving valuable advice and moral support throughout my project.

ABSTRACT

STOCK PRICE PREDICITION is a system that aims to predict the future value of the financial stocks of a market. The recent trend in stock market prediction technologies is to use of machine learning which makes predictions based on the values of current stock market indices by training on their previous values. Machine learning itself employs different models to make predictions easier and authentic. This documentation focuses on the use of LSTM- LONG SHORT TERM MEMORY based Machine learning to predict stock values. Factors considered are open,close,low,high,adjacent value and volume.

Contents

Chapter 1

1   INTRODUCTION

The world of finance has long been captivated by the elusive quest for accurate stock prediction. In recent years, advancements in technology and data analytics have revolutionized this pursuit, offering unprecedented opportunities for investors and researchers alike. This project delves into the realm of stock prediction, employing cutting-edge machine learning algorithms and statistical techniques to forecast the future movements of various stocks. By analyzing historical data, market trends, and a plethora of other factors, this report aims to provide a comprehensive overview of the methodologies, challenges, and outcomes associated with stock prediction in today's dynamic financial landscape. Through meticulous analysis and interpretation, this study endeavors to shed light on the complexities of stock markets and offer insights that can inform decision-making processes for investors and financial institutions Accurate prediction of stock prices plays an increasingly prominent role in the stock market where returns and risks fluctuate wildly, and both financial institutions and regulatory authorities have paid sufficient attention to it. As a method of asset allocation, stocks have always been favored by investors because of their high returns. The research on stock price prediction has never stopped. In the early days, many economists tried to predict stock prices. Later, with the in-depth research of mathematical theory and the vigorous development of computer technology, people have found that the establishment of mathematical models can be very good, such as time series model, because its model is relatively simple and the forecasting effect is better. Time series model is applied in a period of time The scope gradually expanded. However, due to the non-linearity of stock data, some machine learning methods, such as support vector machines. Later, with the development of deep learning, some such as RNN, LSTM neural Networks, they can not only process non-linear data, but also retain memory for the sequence and retain useful information, which is positive. It is required for stock data forecasting. This article introduces the theoretical knowledge of time series model and LSTM neural network, and select real stocks in the stock market, perform modeling analysis and predict stock prices, and then use the root mean square error to compare the prediction results of several models. Since the time series model cannot make good use of the non-linear part of the stock data, can't perform long-term memory, and LSTM neural network makes better use of non-linear data and has better use of sequence data. Useful information in the long-term memory, which makes the root mean square error of the prediction result, the LSTM neural network needs smaller than the time series model, indicating that LSTM neural network is a better stock price forecasting method. The time series for stock prices belong to non-stationary and non-linear data, making the prediction of future price trends extremely challenging. In order to learn the long-term dependence of stock prices, deep learning methods such as the LSTM method are used to obtain longer data dependence and overall

change patterns of the stocks.

1.1 Overview

The objective of stock price predictions is to provide investors and traders with insights into potential future movements in stock prices, enabling them to make informed decisions. By analyzing historical data and employing various statistical and machine learning techniques, stock price prediction models aim to forecast the direction and magnitude of price changes over different time horizons. These predictions serve several purposes, including guiding investment decisions, managing risk, optimizing portfolios, and devising trading strategies. Ultimately, the goal is to leverage predictive analytics to enhance financial decision-making and achieve desired investment outcomes in dynamic and uncertain market

1.2 Stock Market

A stock market, equity market or share market is the aggregation of buyers and sellers (a loose network of economic transactions, not a physical facility or discrete entity) of stocks (also called shares), which represent ownership claims on businesses; these may include securities listed on a public stock exchange as well as those only traded privately. Examples of the latter include shares of private companies which are sold to investors through equity crowd funding platforms. Stock exchanges list shares of common equity as well as other security types, e.g. corporate bonds and convertible bonds. Stock price prediction is one of the most widely studied problem, attracting researchers from many fields. The volatile nature of the stock market makes it really difficult to apply simple time-series or regression techniques. Financial institutions and active traders have created various proprietary models to beat the market for themselves or their clients, but rarely did anyone achieve consistently higher than the average returns on investment. The challenge of stock market price forecasting is so appealing because an improvement of just a few points of percentage can increase the profit by millions of dollars. This paper discusses the application of Support Vector Machines and Linear Regression in detail along with the pros and cons of the given methods.

1.3 LSTM - Long Short Term Memory

LSTM networks are an extension of recurrent neural networks (RNNs) mainly introduced to handle situations where RNNs fail.

- It fails to store information for a longer period of time. At times, a reference to certain information stored quite a long time ago is required to predict the current output. But RNNs are absolutely incapable of handling such "long-term dependencies".

- There is no finer control over which part of the context needs to be carried forward and how much of the past needs to be 'forgotten'.

- Other issues with RNNs are exploding and vanishing gradients (explained later) which occur during the training process of a network through back-tracking.

Thus, Long Short-Term Memory (LSTM) was brought into the picture. It has been so designed that the vanishing gradient problem is almost completely removed, while the training model is left unaltered. Long-time lags in certain problems are bridged using LSTMs which also handle noise, distributed representations, and continuous values. With LSTMs, there is no need to keep a finite number of states from beforehand as required in the hidden Markov model (HMM). LSTMs provide us with a large range of parameters such as learning rates, and input and output biases.

1.4 Time Series Model

Stationary time series are divided into strictly stationary time series and wide stationary time series. Below we introduce their definitions. Strictly stationary time series provide important theoretical significance, but it is difficult to obtain the joint distribution of random sequences in the actual research process. Therefore, in order to better use in practical applications, researchers have defined a relatively weak wide stationary time sequence. Researchers choose to use the characteristic statistics of the sequence to define wide stationarity, which can make the constraint conditions a little looser. By ensuring the stationarity of the low-order moments of the sequence to ensure that the sequence can be approximately stationary. Time series analysis also belongs to the field of statistics. It can also analyze the population through samples like statistics. And from the statistical theorems, we can know that the number of random variables is directly proportional to the complexity of the analysis, and the sample size is inversely proportional to the accuracy of obtaining the overall information (obviously the sample information obtained when the population is selected as the sample is Overall information, but such an operation is obviously unrealistic). But time series data has its peculiarities. For a time series $\cdots$, X1, X2, $\cdots$, Xt, $\cdots$, its value Xt at any time t is a random variable, and since time is one-way, it cannot be repeated , So we can only get one sample value in this way, which leads to too little sample information for statistical analysis. But if we have the concept of stationarity, this problem will be solved.

Chapter 2

2   SYSTEM ANALYSIS

2.1   Purpose

The main purpose of stock price predictions is to assist investors and traders in making informed decisions about buying, selling, or holding stocks. These predictions aim to provide insights into the potential future movements of stock prices, helping individuals and institutions navigate the complexities of the financial markets and optimize their investment strategies

2.1.1   Existing System

The existing system for stock price prediction typically involves traditional statistical methods, such as moving averages, ARIMA (AutoRegressive Integrated Moving Average), and other time series forecasting techniques. These methods often rely on historical price data and assume certain patterns in the data to make predictions. Limitations of Existing System: The traditional methods may struggle to capture complex patterns and dependencies present in financial time series data.

2.1.2   Proposed System

The proposed system is to use LSTM for prediction. The limitation of the existing system is overcome by LSTM, a type of recurrent neural network (RNN). LSTM is particularly effective for handling long-range dependencies and capturing intricate patterns in sequential data, making it well-suited for stock price prediction. Advantages of Proposed System : LSTM-based models can learn from historical data with memory capabilities, allowing them to adapt to changing market conditions and capture subtle trends that may not be evident with simpler techniques.

2.2   Problem definition

To know what the problem is and what the needs are before developing it. Here we design a model to predict the stock price of a market.

2.3   Feasibility Study

After the problem is clearly understood and solutions proposed, the next step is to conduct the feasibility study. Feasibility study is defined as evaluation or analysis of the potential impact of the proposed project or program. The objective is to determine whether the proposed system is feasible. There are three aspects of feasibility study to which the proposed system is subjected as discussed below.

FOREST FIRE DETECTION

PROJECT REPORT

Submitted By

PARVATHY KURUPPATH

Reg. No. CCAVSCS031

for the award of the Degree of

Bachelor of Science (B.Sc.)

in Computer Science
(University of Calicut)

under the guidance of

Ms. Priyanga K K

Assistant Professor

BSc. COMPUTER SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE(Autonomous)
IRINJALAKUDA, KERALA
INDIA
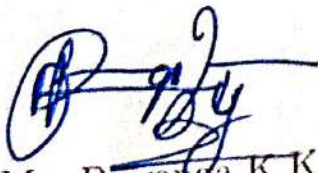
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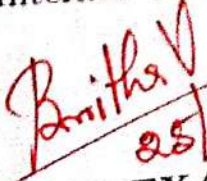
DEPARTMENT OF COMPUTER SCIENCE

CHRIST COLLEGE (AUTONOMOUS)

IRINJALAKUDA
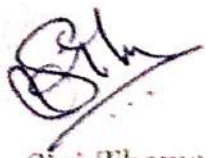
CERTIFICATE

This is to certify that the project report entitled "FOREST FIRE DE-TECTION" is a bonfied record of the project work done by **Parvathy Kuruppath** in partial fulfillment of the requirement for the sixth semester of **Bachelor of Computer Science** in Department of Computer Science of CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA

Ms. Priyanga K K
Assistant Professor,CS
Internal Guide

Ms. Sini Thomas
Head of the Department
' Computer Science

25/03/2024

EXTERNAL EXAMINER

INTERNAL EXAMINER

DECLARATION

I hereby declare that this project work "FOREST FIRE DETEC-TION" submitted to Christ College (Autonomous) Irinjalakuda, affiliated to Calicut University in partial fulfillment of the requirement for the award of the Bachelor of Computer Science, is a record of original work done by me, under the guidance of Ms.PRIYANGA K K, Department of computer Science.

PARVATHY KURUPPATH

Place: Irinjalakuda

ACKNOWLEDGEMENT

First and foremost I like to thank Lord almighty for his providence and for being the guiding light throughout the project. I wish to express my sincere gratitude to my beloved Department head for giving me all the facilities for my project. I take this opportunity to express my gratitude to the class teacher Ms.RASMI P M and head of the department Ms.SINI THOMAS who has been supported us throughout the course of this project. I am thankful for her aspiring guidance and valuable advice during the project work. I express my sincere thanks to my project guide Ms.PRIYANGA K K for supporting and guiding throughout the project.I would take this opportunity to specially thank all other faculty members for their constant and continuous motivation. Finally I would like to thank my family and friends for giving valuable advice and moral support throughout my project.

ABSTRACT

In contemporary applications, the imperative nature of effective fire detection is evident in ensuring the safety and security of diverse domains such as video surveillance and safety infrastructure. This project introduces an innovative hybrid approach that seamlessly integrates the interpretability of traditional machine learning models with the intricate feature extraction capabilities of deep learning, aiming to achieve a nuanced and high-performance fire detection system. By combining the strengths of both paradigms, the proposed approach addresses the complexities inherent in fire detection tasks

Contents

Chapter 1

1 Introduction

Fire incidents pose significant threats to individuals, communities, and the environment. The severity of these threats can vary depending on the nature of the fire, its location, and the response capabilities in place.The ability to detect fires in videos has emerged as a critical imperative for facilitating early intervention and effective mitigation strategies. This project serves as a vanguard, introducing an innovative and technologically advanced approach to fire detection in videos and images through the application of machine learning techniques and deep learning techniques. In the realm of video surveillance, the ubiquity of camera systems has soared, making it increasingly imperative to harness these systems to bolster the rapidity and efficacy of fire detection. The motivation behind this research stems from the recognition that conventional fire detection methods often fall short in swiftly identifying emerging fire threats. Leveraging video data offers a unique opportunity to address this pressing issue, as it can provide a visual stream of information that can be analysed in real-time. However, the endeavour of fire detection in video data is not without its multifaceted challenges. Videos are inherently dynamic and complex, replete with intricate visual details and often significant variations in lighting, weather conditions, and perspectives. Distinguishing between normal activities and the onset of a fire event can be a formidable task. .

1.1 Overview

Additionally, the stakes are exceptionally high in fire detection, as delayed or inaccurate detection can lead to catastrophic consequences, including loss of life, extensive property damage, and environmental degradation. To address these formidable challenges, this research embarks on a pioneering journey into the realm of machine learning. Machine learning, a subfield of artificial intelligence, offers the promise of automating the process of fire detection in videos, potentially revolutionizing the field of fire safety. By training machine learning models to recognize the distinctive visual patterns associated with fires, it becomes possible to create an efficient and accurate fire detection system. The primary objective of this research is crystal clear: to develop a fire detection system for videos that is not only efficient but also highly accurate. Such a system could serve as an invaluable tool for public safety, as it has the potential to drastically reduce response times when fires break out. The importance of early fire detection cannot be overstated, as it can mean the difference between containing a fire in its nascent stage and grappling with an uncontrolled inferno. As we delve deeper into the subsequent sections of this paper, we will unravel the intricate steps and methodologies involved in achieving this ambitious objective. We will explore the nuances of data collection, highlighting the importance of

creating a diverse dataset of videos containing both fire and non-fire scenarios. We will delve into the intricacies of data preprocessing, which involves tasks such as frame extraction, feature extraction, and data format conversion, all of which are essential for rendering video data amenable to machine learning analysis. The core of our approach revolves around the design and training of a machine learning model, such as a convolutional neural network (CNN) or recurrent neural network (RNN), tailored explicitly for fire detection. These models will be endowed with the ability to sift through vast streams of video data in real-time, distinguishing between benign scenes and the critical emergence of a fire.

Chapter 2

2 System Analysis

2.1 Purpose

The overarching purpose of the Fire Detection project lies in addressing the imperative need for an advanced, automated system capable of real-time fire detection. This purpose emerges from the recognition of the limitations within the existing manual fire detection processes and aims to harness the synergy of Convolutional Neural Networks (CNN)and understand the specific needs and objectives of stakeholders, including government agencies, environmental organizations, and communities, regarding forest fire detection and management.

2.1.1 Existing System

- Machine Learning models are created to detect fire.

- Randomforest and knn models are created.

- Training Data:The training data is loaded using the ImageDataGenerator from the Keras library.

- The training data is organized in two directories: one for training and validation (Training and Validation), and another for testing (Testing).

- The script assumes a binary classification task with classes labeled as 0 (No Fire) and 1 (Fire).

- Model Training:Two classifiers are used: Random Forest and k-Nearest Neighbors (KNN).

- The classifiers are trained on flattened images obtained from the training dataset.

- Trained models are saved using joblib.

2.1.2 Proposed System

- Forest fire Detection is done using Convolutional Neural Network (CNN) using the TensorFlow and Keras libraries. Here's an overview of the key components:

- Data Preparation:Image data is loaded using ImageDataGenerator from directories containing training and testing images.

- The images are resized to (150, 150) pixels and normalized by rescaling pixel values to the range [0, 1].

- CNN Model Architecture: A sequential model is created with the following layers:

- Convolutional layer with 32 filters, kernel size (3,3), and ReLU activation.

- MaxPooling layer with a pool size of (2,2).

- Additional convolutional and max-pooling layers to capture hierarchical features.

- Flattening layer to convert the 2D feature maps to a 1D vector.

- Fully connected Dense layer with 512 units and ReLU activation.

- Output layer with a single neuron and sigmoid activation for binary classification.

2.2 Problem definition

The existing manual processes for fire detection present a myriad of challenges that underscore the critical need for a technological solution. The key issues identified in the current system include:

- Time Inefficiency: The reliance on manual inspection for fire detection introduces a significant time lag in identifying potential threats. Human operators must painstakingly review images and videos, leading to delays that could prove detrimental in emergency situations. The inefficiency of the manual process underscores the necessity for an automated system that can rapidly analyse and respond to fire-related incidents.

- Potential for Delayed Response: The manual nature of the existing system increases the risk of delayed responses during critical situations. The time taken to visually inspect each image or video introduces a variable that could impact the effectiveness of emergency response measures. A delayed response poses a serious threat to both property and lives, emphasizing the need for a more prompt and automated fire detection system.

- Human Reliance and Oversight: Relying solely on human intervention for fire detection introduces the inherent risk of oversight or errors. Human operators may miss subtle signs of fire, leading to false negatives or delayed detections. The potential for oversight in a manual system compromises the reliability and accuracy of fire safety measures, necessitating a more robust and foolproof solution.

- Lack of Integration of Advanced Technologies: The absence of a dedicated system that integrates advanced image processing and machine learning exacerbates the challenges in the existing fire detection process. The manual approach lacks the capability to harness the potential of technologies like Convolutional Neural Networks (CNNs) for efficient feature extraction and pattern recognition. This technological gap underscores the need

for a more sophisticated system that can leverage these advancements for improved accuracy and speed in fire detection.

2.3 Feasibility Study

After the problem is clearly understood and solutions proposed, the next step is to conduct the feasibility study. Feasibility study is defined as evaluation or analysis of the potential impact of the proposed project or program. The objective is to determine whether the proposed system is feasible. There are three aspects of feasibility study to which the proposed system is subjected as discussed below.

2.3.1 Technical Feasibility

Assessing the technical feasibility of a project involves evaluating whether the proposed solution can be effectively developed and implemented given the available technology, resources, and expertise. Here's an analysis of the technical feasibility of the forest fire detection project:

- Feasibility: Determine if sufficient satellite imagery data of forested areas are available for training and testing the CNN model.

- Quality: Assess the quality of the available data, including spatial and spectral resolution, coverage, and consistency over time.

2.3.2 Economical Feasibility

Evaluating the economic feasibility of a project involves assessing whether the expected benefits of the project outweigh its costs. Here's an analysis of the economic feasibility of the forest fire detection project:

- Development Costs: This includes expenses related to data collection, preprocessing, model development, and software engineering. It involves salaries of data scientists, machine learning engineers, and software developers, as well as costs for computing resources and software tools.

- Infrastructure Costs: Expenses for setting up and maintaining the necessary infrastructure for data storage, model training, and deployment, such as servers, cloud services, and networking equipment.

- Training Costs: Costs associated with training personnel involved in data annotation, model development, and system deployment.

- Operational Costs: Ongoing expenses for system maintenance, data acquisition, and monitoring, including salaries for operational staff, cloud service subscriptions, and data acquisition fees.

2.3.3 Operational Feasibility

Assessing the operational feasibility of a project involves evaluating whether the proposed solution can be effectively integrated into existing operations and processes. Here's an analysis of the operational feasibility of the forest fire detection project:

- Training and Support: Provide training and support to users to familiarize them with the system's operation, interpretation of results, and response protocols.

- Workflow Integration: Integrate the forest fire detection system into existing workflows and procedures for forest monitoring, fire prevention, and emergency response.

- Infrastructure Scalability: Ensure that the underlying infrastructure, including servers, storage, and network resources, can scale up or down to meet changing operational needs.

- Operational Costs: Assess the operational costs associated with deploying and maintaining the forest fire detection system, including personnel, infrastructure, data acquisition, and ongoing support.

AI-POWERED VIRTUAL TUTOR

PROJECT REPORT

Submitted By

RAHNA P.A

Reg. No. CCAVSCS032

for the award of the Degree of

Bachelor of Science (B.Sc.)

in Computer Science
(**University of Calicut**)

under the guidance of

Mr.Joju Sebastian

Assistant Professor

BSc. COMPUTER SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE(Autonomous)
IRINJALAKUDA, KERALA
INDIA

March 2024

DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE (AUTONOMOUS)
IRINJALAKUDA

CERTIFICATE

This is to certify that the project report entitled *"Ai-Powered Virtual Tutor"* is a bonafide record of the project work done by *RAHNA P.A* in partial fulfillment of the requirement for the sixth semester of *Bachelor of Computer Science* in Department of Computer Science of *CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA*

Mr.Joju Sebastian
Assistant Professor,CS
Internal Guide

Ms. Sini Thomas
Head of the Department
Computer Science

EXTERNAL EXAMINER

INTERNAL EXAMINER

DECLARATION

I hereby declare that this project work "**AI-POWERED VIRTUAL TUTOR**" submitted to Christ College (Autonomous) Irinjalakuda, affiliated to Calicut University in partial fulfillment of the requirement for the award of the Bachelor of Computer Science, is a record of original work done by me, under the guidance of Mr.JOJU SEBASTIAN, Department of Computer Science.

Place: Irinjalakuda

RAHNA P.A

ACKNOWLEDGEMENT

ABSTRACT

AI-Powered Virtual Tutor is an web application designed to revolutionize learning experiences. The application is enriched with two kind of login facilities - admin login, user login. It conducts assessments through seamless integration with various subjects, students can access a comprehensive platform that fosters knowledge acquisition and skill development. The main features are - users can benefit from tailored lessons, real-time feedback and it allows them to track their progress. admin can register users, upload content, update website related activities and so on. All these features make this website more adaptable and user-friendly.

Contents

Chapter 1

1 Introduction

Welcome to our project on AI-powered Virtual Tutor, where learning meets innovation! Experience a transformative approach to education as we analyze your knowledge through interactive tests.In the contemporary realm of education, the integration of artificial intelligence has heralded a paradigm shift in pedagogical approaches, ushering in an era where traditional teaching methods are augmented by the capabilities of cutting-edge technology. A pinnacle manifestation of this transformation is witnessed in the emergence of AI-powered virtual tutors, sophisticated educational tools that go beyond conventional boundaries. This not only assess student's knowledge but also to provide nuanced and tailored guidance. The fundamental premise of these AI-powered virtual tutors revolves around their ability to conduct comprehensive assessments of student's understanding and proficiency across various subjects. By employing intricate algorithms, these digital tutors can analyze vast datasets, discern patterns, and evaluate a student's grasp of diverse concepts. This analytical prowess allows for a nuanced understanding of individual learning trajectories, going beyond standardized assessments to provide a more holistic view of a student's academic strengths and areas that warrant further attention. However, the true innovation lies in the personalized guidance these virtual tutors offer based on the insights gleaned from assessments. Tailored to each student's unique learning profile, these AI-powered mentors can pinpoint specific areas of improvement, recommend targeted resources, and even adapt the learning pace to accommodate individual needs. This level of personalization transcends the limitations of one-size-fits-all approaches, fostering an environment that nurtures each student's intellectual growth. As we delve deeper into the intricate capabilities of AI-powered virtual tutors, it becomes apparent that they serve as more than mere evaluators. They evolve into dynamic guides, steering students through their academic journeys with precision and adaptability. This aims to unravel the layers of this transformative technology, exploring its impact on student assessment and the provision of personalized guidance, ultimately shedding light on the profound implications it holds for the future of education.

1.1 Overview

The main aim of our AI-powered Virtual Tutor project is to revolutionize the education landscape by providing a personalized and adaptive learning experience for students. The cornerstone of our ambitious endeavor lies in the profound transformation of the educational landscape through the deployment of our AI-powered Virtual Tutor. At its core, this visionary project seeks to revolutionize traditional teaching methodologies by providing a learning experience that is not only personalized but also adaptive to the unique needs and learning styles

of individual students. The overarching objective is to propel students towards a deeper understanding and mastery of various subjects, with a specialized emphasis on programming languages like Python, HTML, and PHP. With an unwavering commitment to enhancing educational outcomes, our Virtual Tutor endeavors to usher in a new era where learning is not a one-size-fits-all endeavor but rather a dynamic and tailored experience. The focal point of our efforts is to address the intricacies of programming education, acknowledging that each student possesses distinctive strengths and areas requiring improvement. By tailoring content and guidance to these individual needs, our Virtual Tutor aims to bridge educational gaps and cultivate a holistic understanding of complex subjects. Central to the efficacy of our AI-powered Virtual Tutor is its proficiency in offering personalized guidance and real-time feedback. Gone are the days of passive learning, as our system actively engages with students, adapting its approach based on real-time assessments. This responsiveness ensures that students receive immediate insights into their progress, allowing for a continuous cycle of improvement. Through this interactive feedback loop, the Virtual Tutor becomes not just an instructor but a mentor, guiding students towards programming excellence. Imagine a world where mastering programming languages is not only a pedagogical exercise but an intuitive, engaging journey uniquely tailored to your skills. Our Virtual Tutor provides this transformative experience, transcending the conventional boundaries of education. It invites students to embrace a smarter way of learning, where the intricacies of programming are demystified, and the path to excellence becomes navigable through personalized guidance. In the pages that follow, we will delve into the intricate details of this revolutionary project, exploring how it redefines education and serves as the key to unlocking the door to programming mastery.

Chapter 2

2 System Analysis

2.1 Purpose

The purpose of our AI-powered Virtual Tutor is twofold: to accommodate the diverse learning speeds of students and to provide comprehensive support for both fast and slower learners, particularly in the context of programming education. This practical application of knowledge encourages a deeper understanding of programming concepts and enhances real-world problem-solving skills. The Virtual Tutor adapts to their quick comprehension, preventing boredom or stagnation often experienced in traditional, one-size-fits-all learning environments. The ultimate goal is to empower every student to succeed and thrive in their programming journey.

2.1.1 Existing System

The existing system of AI-powered systems can analyze a student's strengths ,learning styles and creating tailored learning experiences through conducting tests. it provides instantaneous feedback to students and guiding them.it adapt to different learning styles , It also provides chatbot for instant assistance to students, answer common questions. These tools suggest additional learning resources, such as videos, or exercises based on a student's progress and interests.

2.1.2 Proposed System

This proposed system aims to create a comprehensive, adaptive, and engaging learning environment for students seeking to master Python, html and php languages.This comprehensive system conducts assessments at three proficiency levels, offering personalized guidance through videos and notes. When a student faces difficulty, the system provides instant focus points for improvement, and individual progress is meticulously tracked. Students can undertake projects from a curated list, fostering the application of theoretical knowledge in real-world scenarios. Coding challenges and assessments, tailored to each programming language, deepen the understanding of coding proficiency. The real-time chat feature connects students with experienced tutors, facilitating on-the-spot clarification and guidance. A responsive chatbot further assists in addressing queries and provides real-time problem-solving support, creating a dynamic and supportive learning environment.The system implements a certification system and issues progress reports upon course completion, offering tangible recognition of achievement. Crucially, the system also encourages student feedback for continuous improvement.To ensure seamless communication, an integrated feature allows automated report sharing via email to teachers or parents, upholding data privacy and security standards.it provides a rich and interactive learning experience for students.

2.2 Problem definition

To know what the problem is and what the needs are before developing it. current education systems lack personalization, practical application, timely feedback, robust support, effective communication, and struggle to adapt to emerging technologies, posing challenges for an optimal learning experience.

2.3 Feasibility Study

The AI-Powered Virtual Tutor web app serves as an integrated platform for automating the process of knowledge analysis in an educational context. this app allows administrators to seamlessly view and update website related activities and users can login and update their profiles. It acts as a centralized system for efficient management and interaction, emphasizing ease of use and collaborative engagement within the educational environment.

2.3.1 Technical Feasibility

Technical feasibility assess whether the current technical resources are sufficient for the new system. By considering potential upgrades to the technology supporting our website, we aim to determine if the proposed system can seamlessly integrate into the existing infrastructure without necessitating additional hardware support. This assessment includes a careful review of processing power, storage capacity, and compatibility with AI frameworks. The goal is to ensure a smooth implementation that optimizes the current system's capabilities, potentially avoiding the need for significant hardware modifications.

2.3.2 Economical Feasibility

Economic feasibility determines whether the time and money are available to develop the system.it doesn't require additional hardware for development, minimizing upfront costs. The cost-effectiveness is highlighted, making the project financially viable for implementation. This aspect contributes to efficient resource utilization and aligns with economic considerations, ensuring that the development of the virtual tutor is both feasible and economically sustainable.

2.3.3 Operational Feasibility

Operational feasibility for the AI-powered virtual tutor is high, as it requires minimal additional training for users. The system's user-friendly interface ensures accessibility for anyone with internet knowledge and proficiency in English. With existing organizational resources readily available for implementation, the operational aspect is streamlined, facilitating smooth use and maintenance of the virtual tutor. The feasibility assessment suggests that the system is well-aligned with operational capabilities and requires minimal adaptation for successful deployment.

Chapter 3

3 Software Requirement Specification

3.1 Purpose

The purpose of this document is to give a detailed description of the requirements for the web app AI-powered Virtual Tutor. It illustrate the purpose and complete description for the development of the system. It explain system constraints, interface and interactions with other external applications. It primarily intended for students learning programming languages, it offers guidance to learners of varying speeds, accommodating both those who learn slowly and quickly. Notably, this document extends its focus to students unfamiliar with cs subjects, providing an inclusive resource for a diverse range of learners.

3.2 Scope

The scope for our AI-powered virtual tutor involves simplifying and enhancing students learning experiences with systematic tracking of progress through the website. Future expansion includes the potential incorporation of online payment features for added convenience and accessibility. Also the technologies like AR/VR and IoT, catering to diverse learners and fostering collaborative global education.

3.3 Overall Description

This section give an overview of our web app AI-powered virtual tutor.it is tailored for student-centric learning, providing a dynamic platform for assessing and enhancing knowledge. Students can register from anywhere, accessing personalized assessments and visual content. The system allowing students, admins to contribute unique functions. With separate logins, it ensures a participatory and enriched learning experience, focusing on personalized knowledge analysis and skill development.

3.3.1 Product Perspective

The AI-Powered Virtual Tutor web app serves as an integrated platform for automating the process of knowledge analysis in an educational context. this app allows administrators to seamlessly view and update website related activities and users can login and update their profiles. It acts as a centralized system for efficient management and interaction, emphasizing ease of use and collaborative engagement within the educational environment.

3.3.2 Product Functionality

Through this system admin can upload various data including assessments, learning materials, and system updates.students can login and participating in registrations for assessments and projects.

3.3.3 Users and Characteristics

There are two types of users that interact with the site student, admin and teachers. Each of these have different tasks which is performed. Admin can register users, upload content and manage website features. admin has comprehensive control over the system, responsible for administrative tasks. They can access to "Forget Password" for account recover. Teachers can support students by clearing doubts through the web app and engages in direct communication with students, providing guidance and clarification. Students can register, contact teachers for doubt clarification, and provide feedback for app improvement. They can actively participates in the learning process, seeking assistance, and contributing to system enhancement

3.4 Specific Requirements

3.4.1 Hardware Requirements

- System: IBM-Compatible PC

- Processor: Intel Core i3

- Speed: Above 1GHz

- RAM capacity: 4 GB

- Hard Dsk drive: 500 GB

- Keyboard: Standard

- Mouse:Standard

- Monitor:SVGA Color

3.4.2 Software Requirements

- Operating System:Windows or ubuntu

- Language used:Python,Django

- Database : MySql

- Technologies used:HTML,Javascript,CSS,Boot Strap(keros),jquery

3.5   Functional Requirements

It contains three main modules.

- 1.Admin

- 2.Teacher

- 3.User or Student

Admin

An Admin account is used for editing or managing the website dynamically by Admin panel. Admin can register users, upload content and verification of users are done by admin.Admin can update the website related activities.and they have all the logs related to the website.

Teacher

Teachers can support students by clearing doubts through the web app and engages in direct communication with students, providing guidance and clarification.

User or Student

The user or the students can fills a simple registration form in their respective email-id. After registration,users can login to the website. They can update their profiles, and attend accessment to know their knowledge. they can also access chatbot ,contact teachers for doubt clarification, and provide feedback for app improvement.User can download his perfomance certificate.

3.6   Non Functional Requirements

Non-functional requirements define the overall qualities or attributes of the resulting system. Non-functional system place restrictions on the product being developed, the developed process, and specify external constraints that the product must meet. Examples of non-functional requirements include safety, security, usability, reliability and performance requirements. Project management issues (costs, time and schedule) are often considered as non-functional requirements. The principal non - functional constraints which are relevant to critical systems :

- performance

- security

- safety

- usability

Performance

Performance requirements concern the speed of operation of a system. Types of performance requirements :

- Response requirements (how quickly the system reacts to a user input).

- Throughput requirements (how much the system can accomplish within a specified amount of time).

- Availability requirements (is the system available for service when requested by end users). The speed of operation of this system is adequate for the requirements.

Reliability

- Reliability is the ability of a system to perform its required function under stated conditions for a specified period of time.

- constraints on the runtime behavior of the system. This system is reliable because its functionalities can be done on the required conditions.

Safety

Safety requirements are not required which exclude unsafe situation from the possible solution of the system.

Usability

Usability is the ease with which a user can learn to operate, prepare inputs for, and interpret outputs of system or components. Usability requirements include :

- information error messages.

- well-formed user interfaces.

3.7 Interface Requirements

3.7.1 Hardware interfaces

The system must run over the internet, all the hardware shall require to connect internet will be hardware interface for the system. As for example modem,WAN-LAN.For a website hosting an AI-powered virtual tutor, the hardware interfaces primarily relate to the server infrastructure and any additional hardware components required to support the functionality of the website. Server Hardware: The website needs server hardware to host its application and data. Storage Devices: Storage devices are needed to store various data, including user profiles, content, AI models, and session logs. Networking Hardware:Networking hardware facilitates communication between the web server and clients (users' devices) and between different server components.

3.7.2 Software interfaces

For a website hosting an AI-powered virtual tutor, software interfaces are essential components that facilitate communication between different software modules, services, and components.Software interface required for the working of the project is the appropriate operating system. Web Server Interface: The website operates on a web server, such as Apache, Nginx, or Microsoft IIS. The web server handles incoming HTTP requests from clients (users' web browsers) and serves web pages and other resources. Database Interface: The virtual tutor requires a database to store and manage various types of data, including user profiles, learning materials, session logs, and AI model parameters

3.7.3 Communication interfaces

To create a website for an AI-powered virtual tutor, you would typically need several communication interfaces to facilitate interaction between the user and the AI tutor. These interfaces may include:

User Interface (UI): The UI is the visual interface through which users interact with the website. It includes elements such as menus, buttons, forms, and other graphical elements.

Chat Interface: A chat interface allows users to communicate with the AI tutor via text input. Users can ask questions, seek clarification, or engage in conversation with the virtual tutor.

Feedback Interface: An essential aspect of any AI-powered system is the ability to learn and improve over time. A feedback interface allows users to provide feedback on the accuracy and helpfulness of the virtual tutor's responses.

Data Input Interface: Depending on the functionality of the virtual tutor, users may need to input data such as their educational background, learning goals, or preferences.

Notification Interface: Notifications can be used to alert users about important updates, reminders, or new features related to the virtual tutor.

3.8   Security Requirements

- User accesses only their account.

- Validation of input is handled.

- This application containing the computer systems is physically secured against arms or surreptitious entry by intruders.

- Users must be authorized carefully to reduce changes of any such user giving access to an intruder in exchange for a bribe or other favour.

3.9   Platform Used

Windows 10 is a major version of the Microsoft Windows operating system that was released on July 29, 2015.It is built on the Windows NT kernel and follows windows 8.Part of the reason Microsoft decided to name the 2015 release "Windows 10"(and skipped "windows 9")is because the operating system is designed to be a new direction for Microsoft. One of the primary aims of windows 10 is to Unify the windows experience across multiple devices, such desktop computers, tablets, and smartphones. As part of this effort, Microsoft developed Windows10 Mobile alongside Windows 10 to replaces Windows Phone - Microsoft's previous mobile OS. Windows 10 also integrates other Microsoft services, such as Xbox Live and the Cortana voice recognition assistant.

3.10   Technologies Used

Html

HTML is the standard markup language for creating web pages and web applications.HTML is used to structure the content of a web page using a system of elements and tags. These elements represent various types of content such as text, images, links, forms, and multimedia. Each element is enclosed in angle brackets ¡¿ and typically consists of a start tag, content, and an end tag.

Javascript

JavaScript is a high-level programming language commonly used for creating dynamic and interactive websites. It is one of the core technologies of web

development, along with HTML (Hypertext Markup Language) and CSS (Cascading Style Sheets).

CSS

CSS, or Cascading Style Sheets, is a style sheet language used to describe the presentation of a document written in HTML or XML. CSS defines how HTML elements are displayed on screen, in print, or in other media types.

Bootstrap

Bootstrap is a popular front-end framework for building responsive and mobile-first websites. It provides a set of pre-designed HTML, CSS, and JavaScript components and utilities that developers can use to create consistent and visually appealing web interfaces quickly.

What distinguishes PHP from something like client - side Javascript is that the code is executed on the server, generating HTML which is then sent to the client. The client would receive the results of running that script, but would not know what the underlying code was. You can even configure your web server to process all your HTML files with PHP, and then there's really no way that users can tell what you have up your sleeve. The best things in using PHP are that it is extremely simple for a newcomer, but offers many advanced features for a professional programmer.

DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE (AUTONOMOUS)
IRINJALAKUDA

CERTIFICATE

This is to certify that the project report entitled *"IRON PURITY DE-TECTION"* is a bonafide record of the project work done by **Riswana P S** in partial fulfillment of the requirement for the sixth semester of **Bachelor of Computer Science** in Department of Computer Science of **CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

Ms. Viji vishwanathan
Assistant Professor,CS
Internal Guide

Ms. Sini Thomas
Head of the Department
Computer Science

EXTERNAL EXAMINER

INTERNAL EXAMINER

DECLARATION

I hereby declare that this project work **"IRON PURITY DETECTION"** submitted to Christ College (Autonomous) Irinjalakuda, affiliated to Calicut University in partial fulfillment of the requirement for the award of the Bachelor of Computer Science, is a record of original work done by us, under the guidance of Ms. VIJI VISWANATHAN, Department of computer Science.

Place: Irinjalakuda   RISWANA P S

ACKNOWLEDGEMENT

ABSTRACT

The project focuses on **IRON PURITY DECTECTION** using machine learning, employing a dataset collected from the site Kaggle. Implemented as a web application, the system utilizes novel detection techniques to classify iron as either pure or impure. This will provide successful application of machine learning for accurate iron purity assessment in an interactive web-based environment.

Contents

Chapter 1

1   Introduction

In industries and manufacturing processes, ensuring the quality and purity of materials is crucial for maintaining product integrity. The "Iron Purity Detection" project addresses the need for a reliable and efficient system to assess the purity of iron samples using advanced regression techniques. This project employs two powerful regression methods: Linear Regression and Stochastic Gradient Descent (SGD) Regression. By leveraging these techniques, we aim to create a robust model capable of predicting the purity of iron samples based on relevant features and attributes.

This dataset is about a flotation plant which is a process used to concentrate the iron ore. This process is very common in a mining plant. The target is to predict the (which is the one hour for the process engineers to have this value. So if it is posible to predict the amount of impurity in the process

Through this project, we not only seek to develop an accurate predictive model but also to contribute to the advancement of quality control processes in industries dealing with iron production. The integration of linear regression and SGD regression offers a comprehensive solution for real-time monitoring and assessment of iron purity, thereby improving overall product quality and reducing operational risks. .

1.1   Overview

The "Iron Purity Detection" project addresses the critical need for accurate and efficient assessment of iron purity in industries involved in iron production, particularly in processes like flotation plants used to concentrate iron ore. The aim is to predict the percentage of silica, an impurity, in the final iron ore concentrate. Given that lab measurements of silica content take considerable time to obtain, the project focuses on developing a predictive model to estimate silica content in real-time during the production process.

To achieve this, the project utilizes advanced regression techniques, specifically Linear Regression and Stochastic Gradient Descent (SGD) Regression. These methods are chosen for their ability to analyze relevant features and attributes of the iron ore samples and make accurate predictions of silica content. By leveraging these techniques, the project aims to create a robust model capable of providing real-time estimates of silica impurity levels, thereby enabling proactive quality control measures in iron production processes.

The integration of Linear Regression and SGD Regression offers a comprehensive solution for monitoring and assessing iron purity, contributing to improved product quality and reduced operational risks in industries dealing with iron production. By providing timely and accurate predictions of silica content, the project not only enhances quality control processes but also drives

efficiency and optimization in iron production operations. Overall, the project's outcomes have the potential to significantly impact the iron production industry by enabling better decision-making and ensuring the integrity of final products.

Chapter 2

2 System Analysis

2.1 Purpose

The purpose of the "Iron Purity Detection" project is to develop a reliable and efficient system for assessing the purity of iron samples in industries involved in iron production. By predicting the percentage of silica, an impurity, in the end product using advanced regression techniques such as Linear Regression and Stochastic Gradient Descent (SGD) Regression, the project aims to provide a tool for real-time monitoring and quality control during the manufacturing process. This contributes to improving product integrity, enhancing quality control processes, and reducing operational risks in industries dealing with iron production.

2.1.1 Existing System

Machine Learning models are created to predict purity of iron. The introductory study includes reviewing the rows, summarizing the columns, basic statistics, data types, and handling missing values. Data preparation and cleaning involve addressing missing values and potential transformations. Exploratory data analysis (EDA) section looks at the independent variables and how it affects the percentage of silica concentrate. Scaling is done using MinMaxScaler and split the data into train and test set using train test split . Model Training:Two regression algorithms are used: Linear Regressor and SGD Regressor algorithms . Trained the model using test data set and predicted the output. Model Evaluation : Calculated the Mean squared error, mean absolute error, and Root mean squared error. Model Prediction : Predicted the percentage of silica by giving new input values. Trained models are saved using pickle..

2.1.2 Proposed System

Iron Purity Detection is done using machine learning algorithms. Here are the key points Data preparation : Data loading and preprocessing using EDA tools like Pandas , Numpy, seaborn, and matplotlib. Algorithms used: 1)Linear Regression : It is a fundamental algorithm in machine learning , commonly usefd for predicting a continuous target variable based on one or more input features. It assumes a linear relationship between the input features and the target variable. The algorithm aims to find the best fit-line that minimizes the difference between the predicted and actual values. The basic steps include defining a linear equation (y = mx + b), determining the coefficients (m and b) through optimization methods like least squares, and using the trained model for predictions. The architecture is straightforward, making it a fundamental tool in regression analysis. 2) SGD Regression : Stochastic Gradient Descent (SGD) Regression is a variant of linear regression that utilizes the stochastic gradient

descent optimization algorithm for training. It updates the model parameters based on a randomly selected subset of the training data (mini-batch) rather than the entire dataset. This stochastic updating helps improve efficiency and scalability. The algorithm seeks to minimize a cost function, often the Mean Squared Error, by iteratively adjusting model coefficients with a learning rate. The stochastic nature of the updates introduces variability, enabling rapid adaptation to changing data patterns. By the careful tuning of hyperparameters, such as learning rate and batch size, is crucial to balance computational efficiency and stable convergence. SGD Regression finds applications in scenarios where processing the entire dataset at once is impractical, making it a valuable tool for large-scale regression problems.

2.2 Problem definition

To know what the problem is and what the needs are before developing it. Here we design a website of Zephyrus for conducting a Techfest in an institution

2.3 FEASIBILITY STUDY

After the problem is clearly understood and solutions proposed, the next step is to conduct the feasibility study. Feasibility study is defined as evaluation or analysis of the potential impact of the proposed project or program. The objective is to determine whether the proposed system is feasible. There are three aspects of feasibility study to which the proposed system is subjected as discussed below.

2.3.1 Technical Feasibility

Technical feasibility assess whether the current technical resources are sufficient for the new system. We can upgrade the level of technology for supporting our website. We check whether the proposed system can be implemented in the present system without supporting the existing hardware.

2.3.2 Economical Feasibility

Economic feasibility determines whether the time and money are available to develop the system. There is no additional hardware used to develop the site, it is inexpensive to build.

2.3.3 Operational Feasibility

Operational feasibility determines if the human resources are available to operate the system once it has been installed. No extra training is needed to use this system. Anyone who has knowledge in internet in english language can easily use the system. The resources that are required to implement or install are already available with the organization.

Chapter 3

3 Software Requirement Specification

3.1 Purpose

The purpose of project on iron purity detection using machine learning is likely to ensure the quality control of iron materials. By employing novel detection techniques, the web application can assess whether the iron is pure or impure based on the dataset collected from a specific site. This quality assessment can have significant implications for industries relying on iron, ensuring the use of high-quality materials in various applications, such as manufacturing or construction.

3.2 Scope

The scope of your iron purity detection project extends to industries and applications that heavily depend on iron. This includes manufacturing, construction, and any field where the quality of iron materials is crucial. The project's scope also involves contributing to quality control processes, potentially leading to cost savings, improved efficiency, and enhanced product reliability for industries utilizing iron. Additionally, the web application's accessibility makes it convenient for users to quickly and accurately determine the purity of iron materials, further expanding its potential impact.

3.3 Overall Description

The IRON PURITY DETECTOR project is designed for finding an iron is good quality or bad quality.This system enables the user to register on home page and then get sign in to the purity detection test part and by uploading the specific feed that already get through the lab process and later it find that iron is good or bad in quality.

3.3.1 Product Perspective

IRON PURITY DETECTOR is mainly used for the testing of iron within few second and which done through lab process that take hours to find and we implement this in a technical manner.The user and admin can upload the data find the result.

3.3.2 Product Functionality

Here the admin add and update the feeds.User can add the value to the feed and get the appropriate results with a value that specify how impurities are there.

STUDENT RESULT ANALYSIS SYSTEM

PROJECT REPORT

Submitted By

SAVIO DAVIS

Reg.No. CCAVSCS034

for the award of the Degree of

Bachelor of Science (B.Sc.)

in Computer Science
(University of Calicut)

under the guidance of

Mr.Thoufeeq Ansari

Assistant Professor

BSc. COMPUTER SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE(Autonomous)
IRINJALAKUDA, KERALA
INDIA

March 2024

DEPARTMENT OF COMPUTER SCIENCE
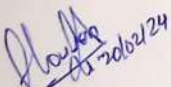
CHRIST COLLEGE (AUTONOMOUS)

IRINJALAKUDA

CERTIFICATE

This is to certify that the project report entitled *"Student result analysis system "*record of the project work done by **Savio Davis** *in partial fulfillment of the requirement for the sixth semester of* **Bachelor of Computer Science** *in Department of Computer Science of* **CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

Mr.Thoufeeq Ansari
Assistant Professor,CS
Internal Guide

Ms. Sini Thomas
Head of the Department
Computer Science

EXTERNAL EXAMINER

INTERNAL EXAMINER

DECLARATION

I hereby declare that this project work **"STUDENT RESULT ANAL-YSIS SYSTEM"** submitted to Christ College (Autonomous) Irinjalakuda, affiliated to Calicut University in partial fulfillment of the requirement for the award of the Bachelor of Computer Science, is a record of original work done by us, under the guidance of Ms.THOUFEEQ ANSARI, Department of computer Science.

Place: Irinjalakuda   SAVIO DAVIS

ACKNOWLEDGEMENT

ABSTRACT

STUDENT RESULT ANALYSIS SYSTEM is a web site design. This application used for the analyzing the student results according to the user requirements and generate the performance report of student, subject or branch. It also allows the student to see their individual performance in semester. this will help the college management to take the appropriate actions to improve the quality of education and helps in improving the performance of students. Resource-related results analysis is one variation of results analysis

Contents

Chapter 1

1 Introduction

Student Result Analysis System is a web site design. This website used for the analysing the students results according to the user requirements. It also allows the student to see their individual performance in semester. this will help the college management to take the appropriate actions to improve the quality of education and helps in improving the performance of students. In this Result Analysis System there are four login. Admin login ,Staff login, HOD login and Student login. Admin login can add HOD, Staff, Student, Course, Subject, Session and also manage them all. Staff login can add result, edit result, view result and compare the results. HOD login can compare results between classes. Student login can view result and compare results. This system has been designed to carry out the mark analysis process in an educational institution. Now a day result analysis and comparison is done manually by taking lots of effort and time. This system is a solution for such problems.

1.1 Overview

Student Result Analysis System is a web site which designed by using python and django. This website used for the analysing the student results according to the user requirements and generate the statistical graph.

Chapter 2

2 System Analysis

2.1 Purpose

The student results analysis system project aims to create a user-friendly system for educational institutions to manage and analyse student performance. In this Result Analysis System there are four login. Admin login ,Staff login, HOD login and Student login. Admin login can add HOD, Staff, Student, Course, Subject, Session and also manage them all. Staff login can add result, edit result, view result and compare the results. HOD login can compare results between classes. Student login can view result and compare results. It store and manage students information, including personal details and academic records. Analysing student performance across various subjects, semesters, or academic periods. Allowing students, teachers, and administrators to track students and batch progress over time. Generating statistical reports and charts to visualize trends and patterns in student performance. Presenting data in a visually appealing and easy-to-understand format, such as graphs, charts, and tables.

2.1.1 Existing System

An existing system for student result analysis typically involves software or a platform designed to efficiently manage and analyze students academic performance.

2.1.2 Proposed System

Student Result Analysis System is an student driven system that is designed in order to keep record of student data by use of technology. Now-a-day result analysis is done manually taking lots of effort and time then too desired accuracy is not achieved. Also updation of data is very difficult as all data needs to revised again. In addition more paperwork and documentation is required.

2.2 Problem definition

Inefficiency in Result Management: Manual processes for entering and managing student results lead to inefficiencies, errors, and delays in updating academic records.

Limited Data Analysis Capabilities: Existing systems may lack robust tools for analyzing student performance data, hindering educators' ability to identify trends, patterns, and areas for improvement.

Lack of Insightful Reporting: Current reporting mechanisms may provide basic information but fail to deliver actionable insights that can guide decision-making and instructional planning.

Communication Gaps: Inadequate communication channels between teachers, students, and parents/guardians may hinder timely feedback on academic progress and performance.

Data Security and Privacy Concerns: With increasing reliance on digital platforms, ensuring the security and privacy of student data becomes paramount to comply with regulations and safeguard sensitive information.

Scalability Issues: Existing systems may struggle to scale effectively to accommodate growing student populations or evolving educational requirements.

2.3 Feasibility study

After the problem is clearly understood and solutions proposed, the next step is to conduct the feasibility study. Feasibility study is defined as evaluation or analysis of the potential impact of the proposed project or program. The objective is to determine whether the proposed system is feasible. There are three aspects of feasibility study to which the proposed system is subjected as discussed below.

2.3.1 Technical Feasibility

Technical feasibility assess whether the current technical resources are sufficient for the new system. We can upgrade the level of technology for supporting our website. We check whether the proposed system can be implemented in the present system without supporting the existing hardware.

2.3.2 Economical Feasibility

Economic feasibility determines whether the time and money are available to develop the system. There is no additional hardware used to develop the site, it is inexpensive to build.

2.3.3 Operational Feasibility

Operational feasibility determines if the human resources are available to operate the system once it has been installed. No extra training is needed to use this system. Anyone who has knowledge in internet in english language can easily use the system. The resources that are required to implement or install are already available with the organization.

Chapter 3

3 Software Requirement Specification

3.1 Purpose

The main purpose of the project is to streamline the process of gathering, organizing, and presenting student academic data. It aims to offer insights into individual and group performance, identify areas of improvement, and enable effective academic planning.

3.2 Scope

User authentication: Secure login and access control for administrators, teachers, and students. Result management: Uploading, storing, and organizing student results in a database. Dashboard: Displaying visualizations and summaries of student performance and class-wise statistics. Individual student analysis: Providing detailed performance reports for each student Class analysis: Comparative analysis of class-wise performance and subject-wise trends.

3.3 Overall Description

Student result analysis is a web site developed for colleges to analyze the results of student. For students it is easy to check the result, it will simply enter their email id and password. It store and manage students information, including personal details and academic records. Analysing student performance across various semesters, or academic periods. Allowing students, teachers, and administrators to track students and batch progress over time.

3.3.1 Product Perspective

The product perspective of a student result analyzer project involves considering its functionality, usability, and integration with existing systems.

3.3.2 Product Functionality

The student result analyzer should be able to efficiently process and analyze student results from various subjects and semesters. It should calculate marks and display statistic graphs.

3.3.3 Users and Characteristics

There are four types of users that interact with the site admin, Staffs,HOD and Students. Each of these have different tasks which is performed. Admin login can add HOD, Staff, Student, Course, Subject, Session and also manage them all. Staff login can add result, edit result, view result and compare the results.

C-JOBS

PROJECT REPORT

Submitted By

SESLIN SEBASTIAN

Reg. No. CCAVSCS035

for the award of the Degree of

Bachelor of Science (B.Sc.)

in Computer Science
(University of Calicut)

under the guidance of

Mr.Linto George

Assistant Professor

BSc. COMPUTER SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE(Autonomous)
IRINJALAKUDA, KERALA
INDIA

March 2024

DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE (AUTONOMOUS)
IRINJALAKUDA

CERTIFICATE

This is to certify that the project report entitled "C-JOBS" is a bonfied record of the project work done by *Seslin Sebastian* in partial fulfillment of the requirement for the sixth semester of *Bachelor of Computer Science* in Department of Computer Science of CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA

Mr.Linto George
Assistant Professor,CS
Internal Guide

Ms. Sini Thomas
Head of the Department
Computer Science

Broitha V
26|8|24

EXTERNAL EXAMINER

INTERNAL EXAMINER

DECLARATION

I hereby declare that this project work "**C-JOBS**" submitted to Christ College (Autonomous) Irinjalakuda, affiliated to Calicut University in partial fulfillment of the requirement for the award of the Bachelor of Computer Science, is a record of original work done by me under the guidance of Mr.LINTO GEORGE, Department of computer Science.

Place: Irinjalakuda   SESLIN SEBASTIAN

ACKNOWLEDGEMENT

First and foremost I like to thank Lord almighty for his providence and for being the guiding light throughout the project. I wish to express my sincere gratitude to our beloved Department head for giving me all the facilities for our project. I take this opportunity to express my gratitude to the class teacher Ms. RASMI P.M and head of the department Ms. SINI THOMAS who has been supported me throughout the course of this project. I thankful for her aspiring guidance and valuable advice during the project work.I express my sincere thanks to my project guide Mr.THOUFEEQ ANSARI for supporting and guiding throughout the project.I would take this opportunity to specially thank all other faculty members for their constant and continuous motivation. Finally I would like to thank my family and friends for giving valuable advice and moral support throughout my project.

ABSTRACT

C-JOBS is a innovative website introduced to manage and automates the placement procedures at Christ College(Autonomous) Irinjalakuda. The website is enriched with three kind of login facilities - admin login, student login, faculty login.,The portal allows students to explore job vacancies, apply for jobs, view training programs, and access various study materials. Faculty members, designated as administrators, have the authority to manage students, faculty, courses, departments, jobs, placed students, and training programs. All these features make this website more adaptable and user-friendly.

Contents

Chapter 1

1 Introduction

The C-JOBS project is a software application designed to streamline and automate the process of managing placements for students in educational institutions. C-JOBS is designed to help students for applying jobs. It will help to apply for the job were they fit in . This project helps the training and placement officers to overcome the difficulty in keeping records of hundreds and thousands of students and searching the eligible students for recruitment, based on various eligibility criteria of different companies .This enables you to plan placements, train students in accordance with relevant market demands, organize placement drives, and allow companies to recruit students.

1.1 Overview

The main objective of the C-JOBS is to manage the details of the Student and Placement Cell, to reduce manual work and time. This project is a Python Django-based web application for managing a college job portal. The portal allows students to explore job vacancies, apply for jobs, view training programs, and access various study materials. Faculty members, designated as administrators, have the authority to manage students, faculty, courses, departments, jobs, placed students, and training programs.

Chapter 2

2 System Analysis

2.1 Purpose

The main purpose of this website is to create a website of Placement Management System which is owned by Placement cell. The benefit of this website is very high because the college can use this website for a well maintained Placement Management System.

2.1.1 Existing System

The traits of the earlier working model and their drawback are described in the existing system. The existing system does all processes manually. Placement officers record the data of students. If any alterations or updates are necessary in the profile of any student, it has to be done manually. This is tedious and time-consuming, lacks the security of data, took more manpower, consumes a large volume of paper and space. When the number of users increases, then this method is very problematic. In the previous system placement officer has to collect student details for placements. Approving those student details takes a lot of time.Implementing a digital placement managment system can automate and streamline these processes,making them more efficient,transparent,and accessible to all stakeholders involved

2.1.2 Proposed System

The proposed system can overcome all the limitations of the existing system, such as student's information is maintained in the database, it gives more security to data, ensures data accuracy, reduces paper work and save time, it makes information flow efficient and paves way for easy report generation, reduce the space, proposed system is cost effective. Placed student details , reviews and other statistic information will be displayed. Filtering student profiles based on companies requirements. It is easy for students to get information of newer placement programs.Students can explore job vacancies, view detailed listings, apply online, and upload their resumes and they can view and access available training programs to enhance their skills. The portal provides access to various study materials to support student learning.

2.2 Problem definition

To know what the problem is and what the needs are before developing it. Here we design a website of C-JOBS for maintaining Placement Procedure.Students choose a specific college where the placement will be held,there is a need to maintain all these papers,causing large amount of space.It is manually done,chances of missing,difficult to handle the details of student.

2.3 Feasibility Study

After the problem is clearly understood and solutions proposed, the next step is to conduct the feasibility study. Feasibility study is defined as evaluation or analysis of the potential impact of the proposed project or program. The objective is to determine whether the proposed system is feasible. A feasibility study for a placement managment system project might include schedule feasibility and economical feasibility.The schedule feasibility might include ,How likely the project is to be completed within its proposed time frame and the economical feasibility, A check for the high investment incrurred for the system.There are three aspects of feasibility study to which the proposed system is subjected as discussed below.

2.3.1 Technical Feasibility

Technical feasibility assess whether the current technical resources are sufficient for the new system. We can upgrade the level of technology for supporting our website. We check whether the proposed system can be implemented in the present system without supporting the existing hardware.

2.3.2 Economical Feasibility

Economic feasibility determines whether the time and money are available to develop the system. There is no additional hardware used to develop the site, it is inexpensive to build.

2.3.3 Operational Feasibility

Operational feasibility determines if the human resources are available to operate the system once it has been installed. No extra training is needed to use this system. Anyone who has knowledge in internet in English language can easily use the system. The resources that are required to implement or install are already available with the organization.

Chapter 3

3 Software Requirement Specification

3.1 Purpose

The purpose of this document is to give a detailed description of the requirements for the website of C-JOBS. It illustrates the purpose and complete description for the development of the system. It explains system constraints, interface and interactions with other external applications. This document is primarily intended to be proposed to a college for maintaining placement cell.The C-JOBS is a software solution that helps colleges and companies manage their hiring and recruitment processes.

3.2 Scope

The project has a wide scope. Our project mainly helps in improving productivity and makes use of utilization of resources. There is no duplication of work as this was not the case when done manually. Thus it reduces labor and increases morale. The system intends userfriendly operations which may resolve ambiguity. The project is a total management and informative system, which provides the up- to-date information of all the students in the college. Our system also help the college to overcome the difficulty in keeping records of hundreds of students and searching for a student eligible for recruitment criteria from the whole thing. It helps in effective and timely utilization of resources. The project facilitates userfriendly, reliable and fast management system. The placement officer itself can carry out operations in a smooth and effective manner. They need not concentrate on record keeping. The college can maintain computerized records thus reducing paper work, time and money . We can get all information about the placement cell by having a look at this website.

3.3 Overall Description

This section give an overview of our website, C-JOBS.The main objective of the placement management system is to reduce manual work and time. It is difficult and time-consuming to collect all the details from each student. To avoid this problem we have planned to develop a web-based placement management system. This project is designed for managing placement cell. The portal allows students to explore job vacancies, apply for jobs, view training programs, and access various study materials. Faculty members, designated as administrators, have the authority to manage students, faculty, courses, departments, jobs, placed students, and training programs. Student, admin and teachers are also getting equal participation in uploading unique functions in it and also separate login is also provided.

AI-POWERED VIRTUAL TUTOR

PROJECT REPORT

Submitted By

SIMON B CHETTUPUZHA

Reg. No. CCAVSCS036

for the award of the Degree of

Bachelor of Science (B.Sc.)

in Computer Science
(University of Calicut)

under the guidance of

Mr.Joju Sebastian

Assistant Professor

**BSc. COMPUTER SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE(Autonomous)
IRINJALAKUDA, KERALA
INDIA**

March 2024

DEPARTMENT OF COMPUTER SCIENCE

CHRIST COLLEGE (AUTONOMOUS)

IRINJALAKUDA

CERTIFICATE

This is to certify that the project report entitled *"Ai-Powered Virtual Tutor"* is a bonafide record of the project work done by **Simon B Chettupuzha** in partial fulfillment of the requirement for the sixth semester of **Bachelor of Computer Science** in Department of Computer Science of *CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA*

Mr.Joju Sebastian
Assistant Professor,CS
Internal Guide

Ms. Sini Thomas
Head of the Department
Computer Science

EXTERNAL EXAMINER

INTERNAL EXAMINER

DECLARATION

I hereby declare that this project work "**AI-POWERED VIRTUAL TUTOR**" submitted to Christ College (Autonomous) Irinjalakuda, affiliated to Calicut University in partial fulfillment of the requirement for the award of the Bachelor of Computer Science, is a record of original work done by me, under the guidance of Mr.JOJU SEBASTIAN, Department of Computer Science.

Place: Irinjalakuda   SIMON B CHETTUPUZHA

ACKNOWLEDGEMENT

First and foremost I like to thank Lord almighty for his providence and for being the guiding light throughout the project. I wish to express my sincere gratitude to our beloved Department head for giving me all the facilities for our project. I take this opportunity to express my gratitude to the class teacher Ms. RASMI P M and head of the department Ms. SINI THOMAS who has been supported me throughout the course of this project. I am thankful for her aspiring guidance and valuable advice during the project work. I express my sincere thanks to my project guide Mr. JOJU SEBASTIAN for supporting and guiding throughout the project.I would take this opportunity to specially thank all other faculty members for their constant and continuous motivation. Finally I would like to thank my family and friends for giving valuable advice and moral support throughout our project.

ABSTRACT

AI-Powered Virtual Tutor is an web application designed to revolutionize learning experiences. The application is enriched with two kind of login facilities - admin login, user login. It conducts assessments through seamless integration with various subjects, students can access a comprehensive platform that fosters knowledge acquisition and skill development. The main features are - users can benefit from tailored lessons, real-time feedback and it allows them to track their progress. admin can register users, upload content, update website related activities and so on. All these features make this website more adaptable and user-friendly.

Contents

Chapter 1

1   Introduction

Welcome to our project on AI-powered Virtual Tutor, where learning meets innovation! Experience a transformative approach to education as we analyze your knowledge through interactive tests. In the contemporary realm of education, the integration of artificial intelligence has heralded a paradigm shift in pedagogical approaches, ushering in an era where traditional teaching methods are augmented by the capabilities of cutting-edge technology. A pinnacle manifestation of this transformation is witnessed in the emergence of AI-powered virtual tutors, sophisticated educational tools that go beyond conventional boundaries. This not only assess student's knowledge but also to provide nuanced and tailored guidance. The fundamental premise of these AI-powered virtual tutors revolves around their ability to conduct comprehensive assessments of student's understanding and proficiency across various subjects. By employing intricate algorithms, these digital tutors can analyze vast datasets, discern patterns, and evaluate a student's grasp of diverse concepts. This analytical prowess allows for a nuanced understanding of individual learning trajectories, going beyond standardized assessments to provide a more holistic view of a student's academic strengths and areas that warrant further attention. However, the true innovation lies in the personalized guidance these virtual tutors offer based on the insights gleaned from assessments. Tailored to each student's unique learning profile, these AI-powered mentors can pinpoint specific areas of improvement, recommend targeted resources, and even adapt the learning pace to accommodate individual needs. This level of personalization transcends the limitations of one-size-fits-all approaches, fostering an environment that nurtures each student's intellectual growth. As we delve deeper into the intricate capabilities of AI-powered virtual tutors, it becomes apparent that they serve as more than mere evaluators. They evolve into dynamic guides, steering students through their academic journeys with precision and adaptability. This aims to unravel the layers of this transformative technology, exploring its impact on student assessment and the provision of personalized guidance, ultimately shedding light on the profound implications it holds for the future of education.

1.1   Overview

The main aim of our AI-powered Virtual Tutor project is to revolutionize the education landscape by providing a personalized and adaptive learning experience for students. The cornerstone of our ambitious endeavor lies in the profound transformation of the educational landscape through the deployment of our AI-powered Virtual Tutor. At its core, this visionary project seeks to revolutionize traditional teaching methodologies by providing a learning experience that is not only personalized but also adaptive to the unique needs and learning styles

of individual students. The overarching objective is to propel students towards a deeper understanding and mastery of various subjects, with a specialized emphasis on programming languages like Python, HTML, and PHP. With an unwavering commitment to enhancing educational outcomes, our Virtual Tutor endeavors to usher in a new era where learning is not a one-size-fits-all endeavor but rather a dynamic and tailored experience. The focal point of our efforts is to address the intricacies of programming education, acknowledging that each student possesses distinctive strengths and areas requiring improvement. By tailoring content and guidance to these individual needs, our Virtual Tutor aims to bridge educational gaps and cultivate a holistic understanding of complex subjects. Central to the efficacy of our AI-powered Virtual Tutor is its proficiency in offering personalized guidance and real-time feedback. Gone are the days of passive learning, as our system actively engages with students, adapting its approach based on real-time assessments. This responsiveness ensures that students receive immediate insights into their progress, allowing for a continuous cycle of improvement. Through this interactive feedback loop, the Virtual Tutor becomes not just an instructor but a mentor, guiding students towards programming excellence. Imagine a world where mastering programming languages is not only a pedagogical exercise but an intuitive, engaging journey uniquely tailored to your skills. Our Virtual Tutor provides this transformative experience, transcending the conventional boundaries of education. It invites students to embrace a smarter way of learning, where the intricacies of programming are demystified, and the path to excellence becomes navigable through personalized guidance. In the pages that follow, we will delve into the intricate details of this revolutionary project, exploring how it redefines education and serves as the key to unlocking the door to programming mastery.

Chapter 2

2 System Analysis

2.1 Purpose

The purpose of our AI-powered Virtual Tutor is twofold: to accommodate the diverse learning speeds of students and to provide comprehensive support for both fast and slower learners, particularly in the context of programming education. This practical application of knowledge encourages a deeper understanding of programming concepts and enhances real-world problem-solving skills. The Virtual Tutor adapts to their quick comprehension, preventing boredom or stagnation often experienced in traditional, one-size-fits-all learning environments. The ultimate goal is to empower every student to succeed and thrive in their programming journey.

2.1.1 Existing System

The existing system of AI-powered systems can analyze a student's strengths ,learning styles and creating tailored learning experiences through conducting tests. it provides instantaneous feedback to students and guiding them.it adapt to different learning styles , It also provides chatbot for instant assistance to students, answer common questions. These tools suggest additional learning resources, such as videos, or exercises based on a student's progress and interests.

2.1.2 Proposed System

This proposed system aims to create a comprehensive, adaptive, and engaging learning environment for students seeking to master Python, html and php languages.This comprehensive system conducts assessments at three proficiency levels, offering personalized guidance through videos and notes. When a student faces difficulty, the system provides instant focus points for improvement, and individual progress is meticulously tracked. Students can undertake projects from a curated list, fostering the application of theoretical knowledge in real-world scenarios. Coding challenges and assessments, tailored to each programming language, deepen the understanding of coding proficiency. The real-time chat feature connects students with experienced tutors, facilitating on-the-spot clarification and guidance. A responsive chatbot further assists in addressing queries and provides real-time problem-solving support, creating a dynamic and supportive learning environment.The system implements a certification system and issues progress reports upon course completion, offering tangible recognition of achievement. Crucially, the system also encourages student feedback for continuous improvement.To ensure seamless communication, an integrated feature allows automated report sharing via email to teachers or parents, upholding data privacy and security standards.it provides a rich and interactive learning experience for students.

2.2   Problem definition

To know what the problem is and what the needs are before developing it. current education systems lack personalization, practical application, timely feedback, robust support, effective communication, and struggle to adapt to emerging technologies, posing challenges for an optimal learning experience.

2.3   Feasibility Study

The AI-Powered Virtual Tutor web app serves as an integrated platform for automating the process of knowledge analysis in an educational context. this app allows administrators to seamlessly view and update website related activities and users can login and update their profiles. It acts as a centralized system for efficient management and interaction, emphasizing ease of use and collaborative engagement within the educational environment.

2.3.1   Technical Feasibility

Technical feasibility assess whether the current technical resources are sufficient for the new system. By considering potential upgrades to the technology supporting our website, we aim to determine if the proposed system can seamlessly integrate into the existing infrastructure without necessitating additional hardware support. This assessment includes a careful review of processing power, storage capacity, and compatibility with AI frameworks. The goal is to ensure a smooth implementation that optimizes the current system's capabilities, potentially avoiding the need for significant hardware modifications.

2.3.2   Economical Feasibility

Economic feasibility determines whether the time and money are available to develop the system.it doesn't require additional hardware for development, minimizing upfront costs. The cost-effectiveness is highlighted, making the project financially viable for implementation. This aspect contributes to efficient resource utilization and aligns with economic considerations, ensuring that the development of the virtual tutor is both feasible and economically sustainable.

2.3.3   Operational Feasibility

Operational feasibility for the AI-powered virtual tutor is high, as it requires minimal additional training for users. The system's user-friendly interface ensures accessibility for anyone with internet knowledge and proficiency in English. With existing organizational resources readily available for implementation, the operational aspect is streamlined, facilitating smooth use and maintenance of the virtual tutor. The feasibility assessment suggests that the system is well-aligned with operational capabilities and requires minimal adaptation for successful deployment.

Chapter 3

3 Software Requirement Specification

3.1 Purpose

The purpose of this document is to give a detailed description of the requirements for the web app AI-powered Virtual Tutor. It illustrate the purpose and complete description for the development of the system. It explain system constraints, interface and interactions with other external applications. It primarily intended for students learning programming languages, it offers guidance to learners of varying speeds, accommodating both those who learn slowly and quickly. Notably, this document extends its focus to students unfamiliar with cs subjects, providing an inclusive resource for a diverse range of learners.

3.2 Scope

The scope for our AI-powered virtual tutor involves simplifying and enhancing students learning experiences with systematic tracking of progress through the website. Future expansion includes the potential incorporation of online payment features for added convenience and accessibility. Also the technologies like AR/VR and IoT, catering to diverse learners and fostering collaborative global education.

3.3 Overall Description

This section give an overview of our web app AI-powered virtual tutor.it is tailored for student-centric learning, providing a dynamic platform for assessing and enhancing knowledge. Students can register from anywhere, accessing personalized assessments and visual content. The system allowing students, admins to contribute unique functions. With separate logins, it ensures a participatory and enriched learning experience, focusing on personalized knowledge analysis and skill development.

3.3.1 Product Perspective

The AI-Powered Virtual Tutor web app serves as an integrated platform for automating the process of knowledge analysis in an educational context. this app allows administrators to seamlessly view and update website related activities and users can login and update their profiles. It acts as a centralized system for efficient management and interaction, emphasizing ease of use and collaborative engagement within the educational environment.

3.3.2 Product Functionality

Through this system admin can upload various data including assessments, learning materials, and system updates.students can login and participating in registrations for assessments and projects.

3.3.3 Users and Characteristics

There are two types of users that interact with the site student, admin and teachers. Each of these have different tasks which is performed. Admin can register users, upload content and manage website features. admin has comprehensive control over the system, responsible for administrative tasks. They can access to "Forget Password" for account recover. Teachers can support students by clearing doubts through the web app and engages in direct communication with students, providing guidance and clarification. Students can register, contact teachers for doubt clarification, and provide feedback for app improvement. They can actively participates in the learning process, seeking assistance, and contributing to system enhancement

3.4 Specific Requirements

3.4.1 Hardware Requirements

- System: IBM-Compatible PC
- Processor: Intel Core i3
- Speed: Above 1GHz
- RAM capacity: 4 GB
- Hard Dsk drive: 500 GB
- Keyboard: Standard
- Mouse:Standard
- Monitor:SVGA Color

3.4.2 Software Requirements

- Operating System:Windows or ubuntu
- Language used:Python,Django
- Database : MySql
- Technologies used:HTML,Javascript,CSS,Boot Strap(keros),jquery

3.5 Functional Requirements

It contains three main modules.

- 1.Admin

- 2.Teacher

- 3.User or Student

Admin

An Admin account is used for editing or managing the website dynamically by Admin panel. Admin can register users, upload content and verification of users are done by admin.Admin can update the website related activities.and they have all the logs related to the website.

Teacher

Teachers can support students by clearing doubts through the web app and engages in direct communication with students, providing guidance and clarification.

User or Student

The user or the students can fills a simple registration form in their respective email-id. After registration,users can login to the website. They can update their profiles, and attend accessment to know their knowledge. they can also access chatbot ,contact teachers for doubt clarification, and provide feedback for app improvement.User can download his perfomance certificate.

3.6 Non Functional Requirements

Non-functional requirements define the overall qualities or attributes of the resulting system. Non-functional system place restrictions on the product being developed, the developed process, and specify external constraints that the product must meet. Examples of non-functional requirements include safety, security, usability, reliability and performance requirements. Project management issues (costs, time and schedule) are often considered as non-functional requirements. The principal non - functional constraints which are relevant to critical systems :

- performance

- security

- safety

- usability

Performance

Performance requirements concern the speed of operation of a system. Types of performance requirements :

- Response requirements (how quickly the system reacts to a user input).

- Throughput requirements (how much the system can accomplish within a specified amount of time).

- Availability requirements ·(is the system available for service when requested by end users). The speed of operation of this system is adequate for the requirements.

Reliability

- Reliability is the ability of a system to perform its required function under stated conditions for a specified period of time.

- constraints on the runtime behavior of the system. This system is reliable because its functionalities can be done on the required conditions.

Safety

Safety requirements are not required which exclude unsafe situation from the possible solution of the system.

Usability

Usability is the ease with which a user can learn to operate, prepare inputs for, and interpret outputs of system or components. Usability requirements include:

- information error messages.

- well-formed user interfaces.

3.7 Interface Requirements

3.7.1 Hardware interfaces

The system must run over the internet, all the hardware shall require to connect internet will be hardware interface for the system. As for example modem, WAN, LAN.For a website hosting an AI-powered virtual tutor, the hardware interfaces primarily relate to the server infrastructure and any additional hardware components required to support the functionality of the website. Server Hardware: The website needs server hardware to host its application and data. Storage Devices: Storage devices are needed to store various data, including user profiles, content, AI models, and session logs. Networking Hardware:Networking hardware facilitates communication between the web server and clients (users' devices) and between different server components.

3.7.2 Software interfaces

For a website hosting an AI-powered virtual tutor, software interfaces are essential components that facilitate communication between different software modules, services, and components.Software interface required for the working of the project is the appropriate operating system. Web Server Interface: The website operates on a web server, such as Apache, Nginx, or Microsoft IIS. The web server handles incoming HTTP requests from clients (users' web browsers) and serves web pages and other resources. Database Interface: The virtual tutor requires a database to store and manage various types of data, including user profiles, learning materials, session logs, and AI model parameters

3.7.3 Communication interfaces

To create a website for an AI-powered virtual tutor, you would typically need several communication interfaces to facilitate interaction between the user and the AI tutor. These interfaces may include:

User Interface (UI): The UI is the visual interface through which users interact with the website. It includes elements such as menus, buttons, forms, and other graphical elements.

Chat Interface: A chat interface allows users to communicate with the AI tutor via text input. Users can ask questions, seek clarification, or engage in conversation with the virtual tutor.

Department of Computer Science

Feedback Interface: An essential aspect of any AI-powered system is the ability to learn and improve over time. A feedback interface allows users to provide feedback on the accuracy and helpfulness of the virtual tutor's responses.

Data Input Interface: Depending on the functionality of the virtual tutor, users may need to input data such as their educational background, learning goals, or preferences.

Notification Interface: Notifications can be used to alert users about important updates, reminders, or new features related to the virtual tutor.

3.8 Security Requirements

- User accesses only their account.

- Validation of input is handled.

- This application containing the computer systems is physically secured against arms or surreptitious entry by intruders.

- Users must be authorized carefully to reduce changes of any such user giving access to an intruder in exchange for a bribe or other favour.

3.9 Platform Used

Windows 10 is a major version of the Microsoft Windows operating system that was released on July 29, 2015.It is built on the Windows NT kernel and follows windows 8.Part of the reason Microsoft decided to name the 2015 release "Windows 10"(and skipped "windows 9")is because the operating system is designed to be a new direction for Microsoft. One of the primary aims of windows 10 is to Unify the windows experience across multiple devices, such desktop computers, tablets, and smartphones. As part of this effort, Microsoft developed Windows10 Mobile alongside Windows 10 to replaces Windows Phone - Microsoft's previous mobile OS. Windows 10 also integrates other Microsoft services, such as Xbox Live and the Cortana voice recognition assistant.

3.10 Technologies Used

Html

HTML is the standard markup language for creating web pages and web applications.HTML is used to structure the content of a web page using a system of elements and tags. These elements represent various types of content such as text, images, links, forms, and multimedia. Each element is enclosed in angle brackets ¡¿ and typically consists of a start tag, content, and an end tag.

Javascript

JavaScript is a high-level programming language commonly used for creating dynamic and interactive websites. It is one of the core technologies of web

development, along with HTML (Hypertext Markup Language) and CSS (Cascading Style Sheets).

CSS

CSS, or Cascading Style Sheets, is a style sheet language used to describe the presentation of a document written in HTML or XML. CSS defines how HTML elements are displayed on screen, in print, or in other media types.

Bootstrap

Bootstrap is a popular front-end framework for building responsive and mobile-first websites. It provides a set of pre-designed HTML, CSS, and JavaScript components and utilities that developers can use to create consistent and visually appealing web interfaces quickly.

What distinguishes PHP from something like client - side Javascript is that the code is executed on the server, generating HTML which is then sent to the client. The client would receive the results of running that script, but would not know what the underlying code was. You can even configure your web server to process all your HTML files with PHP, and then there's really no way that users can tell what you have up your sleeve. The best things in using PHP are that it is extremely simple for a newcomer, but offers many advanced features for a professional programmer.

INTERVIEW CONFIDENCE LEVEL ANALYZER

PROJECT REPORT

Submitted By

STEVE WILSON

Reg. No. CCAVSCS038

for the award of the Degree of

Bachelor of Science (B.Sc.)

in Computer Science
(University of Calicut)

under the guidance of

Ms. Soumya P S

Assistant Professor

BSc. COMPUTER SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE(Autonomous)
IRINJALAKUDA, KERALA
INDIA

March 2024
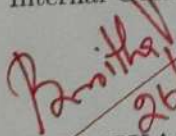
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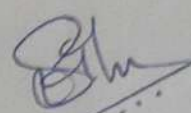
CERTIFICATE

This is to certify that the project report entitled *"Interview confidence level analyser"* is a bonafide record of the project work done by **Steve Wilson** in partial fulfillment of the requirement for the sixth semester of **Bachelor of Computer Science** in Department of Computer Science of **CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

Ms. Soumya P S
Assistant Professor,CS
Internal Guide

Ms. Sini Thomas
Head of the Department
Computer Science

26/03/2024

26/03/24

EXTERNAL EXAMINER

INTERNAL EXAMINER

DECLARATION

I hereby declare that this project work **"INTERVIEW CONFIDENCE LEVEL ANALYSER"** submitted to Christ College (Autonomous) Irinjalakuda, affiliated to Calicut University in partial fulfillment of the requirement for the award of the Bachelor of Computer Science, is a record of original work done by me, under the guidance of Ms. SOUMYA P S, Department of computer Science.

Place: Irinjalakuda   STEVE WILSON

ACKNOWLEDGEMENT

First and foremost I like to thank Lord almighty for his providence and for being the guiding light throughout the project. I wish to express my sincere gratitude to our beloved Department head for giving me all the facilities for our project. I take this opportunity to express my gratitude to the class teacher Ms. RASMI P M and head of the department Ms. SINI THOMAS who has been supported me throughout the course of this project. I am thankful for her aspiring guidance and valuable advice during the project work. I express my sincere thanks to my project guide Ms. SOUMYA P.S for supporting and guiding throughout the project.I would take this opportunity to specially thank all other faculty members for their constant and continuous motivation. Finally I would like to thank my family and friends for giving valuable advice and moral support throughout our project.

ABSTRACT

INTERVIEW CONFIDENCE LEVEL ANALYSER is a web application that uses advanced technologies to assess interviewee confidence during video interviews. It uses computer vision techniques to capture real-time video data, including facial landmark detection, to predict interviewee confidence levels. The system's user interface is intuitive and user-friendly, allowing interviewers to customize confidence level thresholds. Real-time feedback is displayed throughout the interview, aiding decision-making and adaptability. The application is designed with ethical considerations in mind, including user authentication, informed consent, and privacy protection. The technology stack ensures scalability, flexibility, and compatibility with various deployment platforms. The application aims to modernize interview assessments, providing valuable insights to improve the hiring process.

Contents

Chapter 1

1 Introduction

The project aims to revolutionize interview evaluation by utilizing computer vision and machine learning to analyse the confidence levels of interviewees through a webcam-based system. The human face is a rich source of non-verbal cues, and movements of the eyes and head can indicate an individual's confidence level during an interview. By leveraging webcam technology, the project aims to capture and interpret these subtle cues in real-time, providing a comprehensive and objective assessment of an interviewee's confidence throughout the interview process.

The methodology involves facial landmark detection algorithms to precisely track the movements of key facial features, such as the eyes and nose. By analysing parameters like blink rate, gaze direction, and head tilt, a machine learning model can be developed capable of discerning patterns associated with varying confidence levels.

This project not only refines the interview assessment process but also addresses the limitations of traditional subjective evaluations. The real-time nature of the approach enables immediate feedback, allowing interviewers to adapt their strategies and create a more conducive environment for candidates. Ethical considerations surrounding the use of personal data and privacy and consent are paramount in the methodology.

1.1 Overview

Machine learning is being used in video interviews to analyse and quantify interviewee confidence levels. By tracking facial landmarks, the system extracts key features like gaze direction, and head tilt. This real-time feedback allows interviewers to adapt their strategies based on objective data. Ethical considerations, informed consent, and privacy protection are integral to the methodology, contributing to the evolution of interview assessment practices. There is a registration and login page. Visual representation of analysis as pie chart and graph are the features we provide. Tips and guidance is also provided.

Chapter 2

2 System Analysis

2.1 Purpose

The ability to assess an interviewee's confidence level is crucial in various domains, including job interviews, psychological evaluations, and public speaking engagements. Traditional methods of gauging confidence often rely on subjective judgments or self-reporting, which can be unreliable. This project proposes a novel approach to assess confidence levels by analysing eye movements and facial expressions captured through a webcam during interviews. By employing computer vision and machine learning techniques, this system aims to provide objective and real-time feedback on the interviewee's confidence, enabling more informed decision-making by interviewers. The project involves the development of algorithms for detecting and interpreting relevant facial cues and eye movements indicative of confidence levels, followed by the implementation of a user-friendly interface for interaction. The effectiveness of the system will be evaluated through experimental studies, comparing its assessments with human judgments and self-reported confidence levels. The outcomes of this project have the potential to enhance interview processes, improve interviewer training, and contribute to advancements in human-computer interaction and affective computing.

2.1.1 Proposed System

The proposed system aims to revolutionize the interview process by introducing a real-time confidence level testing mechanism. Leveraging the capabilities of webcam technology, the system analyses interviewee's eye movements and facial expressions to gauge their confidence levels during the interview. Based on the analysis of facial expressions and eye movements, the system will assign a confidence score to the interviewee, indicating their level of confidence during the interview. The results of the confidence level assessment will be presented visually using bar charts and pie charts. Bar charts can display the distribution of confidence levels among interviewees, while pie charts can show the proportion of different confidence levels.

2.2 Problem definition

To know what the problem is and what the needs are before developing it.

2.3 Feasibility Study

A feasibility study for a project involving the testing of interviewees using a webcam to detect eye movements and facial expressions would typically assess the

viability and practicality of such a venture. Testing interviewees using webcam technology to analyse eye movements and facial expressions.

2.3.1 Technical Feasibility

Assessing the availability and reliability of eye tracking and facial expression detection technologies. This may involve researching existing algorithms and software libraries for analyzing eye movements and facial expressions

2.3.2 Economical Feasibility

Estimating the development costs for creating the software or system required for the project. This would include factors such as software development, hardware acquisition, and ongoing maintenance costs. Potential revenue streams could come from offering the system as a service to organizations conducting interviews or through licensing fees.

2.3.3 Operational Feasibility

Conducting user acceptance testing with interviewers to ensure that the system provides accurate results. Training programs may be required to familiarize users with the system and its capabilities. Integration with existing interview processes and workflows would also need to be considered to ensure seamless adoption of the technology.

Chapter 3

3 Software Requirement Specification

3.1 Purpose

The Software Requirements document outlines the functional and non-functional requirements of the "Interview Confidence Level Analyzer" project. It serves as a blueprint for the development team, ensuring a clear understanding of the system's objectives, features, and constraints.

3.2 Scope

The software is designed to analyse interviewee confidence levels during video interviews using computer vision and machine learning techniques. The scope includes real-time feedback provision to interviewers based on facial landmarks, eye movement, and head posture analysis.

3.3 Overall Description

The "Interview Confidence Level Analyzer" is an innovative software system designed to revolutionize the assessment process of interviewee confidence during video interviews. This section provides an overview of the project's perspective, functionality, users and characteristics.

3.3.1 Product Perspective

The "Interview Confidence Level Analyzer" is positioned as a standalone software system designed to operate seamlessly within the context of video interviews. It serves as an innovative addition to traditional interview assessment methods by introducing real-time confidence level analysis through computer vision and machine learning technologies.

3.3.2 Product Functionality

The "Interview Confidence Level Analyzer" is rich in features aimed at providing a comprehensive and objective analysis of interviewee confidence levels as visual representation.

3.3.3 Users and Characteristics

There are two types of users that interact with the webpage are interviewers and interviewees. The users can analyse their confidence level which will be represented as pie chart and bar chart.

3.4 Specific Requirements

3.4.1 Hardware Requirements

- Processor: i3 or above
- Webcam: *Standard*
- Speed: Above 1GHz
- RAM capacity: 512 MB
- Hard Dsk drive: 40 GB
- Keyboard: Standard
- Mouse: Standard
- Monitor: SVGA Color

3.4.2 Software Requirements

- Operating System:Windows or ubuntu
- Languages used: PHP
- Database : *MySql*
- Technologies used: HTML,Javascript,CSS,Bootstrap,Django,Tensorflow,opencv

3.5 Functional Requirements

User Management

The system shall support user authentication for interviewers.

Video Data Processing

The system shall capture video data through a connected webcam during interviews. Facial landmark detection algorithms shall be employed to track eyes and head movements.

Feature Extraction

The system shall extract features from facial landmarks, including blink rate, gaze direction, and head tilt. Feature extraction shall be performed in real-time during interviews.

3.6   Non Functional Requirements

Non-functional requirements define the overall qualities or attributes of the resulting system. Non-functional system place restrictions on the product being developed, the developed process, and specify external constraints that the product must meet. The principal non - functional constraints which are relevant to critical systems:

- Performance

- Reliability

- Security

- Safety

- Usability

Performance
The system shall provide real-time feedback with a response time of less than one second.

Reliability

- Reliability is the ability of a system to perform its required function under stated conditions for a specified period of time.

- The system shall be available 99% of the time.

Safety
Safety requirements are not required which exclude unsafe situation from the possible solution of the system.

Usability
Usability is the ease with which a user can learn to operate, prepare inputs for, and interpret outputs of system or components. Usability requirements include :

- information error messages.

- well-formed user interfaces.

3.7 Interface Requirements

3.7.1 Hardware interfaces

The system must run over the internet, all the hardware shall require to connect internet will be hardware interface for the system. As for example modem, WAN-LAN.

3.7.2 Software interfaces

Software interface required for the working of the project is the appropriate operating system.

3.7.3 Communication interfaces

The user of the site communicate using the network connectivity and the data set is accessed

3.8 Security Requirements

- User accesses only their account.

- Validation of input is handled.

- This application containing the computer systems is physically secured against arms or surreptitious entry by intruders.

- Users must be authorized carefully to reduce changes of any such user giving access to an intruder in exchange for a bribe or other favour.

3.9 Platform Used

Visual Studio Code (VS Code) is a lightweight, open-source source code editor developed by Microsoft, offering essential tools and integration for developers working on various programming languages and platforms. Its minimalist user interface provides a distraction-free environment for coding, while its cross-platform compatibility ensures a consistent development experience. VS Code's extensive support for extensions allows users to customize their development environment with language-specific tools, themes, and debugging utilities. The integration of IntelliSense enhances coding efficiency, while the built-in terminal allows for command-line tasks and Git integration for version control operations. Despite not being a full-fledged IDE, VS Code's versatility, extensibility, and popularity make it a preferred choice for many developers.

3.10 Technologies Used

Django (Python)

- Django is a high-level Python web framework that facilitates rapid development and follows the Model-View-Controller (MVC) architectural pattern. It's suitable for building the backend of your application, handling tasks like user authentication, data storage, and server-side logic.

HTML, CSS, Bootstrap

- HTML (HyperText Markup Language) is used for structuring the content of web pages.

- CSS (Cascading Style Sheets) is employed for styling and layout to enhance the visual presentation.

- Bootstrap is a front-end framework that simplifies the design process, providing pre-designed components and a responsive grid system

JavaScript, jQuery

- JavaScript is a scripting language that enables dynamic and interactive elements on web pages.

- jQuery is a JavaScript library that simplifies DOM manipulation and event handling. It can streamline client-side scripting tasks.

TensorFlow, Keras

- TensorFlow is an open-source machine learning framework developed by Google. It is used for building and training machine learning models.

- Keras is a high-level neural networks API that runs on top of TensorFlow. It simplifies the process of building and training deep learning models.

OpenCV

- OpenCV (Open Source Computer Vision Library) is a powerful library for computer vision tasks. It can be used for video data processing and facial landmark detection.

Chapter 4

4   Design Document

4.1   Purpose

In interviews, assessing an interviewee's confidence is crucial for hiring decisions and academic evaluations. Traditional methods often rely on subjective judgments or self-reported measures, influenced by biases and cultural differences. Advancements in computer vision and machine learning have enabled systems to accurately analyse facial expressions and body language, inferring emotional states and cognitive processes. This project proposes a novel approach to confidence level testing by analysing eye movements and facial expressions captured through a webcam.

4.2   Scope

The project focuses only on analysing the interviewee's eye movements and facial expressions via webcam feed to determine their confidence level during the interview process.The project will utilize readily available libraries and frameworks for webcam access, facial recognition, and data visualization. Implementation will be limited to the capabilities provided by the selected technologies. It will use Python and Django for backend development and data visualization respectively.

4.3   Overview

The purpose of this document is to help the reader to visualize the solution to the project presented. This document verifies how the design meet the requirement stimulated in the SRS document through design viewpoints. The design viewpoints will cover all design elements presented before. This document will provide a direct approach to the development of this project hence reducing feature creep and ponitedly determine the quality of the design.

4.4   Data Design

Database are the storehouses of data used in the software systems.The data is stored in tables inside the database.Several tables are created for the manipulation of the data for the system.Two essential settings for a database are

- Primary Key- The field that is unique for all the record occurrence.

- Foreign Key- The field used to set relation between tables.

Normalization

- Normalization is the process of organizing the data in the database.

- Normalization is used to minimize the redundancy from a relation or set of relations. It is also used to eliminate the undesirable characteristics like Insertion, Update and Deletion Anomalies.

- Normalization divides the larger table into the smaller table and links them using relationship.

- The normal form is used to reduce redundancy from the database table.

Tables

Accounts

username	varchar(50)	Notnull	Name of users
email	varchar(100)	Notnull	Email of the users
password	varchar(250)	Notnul	Password of users

Chapter 5

5 Development of the System

Developing a system for confidence level testing of an interviewee using a webcam involves several steps, including setting up the environment, capturing and processing webcam data, analysing eye movements and facial expressions, and presenting the results using bar charts and pie charts.

C-JOBS

PROJECT REPORT

Submitted By

VIVIN ROY

Reg. No. CCAVSCS039

for the award of the Degree of

Bachelor of Science (B.Sc.)

in Computer Science
(University of Calicut)

under the guidance of

Mr.Linto George

Assistant Professor

BSc. COMPUTER SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
CHRIST COLLEGE(Autonomous)
IRINJALAKUDA, KERALA
INDIA

March 2024

DEPARTMENT OF COMPUTER SCIENCE

CHRIST COLLEGE (AUTONOMOUS)

IRINJALAKUDA

CERTIFICATE

This is to certify that the project report entitled *"C-JOBS"* is a bonfied record of the project work done by **Vivin Roy** in partial fulfillment of the requirement for the sixth semester of **Bachelor of Computer Science** in Department of Computer Science of **CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

Mr.Linto George
Assistant Professor,CS
Internal Guide

Ms. Sini Thomas
Head of the Department
Computer Science

26/3/24

EXTERNAL EXAMINER

26/3/24

INTERNAL EXAMINER

DECLARATION

I hereby declare that this project work **"C-JOBS"** submitted to Christ College (Autonomous) Irinjalakuda, affiliated to Calicut University in partial fulfillment of the requirement for the award of the Bachelor of Computer Science, is a record of original work done by me under the guidance of Mr.LINTO GEORGE, Department of computer Science.

Place: Irinjalakuda   VIVIN ROY

ACKNOWLEDGEMENT

First and foremost I like to thank Lord almighty for his providence and for being the guiding light throughout the project. I wish to express my sincere gratitude to our beloved Department head for giving me all the facilities for our project. I take this opportunity to express my gratitude to the class teacher Ms. RASMI P.M and head of the department Ms. SINI THOMAS who has been supported me throughout the course of this project. I thankful for her aspiring guidance and valuable advice during the project work.I express my sincere thanks to my project guide Mr.LINTO GEORGE for supporting and guiding throughout the project.I would take this opportunity to specially thank all other faculty members for their constant and continuous motivation. Finally I would like to thank my family and friends for giving valuable advice and moral support throughout my project.

ABSTRACT

C-JOBS is a innovative website introduced to manage and automates the placement procedures at Christ College(Autonomous) Irinjalakuda. The website is enriched with three kind of login facilities - admin login, student login, faculty login.,The portal allows students to explore job vacancies, apply for jobs, view training programs, and access various study materials. Faculty members, designated as administrators, have the authority to manage students, faculty, courses, departments, jobs, placed students, and training programs. All these features make this website more adaptable and user-friendly.

Contents

Chapter 1

1 Introduction

The C-JOBS project is a software application designed to streamline and automate the process of managing placements for students in educational institutions. C-JOBS is designed to help students for applying jobs. It will help to apply for the job were they fit in . This project helps the training and placement officers to overcome the difficulty in keeping records of hundreds and thousands of students and searching the eligible students for recruitment, based on various eligibility criteria of different companies .This enables you to plan placements, train students in accordance with relevant market demands, organize placement drives, and allow companies to recruit students.

1.1 Overview

The main objective of the C-JOBS is to manage the details of the Student and Placement Cell, to reduce manual work and time. This project is a Python Django-based web application for managing a college job portal. The portal allows students to explore job vacancies, apply for jobs, view training programs, and access various study materials. Faculty members, designated as administrators, have the authority to manage students, faculty, courses, departments, jobs, placed students, and training programs.

Chapter 2

2   System Analysis

2.1   Purpose

The main purpose of this website is to create a website of Placement Management System which is owned by Placement cell. The benefit of this website is very high because the college can use this website for a well maintained Placement Management System.

2.1.1   Existing System

The traits of the earlier working model and their drawback are described in the existing system. The existing system does all processes manually. Placement officers record the data of students. If any alterations or updates are necessary in the profile of any student, it has to be done manually. This is tedious and time-consuming, lacks the security of data, took more manpower, consumes a large volume of paper and space. When the number of users increases, then this method is very problematic. In the previous system placement officer has to collect student details for placements. Approving those student details takes a lot of time.Implementing a digital placement management system can automate and streamline these processes,making them more efficient,transparent,and accessible to all stakeholders involved

2.1.2   Proposed System

The proposed system can overcome all the limitations of the existing system, such as student's information is maintained in the database, it gives more security to data, ensures data accuracy, reduces paper work and save time, it makes information flow efficient and paves way for easy report generation, reduce the space, proposed system is cost effective. Placed student details , reviews and other statistic information will be displayed. Filtering student profiles based on companies requirements. It is easy for students to get information of newer placement programs.Students can explore job vacancies, view detailed listings, apply online, and upload their resumes and they can view and access available training programs to enhance their skills. The portal provides access to various study materials to support student learning.

2.2   Problem definition

To know what the problem is and what the needs are before developing it. Here we design a website of C-JOBS for maintaining Placement Procedure.Students choose a specific college where the placement will be held,there is a need to maintain all these papers,causing large amount of space.It is manually done,chances of missing.difficult to handle the details of student.

2.3 Feasibility Study

After the problem is clearly understood and solutions proposed, the next step is to conduct the feasibility study. Feasibility study is defined as evaluation or analysis of the potential impact of the proposed project or program. The objective is to determine whether the proposed system is feasible. A feasibility study for a placement managment system project might include schedule feasibility and economical feasibility.The schedule feasibility might include ,How likely the project is to be completed within its proposed time frame and the economical feasibility, A check for the high investment incrurred for the system.There are three aspects of feasibility study to which the proposed system is subjected as discussed below.

2.3.1 Technical Feasibility

Technical feasibility assess whether the current technical resources are sufficient for the new system. We can upgrade the level of technology for supporting our website. We check whether the proposed system can be implemented in the present system without supporting the existing hardware.

2.3.2 Economical Feasibility

Economic feasibility determines whether the time and money are available to develop the system. There is no additional hardware used to develop the site, it is inexpensive to build.

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Operational feasibility determines if the human resources are available to operate the system once it has been installed. No extra training is needed to use this system. Anyone who has knowledge in internet in English language can easily use the system. The resources that are required to implement or install are already available with the organization.

Chapter 3

3 Software Requirement Specification

3.1 Purpose

The purpose of this document is to give a detailed description of the requirements for the website of C-JOBS. It illustrates the purpose and complete description for the development of the system. It explains system constraints, interface and interactions with other external applications. This document is primarily intended to be proposed to a college for maintaining placement cell. The C-JOBS is a software solution that helps colleges and companies manage their hiring and recruitment processes.

3.2 Scope

The project has a wide scope. Our project mainly helps in improving productivity and makes use of utilization of resources. There is no duplication of work as this was not the case when done manually. Thus it reduces labor and increases morale. The system intends userfriendly operations which may resolve ambiguity. The project is a total management and informative system, which provides the up-to-date information of all the students in the college. Our system also help the college to overcome the difficulty in keeping records of hundreds of students and searching for a student eligible for recruitment criteria from the whole thing. It helps in effective and timely utilization of resources. The project facilitates userfriendly, reliable and fast management system. The placement officer itself can carry out operations in a smooth and effective manner. They need not concentrate on record keeping. The college can maintain computerized records thus reducing paper work, time and money. We can get all information about the placement cell by having a look at this website.

3.3 Overall Description

This section give an overview of our website, C-JOBS.The main objective of the placement management system is to reduce manual work and time. It is difficult and time-consuming to collect all the details from each student. To avoid this problem we have planned to develop a web-based placement management system. This project is designed for managing placement cell. The portal allows students to explore job vacancies, apply for jobs, view training programs, and access various study materials. Faculty members, designated as administrators, have the authority to manage students, faculty, courses, departments, jobs, placed students, and training programs. Student, admin and teachers are also getting equal participation in uploading unique functions in it and also separate login is also provided.

C-JOBS

PROJECT REPORT

Submitted By

LAKSHMI P.K

Reg. No. CCAVSCS040

for the award of the Degree of

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