B.Sc. Engg. Project

Project Title: Face Recognition Attendance System

Group: 05

by

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Acknowledgment

We would like to pay our gratitude to the Almighty Allah who created us with all the abilities to understand analysis and develop the process with patience. We are thankful to our project supervisor Humayra Ferdous, Lecturer, Department of Computer Science and Engineering , Bangladesh University of Business and Technology for her professional guidance and motivation during the work of this project which is a major part of it. Without her valuable support and guidance, this project could not reach this level of development from our point of view.

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Abstract

A face recognition attendance system is a technological solution that uses facial recognition technology to mark the attendance of individuals. It works by capturing an image of a person's face, analyzing and comparing it with previously stored data to identify the individual. The system can be integrated with a variety of devices such as cameras, mobile phones, and computers.The face recognition attendance system offers several benefits over traditional attendance methods. It eliminates the need for manual record-keeping, reduces the risk of errors, and provides real-time data on attendance. In this project, a face database is created and data is uploaded to the recognition algorithm. They then compared their faces to the database to find identities across 4,444 visits. When a person is identified, their existence is deleted and the information required by the is automatically recorded in an Excel sheet. At the end of the day, an Excel spreadsheet containing entries of all individual attendance information was sent to the relevant instructor.

Declaration

We declare that the project title, **Face Recognition Attendance System** and the work presented in it our own.we confirm that:

We,hereby declare that the discussion entitled,**Face Recognition Attendance System** being submitted by us towards the partial fulfillment of the requirement for the course of Artificial Intelligence and Expert Systems Lab,Department of Computer Science and Engineering is a project work carried by us under the supervisior of Humayra Ferdous Mam and have not been submitted anywhere else.We will be the responsible if any mistake found there .

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Copyright

Dedication

Dedicated to our parents, teachers, friends and who loved us for all their love and inspiration.

Certificate

This is to certify that Copyright by Tamima Nisat (ID: 19202103309), Al Rifat Hasan (ID: 19202103311), Md. Akhlaq Hossain (ID: 19202103293), Md. Zillur Rahaman (ID: 19202103296), Nasir Uddin (ID: 19202103316) and Neyamul Haque (ID: 19202103320) were belong to the department of Computer Science and Engineering, have completed their Project on **Face Recognition Attendance System** satisfactorily in partial fulfillment for the requirement of Bachelor of Science in Computer Science and Engineering of Bangladesh University of Business and Technology in the year 2023.

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Approval

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Chapter 1

Introduction

1.1 Introduction

Facial recognition is a part of biometric identification that uniquely identifies a person by extracting facial features and storing them as a unique facial fingerprint. Barometric face recognition technology has attracted the attention of many researchers because of its wide range of applications. Currently, facial recognition technology is being implemented on Facebook and other social networks at airports and train stations. under criminal investigation. Facial recognition technology can also be used to report crime. Captured photos can be stored in a database and can be used to identify a person. For facial recognition, we need a huge data set and complex functionality to recognize a person in all conditions such as lighting, age, posture, and other changes. Recent research showed improvements in facial recognition systems.

However, most face recognition methods are only the number of people in one frame can work normally provides correct face positioning and sharp images in low and controlled lighting conditions. for face recognition Depending on the purpose, large data sets and complex data are required. Ability to uniquely identify different items Manipulate various obstacles such as lighting and posture and aging. well over the years. Improved face recognition system. You can compare it to the last 10 years. Tremendous advances in the world of face recognition. Most face recognition systems today are fine with a limited number of faces in the frame. Additionally, the technology was tested under controlled lighting. Conditions, correct face

poses and not blurry images. The face recognition system proposed in this paper. For attendance, the system can recognize multiple faces.

1.2 Background

Facial recognition technology has been used in a wide variety of applications, including security, surveillance, and time and attendance systems. In recent years, the use of artificial intelligence (AI) and machine learning techniques has dramatically improved the accuracy and efficiency of facial recognition systems. A facial recognition system is an automated system that uses biometric technology to identify and track employee or student attendance. The technology uses unique facial features, such as the distance between the eyes, nose and mouth, to create unique patterns or "face prints" that can be used to identify individuals. The technology background includes research in computer vision, pattern recognition and biometrics, as well as the development of powerful artificial intelligence algorithms and machine learning techniques. With the availability of high-quality cameras and the increased computing power of modern devices, the use of facial recognition in time and attendance systems has become more practical and cost effective.

1.3 Statement of problem

A face recognition attendance system AI project that aims to solve is the efficient and accurate tracking of attendance for a large group of individuals, such as employees or students. Traditional attendance systems, such as sign-in sheets or ID card scanners, can be time-consuming, error-prone, and open to fraud. They also lack the ability to provide real-time attendance data and generate useful attendance reports. A face recognition attendance system, on the other hand, can automate the process of tracking attendance and provide accurate, real-time data. The use of AI and machine learning techniques can further improve the accuracy and efficiency of the system by allowing it to learn and adapt to changes in an individual's appearance, such as changes in hairstyle or facial hair. The problem statement of this project is to develop a face recognition attendance system that is accurate, efficient, secure, and easy to use, and that

can provide real-time attendance data and generate useful attendance reports.

1.4 Purpose of study

To design and develop a face recognition attendance system that utilizes AI and machine learning techniques to accurately and efficiently track the attendance of employees or students. The system will use a camera to capture images of individuals, and then use AI algorithms to extract and analyze facial features to identify and match individuals with their records in a database. The system will also be designed to handle large amounts of data and scale to accommodate a growing number of individuals. The purpose of this study is to create a system that can improve the efficiency and accuracy of attendance tracking while also providing real-time attendance data and generating useful attendance reports. Additionally, this study aims to explore the feasibility of using this technology in a real-world setting, and to evaluate its performance in terms of accuracy, efficiency, security, and user-friendliness. Overall, this project aims to provide a practical solution for tracking attendance, and to contribute to the advancement of AI and machine learning technology in the field of biometrics.

1.5 Scope

The scope of this face recognition attendance system AI project includes the design, development, and evaluation of a system that can accurately and efficiently track the attendance of employees or students using AI and machine learning techniques. The system will be designed to work with a camera to capture images of individuals, and use AI algorithms to extract and analyze facial features to identify and match individuals with their records in a database. The system will also be designed to handle large amounts of data and scale to accommodate a growing number of individuals. The scope of this project includes the following:

- Research and development of AI algorithms for facial recognition and feature extraction.
- Design and implementation of a database to store and manage the facial templates of individuals.

- Development of a user interface for the system, which will be used for enrolling new individuals, managing records, and viewing attendance reports.
- Integration of the system with existing attendance systems, such as time and attendance software, to provide real-time attendance data.
- Testing and evaluation of the system's performance in terms of accuracy, efficiency, security, and user-friendliness.

The project is limited to the implementation of a face recognition attendance system, and will not include other biometric modalities such as fingerprint or iris recognition. Additionally, this project will focus on the technical aspects of the system and will not include a study of its social or ethical implications.

Chapter 2

Liturature Review

2.1 Review of Face recognition and attendance system

Face recognition and attendance system is an innovative and efficient solution for attendance tracking. The system uses facial recognition technology to identify individuals and record their attendance, eliminating the need for manual record-keeping. This makes it a highly effective solution for organizations that need to track attendance of large numbers of people.
However, there are also concerns about the use of facial recognition technology, including privacy and security concerns. All in all, face and attendance recognition systems are highly effective and innovative attendance tracking solutions.

2.2 Justification of study

The study of face recognition and attendance system is important for several reasons.the system offers an efficient and accurate way of tracking attendance, eliminating the need for manual record-keeping which can be time-consuming and prone to errors. This can save organizations significant time and resources, especially for those with large numbers of employees or students.

Thirdly, the study of this system can lead to improvements in the technology and its applications. By understanding the limitations and potential biases of facial recognition technology, researchers can work towards improving the accuracy and reducing the risks

associated with its use.

Secondly, the use of facial recognition technology in attendance tracking has the potential to enhance security and prevent fraud. By accurately identifying individuals, the system can prevent individuals from falsely recording attendance for themselves or others, which can be a significant issue in some organizations.

Additionally, the adoption of this system can lead to increased automation and integration in various industries, including education, healthcare, and finance. This can result in more streamlined and efficient processes, leading to increased productivity and cost savings.

Overall, the study of face recognition and attendance system is important for its potential to enhance accuracy, security, and efficiency in attendance tracking. Additionally, it can lead to improvements in the technology and its applications, as well as increased automation and integration in various industries.

Chapter 3

Technologies

3.1 Software

3.1.1 Visual Studio Code

Visual Studio Code, also commonly referred to as VS Code, is a source-code editor made by Microsoft with the Electron Framework, for Windows, Linux and macOS.Visual Studio Code is a streamlined code editor with support for development operations like debugging, task running, and version control.Visual Studio Code is a free source code editor that fully supports Python and useful features such as real-time collaboration. It's highly customizable to support your classroom the way you like to teach. Visual Studio Code is a source-code editor that can be used with a variety of programming languages, including C, C, C++, Fortran, Go, Java, JavaScript, Node.js, Python, Rust. It is based on the Electron framework, which is used to develop Node.js web applications that run on the Blink layout engine.

Figure 3.1: visual Studio Code

3.1.2 Microsoft Excel

Microsoft Excel is a spreadsheet developed byMicrosoft for Windows, macOS, Android, iOS and iPadOS. It features calculation or computation capabilities, graphing tools, pivot tables, and a macro programming language called Visual Basic for Applications. Excel forms part of the Microsoft 365 suite of software.Excel is an incredibly powerful tool for getting meaning out of vast amounts of data. But it also works really well for simple calculations and tracking almost any kind of information. The key for unlocking all that potential is the grid of cells. Cells can contain numbers, text, or formulas.

Figure 3.2: Microsoft Excel

3.2 Language

3.2.1 Python

Python is a high-level programming language that is widely used in a variety of applications, including web development, scientific computing, data analysis, and machine learning. It is known for its simplicity and ease of use, which makes it an ideal language for beginners to learn. Python's syntax is clear and concise, making it easy to read and write code quickly. It also has a large and active community of developers who contribute to its libraries and packages, making it easy to find resources and support for any project. Overall, Python is a versatile language that is used by developers and researchers in many different fields.

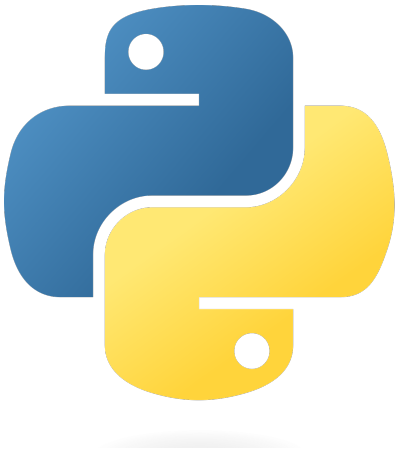

Figure 3.3: Python

PYTHON MODULES that we used :

(All the modules are installed using Command Prompt)

- pip install tk-tools
- pip install opencv-contrib-python
- pip install datetime
- pip install pytest-shutil
- pip install python-csv
- pip install numpy
- pip install pillow
- pip install pandas
- pip install times

Chapter 4

Implementation

4.1 General Pages

In our homepage,

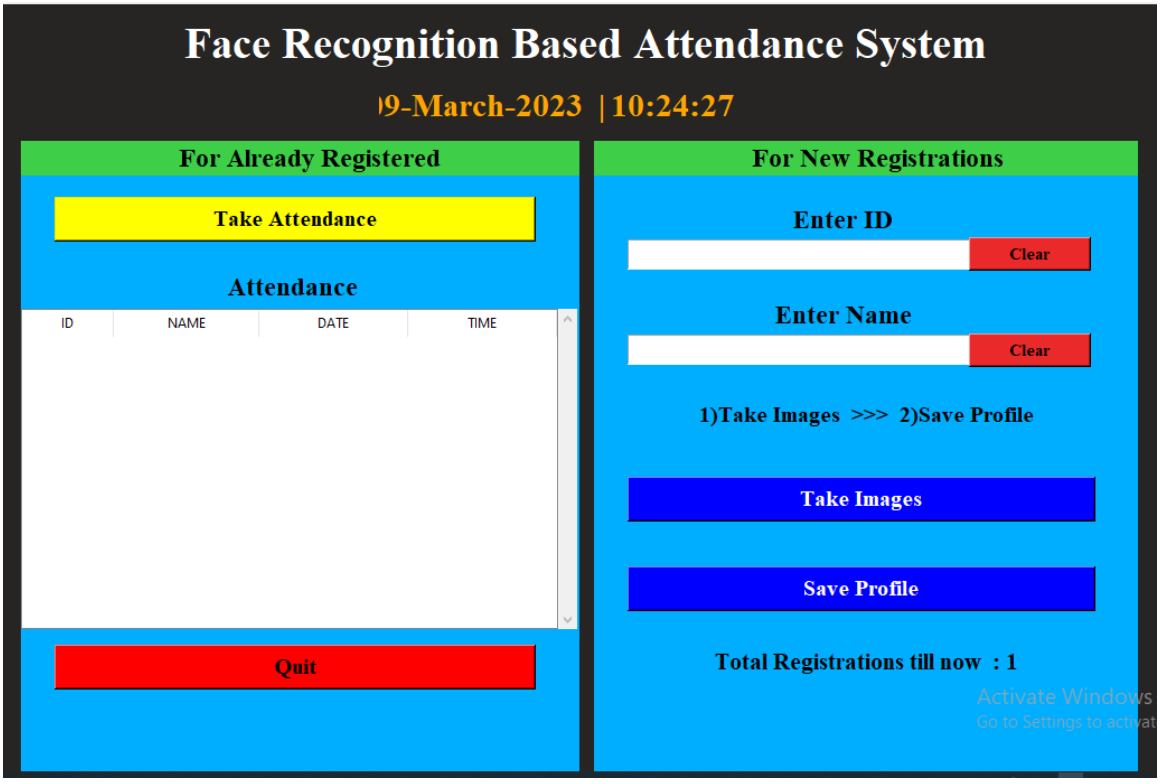

Figure 4.1: Home Page

In our registration page,

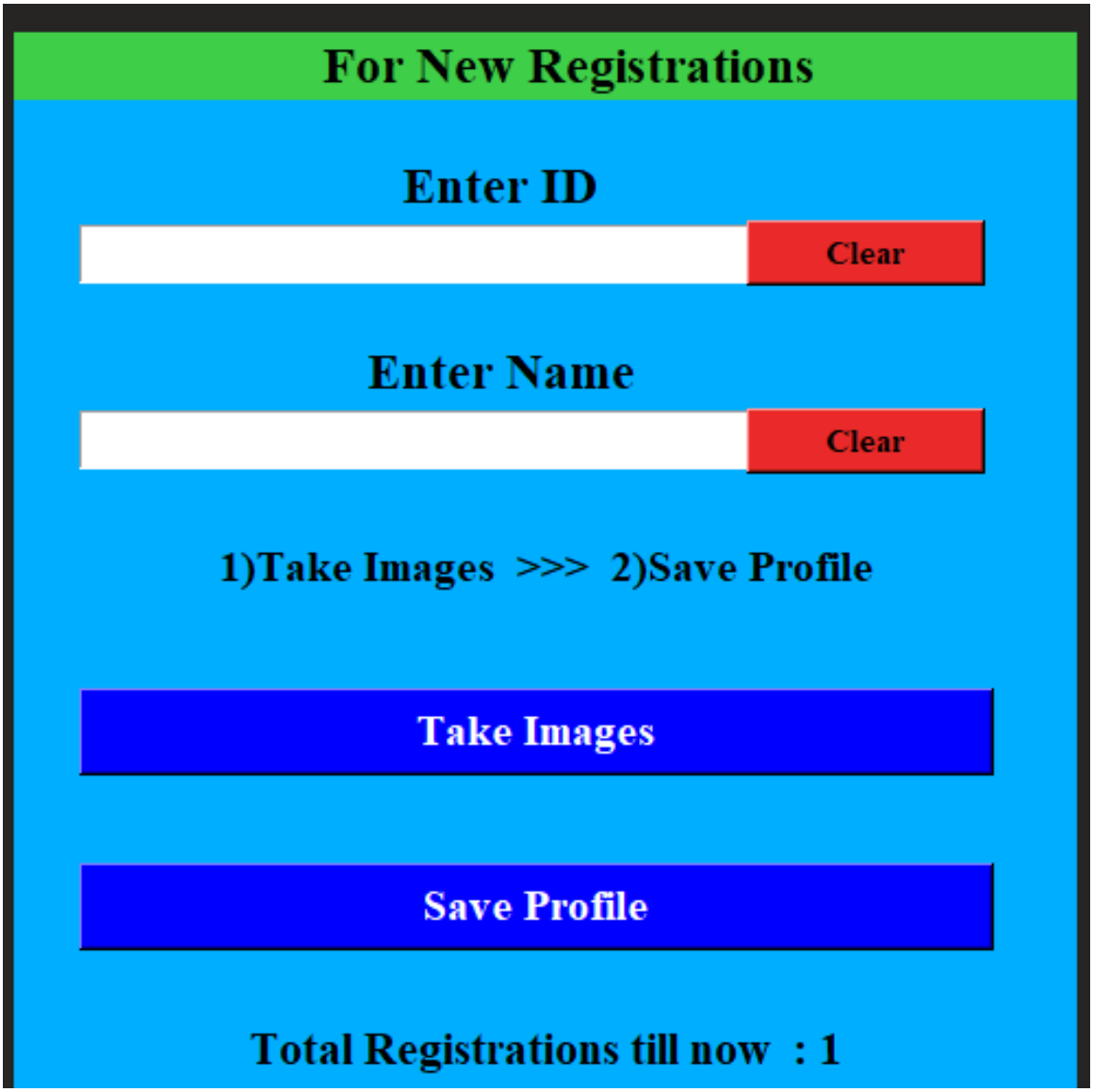

Figure 4.2: Registration Page

Chapter 5

Conclusion

5.1 Future Scope

The future scope of face recognition and attendance system is quite promising as it has many potential applications in various industries. Some of the future applications of face recognition and attendance system are:

- Education: Face recognition technology can be used in schools and universities for monitoring student behavior and performance, and preventing unauthorized access.
- Banking: Face recognition technology can be used in banking for identity verification and fraud detection.
- Government: Face recognition technology can be used by governments for citizen identification, border control, and law enforcement.

Additionally, facial recognition and attendance systems have a bright future and will continue to play an important role in a variety of industries, making them more efficient, secure and personalized. However, it is important to design and use these systems responsibly to protect the privacy and security of individuals.

5.2 Conclusion

In conclusion, face recognition and attendance system is a promising technology that has the potential to revolutionize various industries, including security, healthcare, education, banking, retail, transportation, and government. This technology can help to increase efficiency, improve security, provide personalized experiences, and reduce costs.However, it is also important to recognize the potential privacy and security concerns associated with the use of this technology. Therefore, it is essential to ensure that these systems are developed and implemented responsibly, with appropriate safeguards in place to protect individuals' privacy and prevent misuse.

Overall, the face recognition and attendance system is a powerful tool that has the potential to offer numerous benefits while also requiring careful consideration and responsible use.