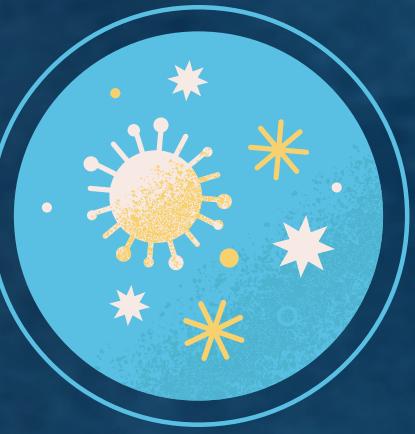


ATTENDANCE USING COMPUTER VISION

INTRODUCTION

- The project of digital attendance using computer vision aims to revolutionize traditional attendance tracking methods by leveraging advanced image processing and machine learning algorithms.
- By employing computer vision technology, the project seeks to automate the process of capturing attendance data in various contexts, such as educational institutions, workplaces, or events.
- The project focuses on developing a system that can accurately detect and recognize individuals in real-time using cameras or video feeds. By analyzing the acquired images or video frames, the system identifies and locates human faces through face detection algorithms.





TRADITIONAL METHODS

PAPER BASED

X

In paper-based systems, attendance is typically recorded on physical attendance sheets or registers.

Limitations:

- **Time-Consuming:** Taking attendance manually on paper requires significant time, especially in large groups or events.
- **Cumbersome Management:** Paper-based records need to be manually compiled, organized, and stored, leading to administrative burdens.
- **Prone to Errors:** Manual data entry is susceptible to human errors, such as misspelled names, illegible handwriting, or incorrect tallying.
- **Difficult to Access and Update:** Retrieving and updating attendance records stored on paper can be challenging, leading to delays and potential inaccuracies.
- **Lack of Real-time Data:** Paper-based systems do not provide real-time attendance information, making it difficult to monitor attendance promptly or respond to attendance-related issues in a timely manner.





TRADITIONAL METHODS

MANUAL ENTRY

X

In manual entry systems, attendance is recorded by an individual, often using a computer or attendance management software.

Limitations:

- **Data Entry Errors:** Manual entry is prone to errors, such as typos, duplicate entries, or missing records.
- **Time-Consuming:** Manually entering attendance data for each individual can be time-consuming, especially in larger groups or frequent attendance recording.
- **Dependence on Human Effort:** Manual entry relies on individuals to record attendance accurately, which can be subjective and inconsistent.
- **Lack of Real-time Data:** Similar to paper-based systems, manual entry systems typically lack real-time attendance data, limiting immediate access and monitoring capabilities.
- **Limited Scalability:** Scaling manual entry systems to handle larger attendance volumes can become increasingly challenging and inefficient.

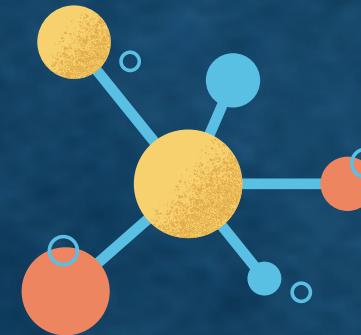


OVERVIEW OF COMPUTER VISION

- Computer vision is a field of artificial intelligence and computer science that focuses on enabling computers to gain a high-level understanding of visual information from digital images or video.
- In the context of attendance tracking, computer vision plays a crucial role in automating the process by analyzing images or video feeds to identify and recognize individuals.
- Computer vision relates to attendance tracking by utilizing image processing and machine learning algorithms to detect and recognize human faces, associating them with attendance records.



BENEFITS



ACCURACY AND RELIABILITY

Computer vision algorithms can accurately detect and recognize individuals, minimizing errors associated with manual data entry or roll call. The system can identify individuals even in crowded environments, ensuring accurate attendance records.

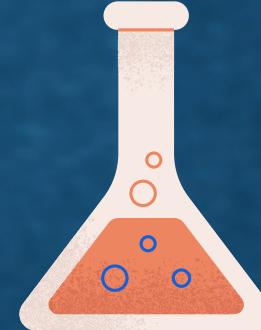
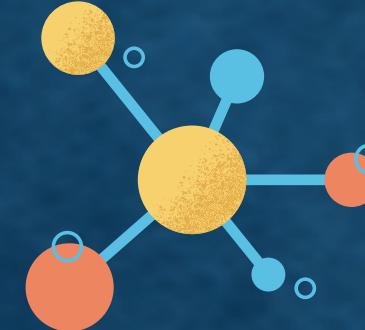
TIME AND RESOURCE EFFICIENCY

Automated attendance tracking using computer vision eliminates the need for manual data entry or roll call, saving time for both attendees and administrators. The process is streamlined, allowing resources to be allocated more efficiently.

SCALABILITY AND FLEXIBILITY

Computer vision technology can be easily scaled to accommodate various attendance scenarios, from small classrooms to large conferences or corporate events. The system is flexible and adaptable to different environments, ensuring consistent and accurate attendance tracking.

BENEFITS



IMPROVED SECURITY AND ACCOUNTABILITY

By associating individuals' identities with their attendance records, computer vision enhances security and accountability. Unauthorized access can be detected, and attendance data becomes a reliable source for verifying attendance.

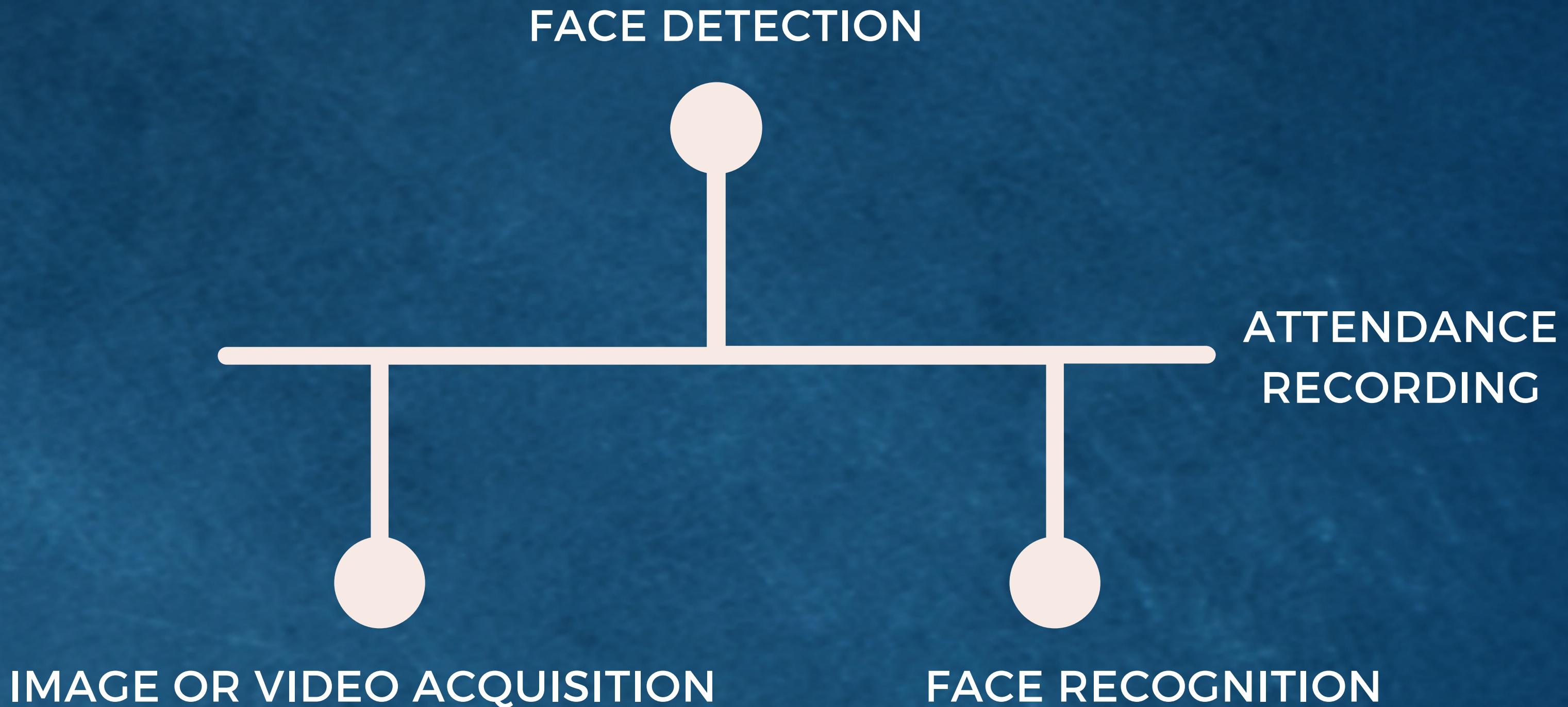
DATA-DRIVEN INSIGHTS

The collected attendance data can be analyzed to identify attendance patterns, trends, or areas for improvement. Data-driven insights can inform decision-making processes related to resource planning and attendance optimization.

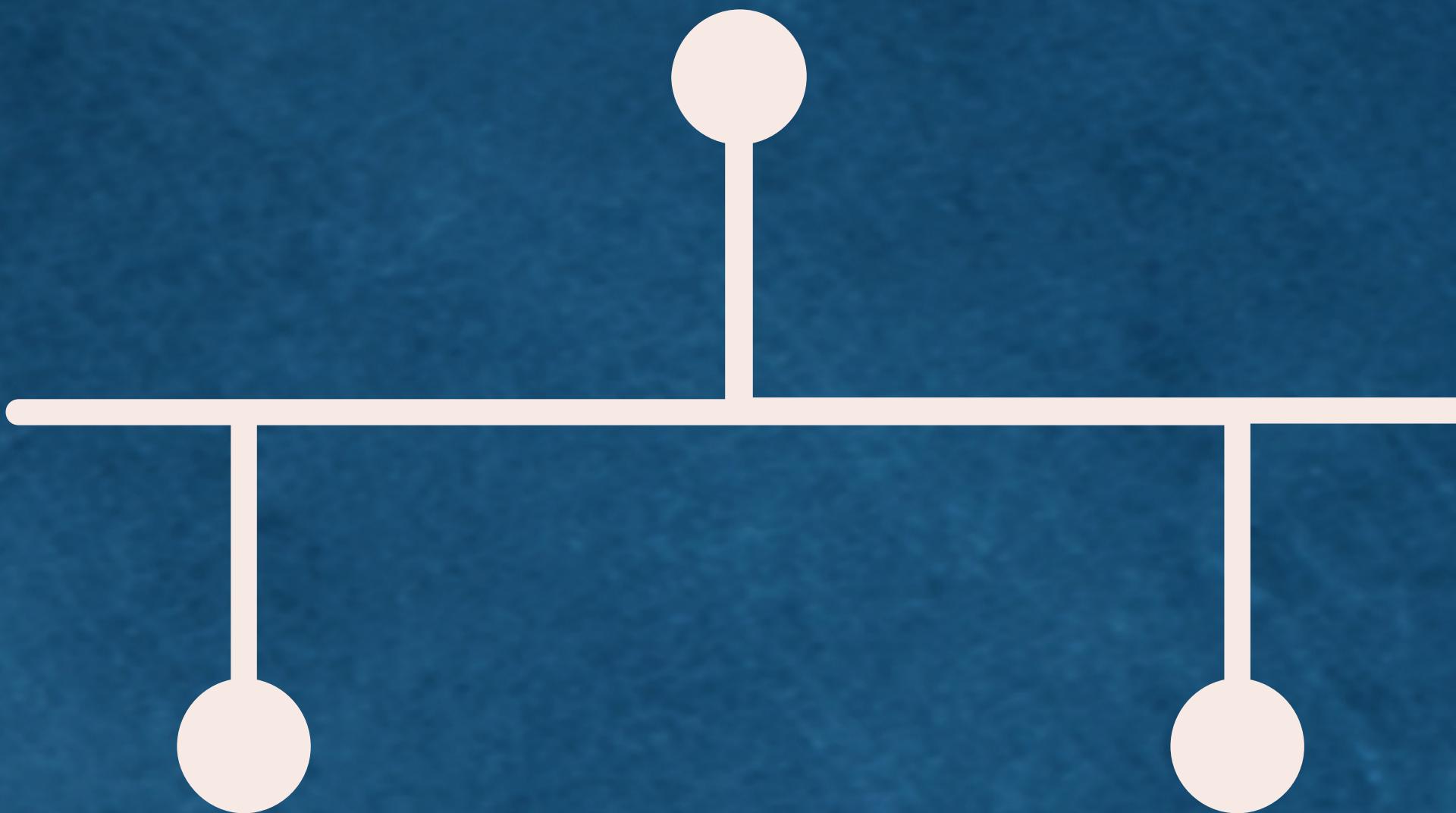
COST- EFFECTIVENESS

Over time, digital attendance systems using computer vision can lead to cost savings by reducing administrative overheads, paper usage, and potential errors associated with manual methods.

WORKING PRINCIPLE



MODULES



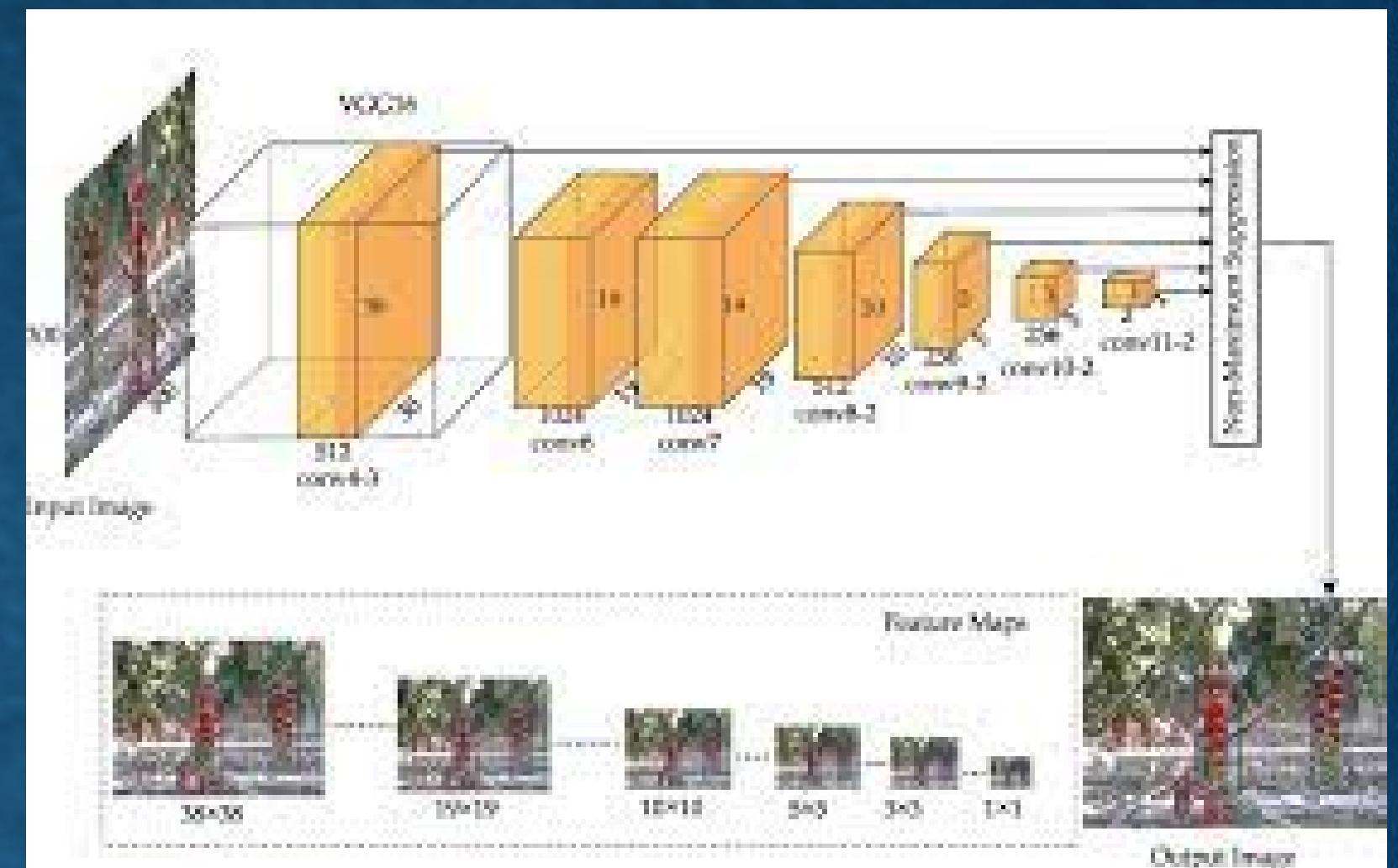
STUDENT ATTENDANCE

STUDENT COUNTING

FACE DETECTION

- RESNET IS A POPULAR OBJECT DETECTION FRAMEWORK THAT COMBINES A DEEP CONVOLUTIONAL NEURAL NETWORK WITH ANCHOR BOXES TO DETECT AND LOCALIZE OBJECTS IN IMAGES.
- THE RESNET ARCHITECTURE CONSISTS OF MULTIPLE CONVOLUTIONAL LAYERS, FOLLOWED BY DETECTION LAYERS THAT PREDICT THE PRESENCE OF OBJECTS AND THEIR BOUNDING BOX COORDINATES AT VARIOUS SCALES AND ASPECT RATIOS.
- THERE ARE SEVERAL COMMON FILTERS AND TECHNIQUES APPLIED TO ENHANCE THE QUALITY AND SUITABILITY OF VIDEO FRAMES FOR FACE DETECTION.

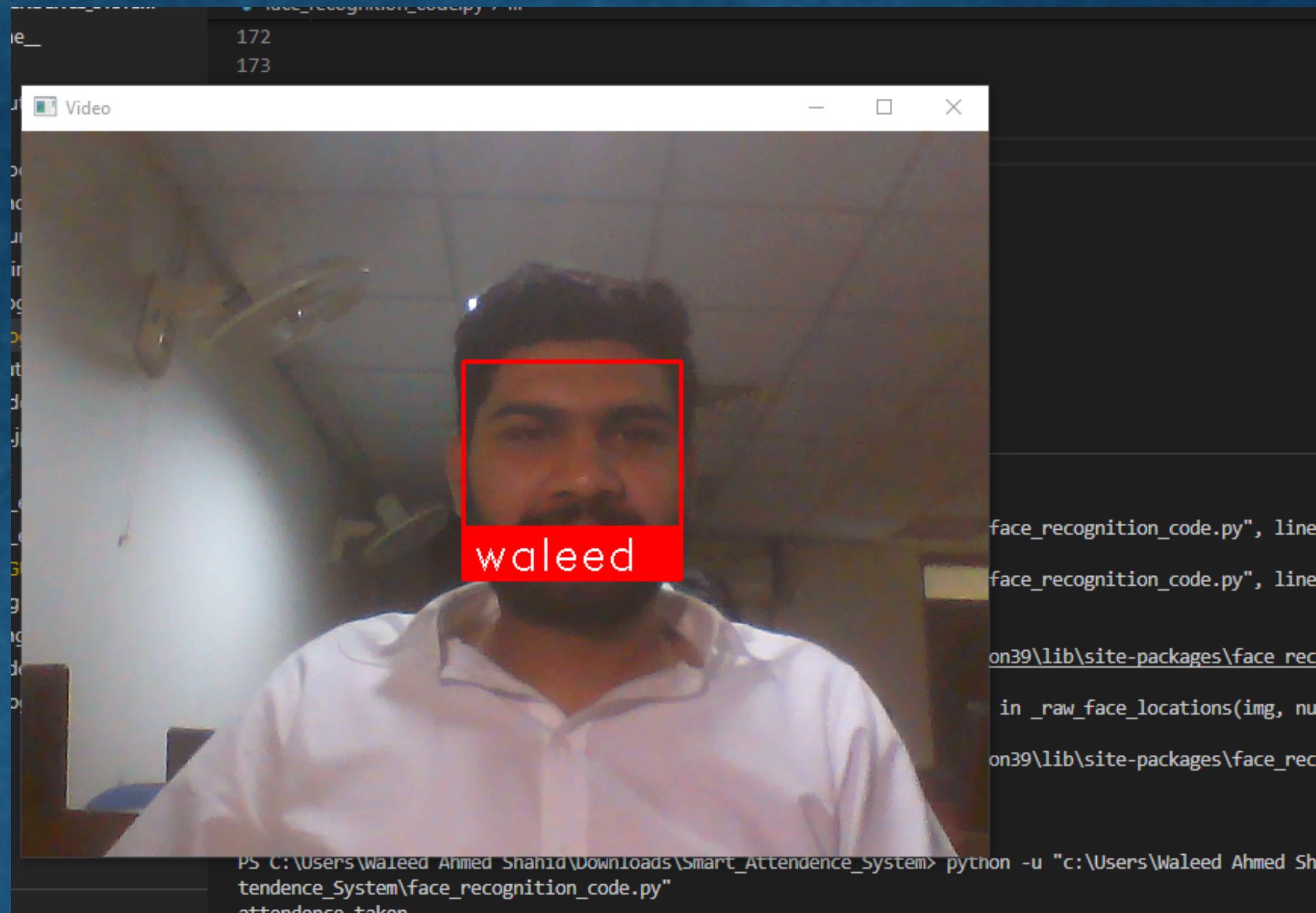
GRAYSCALE CONVERSION, GAUSSIAN BLUR



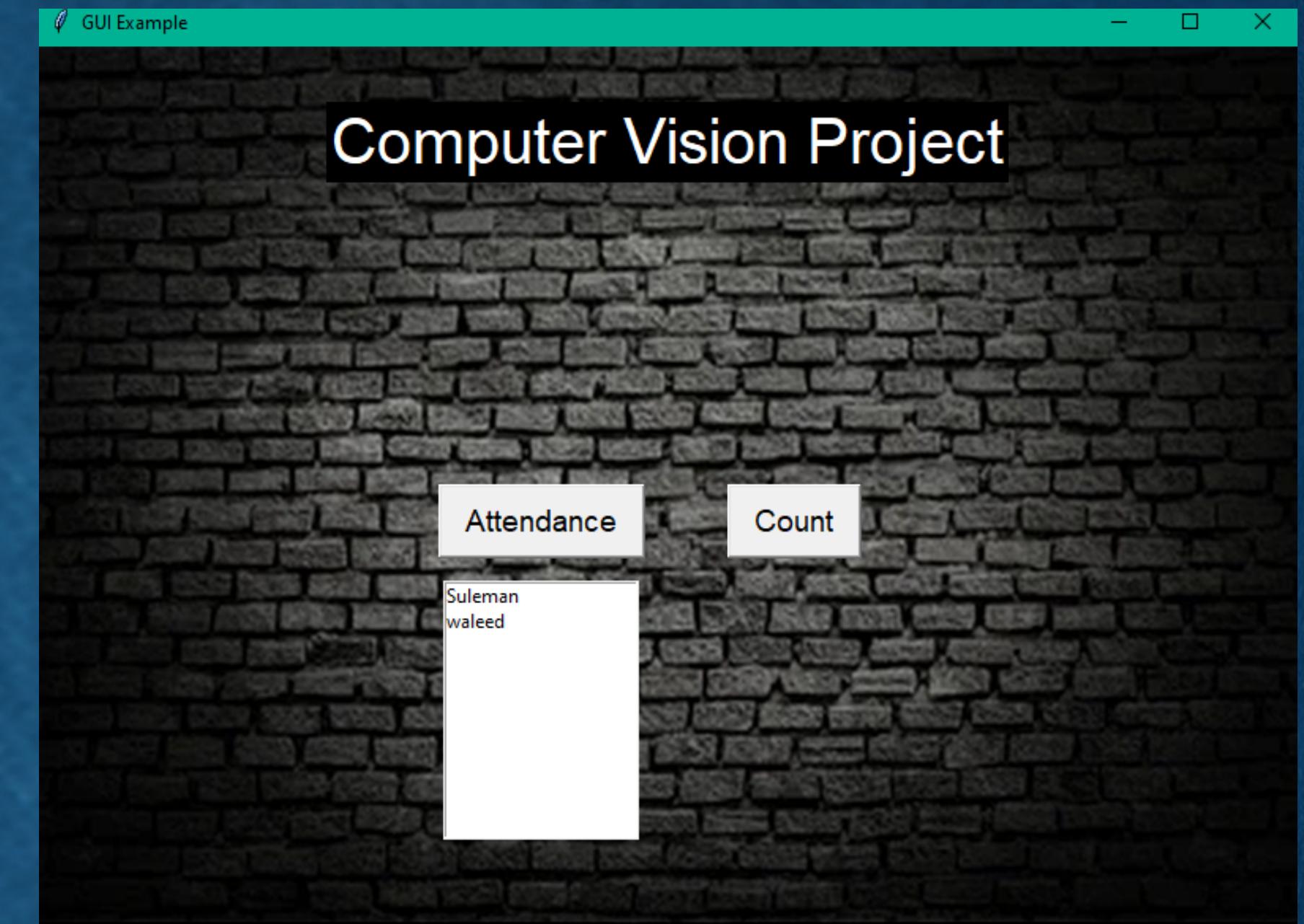
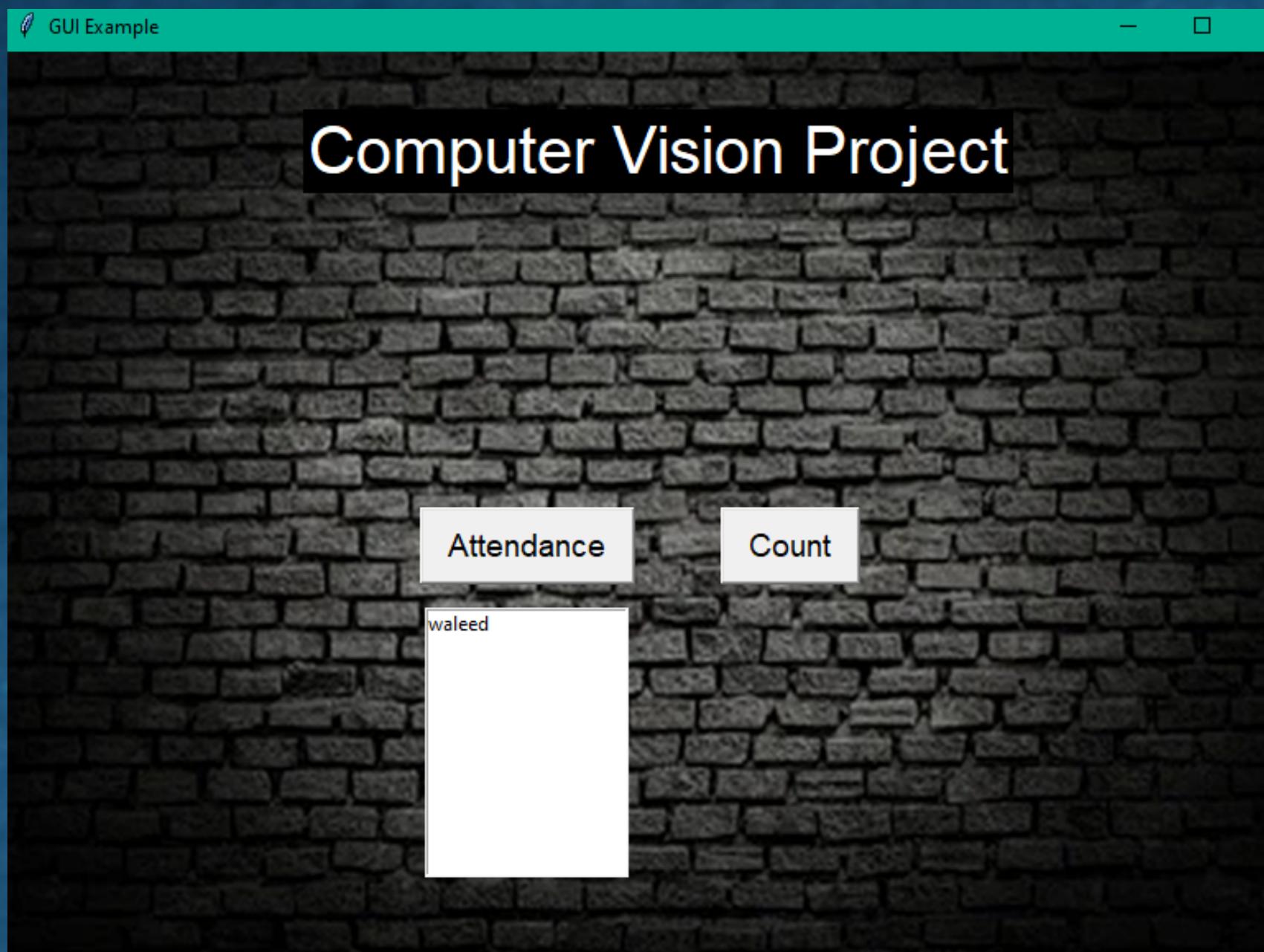
FACE RECOGNITION

- DEEP LEARNING-BASED APPROACH
- EMBEDDING FACES INTO NUMERICAL VECTORS
- MEASURES SIMILARITY BETWEEN VECTORS
- RECOGNIZES KNOWN FACES
- GIVE THE MIN DISTANCE FACE

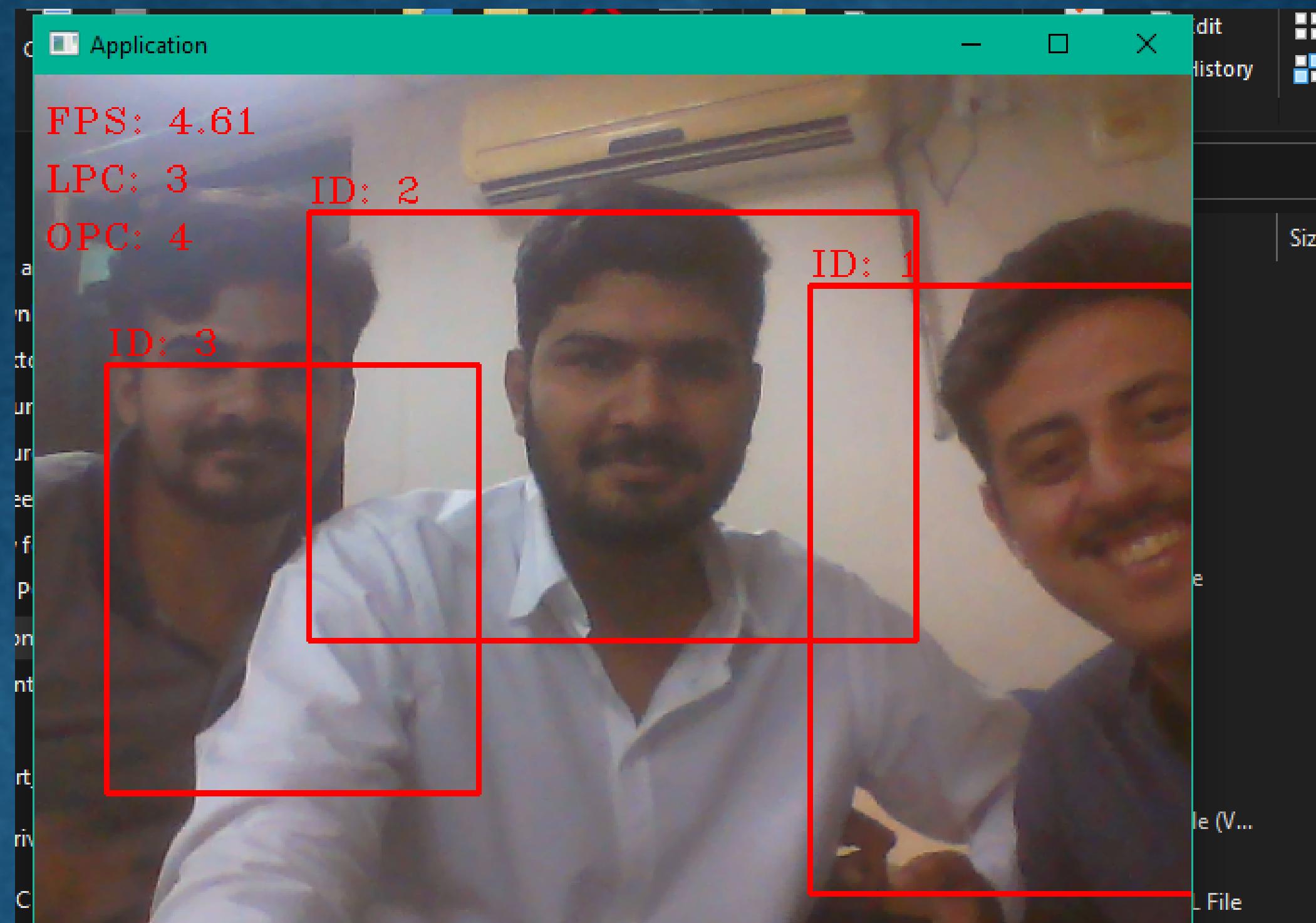
DEMO



DEMO



DEMO



THE TEAM

