# HEART ATTACK EMERGENCY AID USING FACIAL RECOGNITION

**A Mini Project Report Submitted**
**In partial fulfillment of the requirements for the award of the degree of**

## Bachelor of Technology
## in
## Information Technology

**by**

**B SRIKANTH** **21N31A1215**

Under the esteemed guidance of

**Mr. I. Uma Maheswara Rao**
**Associate Professor**


## Department of Information Technology

## Malla Reddy College of Engineering & Technology
**(Autonomous Institution- UGC, Govt. of India)**
(Affiliated to JNTUH, Hyderabad, Approved by AICTE, NBA &NAAC with 'A'Grade)
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**2024-2025**


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## CERTIFICATE

This is to certify that this is the bonafide record of the Mini Project entitled **"Heart Attack Emergency Aid Using Facial Recognition"**, submitted by B Srikanth (21N31A1215) of B.Tech in the partial fulfillment of the requirements for the degree of Bachelor of Technology in Information Technology during the year 2024-2025. The results embodied in this mini project report have not been submitted to any other university or institute for the award of any degree or diploma.

**Internal Guide**

**Mr.I. Uma Maheswara Rao**
**Associate Professor**

**Head of the Department**

**Dr.G. Sharada**
**Professor**

**External Examiner**

# DECLARATION

I hereby declare that the mini project titled **"Heart Attack Emergency Aid Using Facial Recognition"** submitted to Malla Reddy College of Engineering and Technology (UGC Autonomous), affiliated to Jawaharlal Nehru Technological University Hyderabad (JNTUH)for the award of the degree of Bachelor of Technology in Information Technology is a result of original work carried-out in this project .It is further declared that the mini project report or any part thereof has not been previously submitted to any University or Institute for the award of degree or diploma.

**B. Srikanth - 21N31A1215**

# ACKNOWLEDGEMENT

I feel honored to place my warm salutation to our college Malla Reddy College of Engineering and Technology (UGC-Autonomous)for giving us an opportunity to do this Project as part of our B.Tech Program. I am ever grateful to our Director Dr. VSK Reddy and Principal Dr.S.Srinivasa Rao who enabled us to have experience in engineering and gain profound technical knowledge.

I express my heartiest thanks to our HOD, Dr. G. Sharada for encouraging us in every aspect of our course and helping us realize our full potential.

I would like to thank our Project Guide Mr.I. Uma Maheswara Rao for his regular guidance, suggestions and constant encouragement. I am extremely grateful to our Project Coordinator Mr.Vazralu for his continuous monitoring and unflinching co-operation throughout project work.

I would like to thank our Class Incharge Mr.Vazralu who in spite of being busy with his academic duties took time to guide and keep us on the correct path.

I would also like to thank all the faculty members and supporting staff of the Department of IT and all other departments who have been helpful directly or indirectly in making our project a success.

I am extremely grateful to my parents for their blessings and prayers for the completion of our project that gave us strength to do our project.

With regards and gratitude

**B. Srikanth - 21N31A1215**

# ABSTRACT

This project aims to develop an innovative emergency aid system utilizing facial recognition technology to detect potential heart attack symptoms in individuals. By analyzing facial expressions and physiological cues, the system seeks to identify distress signals indicative of a heart attack, thereby facilitating timely medical intervention. The system will be trained on a diverse dataset of facial expressions associated with heart attack symptoms to ensure high accuracy and reliability. The anticipated outcome is a user-friendly tool that can be integrated into smart health environments enabling users to submit facial images for risk assessment. If successful, this project has the potential to transform emergency response protocols for heart attacks, improve healthcare delivery's. Facial recognition technology has emerged as a powerful tool in various applications, ranging from security systems to healthcare solutions. As facial recognition technology continues to evolve, these tools play a crucial role in advancing security, user authentication, and real-time monitoring across various sectors.

# TABLE OF CONTENTS

# 1. INTRODUCTION

Heart Attack Emergency Aid using Facial Recognition aims to expedite the delivery of critical medical information and emergency contact details during a cardiac event. By leveraging facial recognition, emergency services can quickly identify individuals, access vital health records, and streamline communication processes, all of which are crucial during a heart attack crisis. It also facilitates the rapid retrieval of pre-existing medical data, such as allergy information or previous cardiac history, allowing for more informed and effective treatment. With this project , we can understand how facial recognition technology can be applied to enhance emergency response for heart attacks, including its potential benefits, implementation strategies, and considerations for integration into existing emergency response frameworks. Through this innovative approach, we aim to improve response times, optimize care delivery, and ultimately save lives in critical moments. Al scans the face and gives the output of the person's emergency details. It helps Doctors to get previous health records of the patient. And also helps the police to get the patient family details so they can inform them. It saves a lot of time and help to speed up the treatment of the patient by easy access of his previous records. Recent advancements in facial recognition technology offer a promising solution to enhance emergency medical response systems, especially for critical conditions like heart attacks. Facial recognition packages vary in complexity, features, and application. When choosing a package, consider factors such as ease of use, accuracy, licensing, and the specific requirements of your project. Whether for personal projects or commercial applications, these tools provide powerful capabilities for integrating facial recognition technology into various systems. It could be particularly beneficial in emergencies where every second counts, allowing staff to quickly notify family members and begin personalized treatment based on the patient's known health data. In conclusion, the project has the potential to revolutionize patient management and emergency response in hospitals.

## 1.1 PROBLEM DEFINITION

- In emergency medical situations, particularly those involving heart attacks, every second counts.
- Rapid identification and response can significantly impact patient outcomes and survival rates.
- Recent advancements in facial recognition technology offer a promising solution to enhance emergency medical response systems, especially for critical conditions like heart attacks.
- Heart Attack Emergency Aid using Facial Recognition aims to expedite the delivery of critical medical information and emergency contact details during a cardiac event.
- By leveraging facial recognition, emergency services can quickly identify individuals, access vital health records, and streamline communication processes, all of which are crucial during a heart attack crisis.
- It also facilitates the rapid retrieval of pre-existing medical data, such as allergy information or previous cardiac history, allowing for more informed and effective treatment.
- With this project , we can understand how facial recognition technology can be applied to enhance emergency response for heart attacks, including its potential benefits, implementation strategies, and considerations for integration into existing emergency response frameworks.
- Through this innovative approach, we aim to improve response times, optimize care delivery, and ultimately save lives in critical moments
- Al scans the face and gives the output of the person's emergency details.
- It helps Doctors to get previous health records of the patient. And also helps the police to get the patient family details so they can inform them.
- It saves a lot of time and help to speed up the treatment of the patient by easy access of his previous records.

## 1.2 EXISTING SYSTEM

- Basically, when a person is effected by an sudden heart attacks, He will be sent to the hospital.
- Doctors will first do tests on him as they don't have any previous health records.
- Police has to collect details of him by his vehicle or from his mobile phone or after he recovers.
- Disadvantages:
- Delay of treatment.
- No information about previous health records.
- Delayed Emergency Response.

## 1.3 PROPOSED SYSTEM

- To solve the above mentioned problems, we came up with a project where it solves all problems and speeds up the process.
- Whenever a person comes across a patient, he scans the face of the patient or captures the patient face and uploads it.
- Doctors uses this technology to get his previous health records to treat lim according to his health issues.
- Police department uses this technology to get his entire details like address and family details.
- The facial recognition software operates by detecting a face and then measuring the various features of face.
- Al-based software can search databases of faces and compare them to one or multiple faces that are detected results typically.
- In an instant, you can get highly accurate results typically. systems deliver 99.5% accuracy rates on public standard data sets.

## 1.4 LITERATURE SURVEY

- The task of face recognition has been actively researched in recent years. Face recognition starts with the detection of face patterns in sometimes cluttered scenes, proceeds by normalizing the face images to account for geometrical and illumination changes, possibly using information about the location and appearance of facial landmarks, identifies the faces using appropriate classification algorithms, and post processes the results using model-based schemes and logistic feedback.

- In spite of the global efforts by healthcare providers to focus on preventive healthcare systems, medical emergencies continue to claim many lives in low income economies due to many reasons, including, but not limited to, insufficiencies of qualified medical personnel, unavailability of appropriate medical equipment, cultural barriers, cost, and unreliable delivery systems. Lack of stable, supportive computer networks makes it impossible for data sharing, and helps to compound the problem. Other contributing factors, as identified by Robertson, et al. (2009), include economic and geopolitical constraints, transportation, and geographic barriers.

- Medical emergencies are usually handled in three phases at point of occurrence, during transportation, and at a health facility. Razum & Kelly (2005), in their works in Zimbabwe, concluded the fate of an emergency patient depends greatly on what happens during the first phase of the treatment. The issues and problems surrounding the insufficiencies of medical. personnel and unavailability of equipment have been amply discussed in Roudsariemail (2005), Conrad & Gallagher (2015); Razzak et al. (2008); Chandran & Lyn (2008); Scott et al. (2008); Kinfu et al. (2009); and Naicker et al. (2009).

- The focus of this paper is on the issues contributing to the unreliability of the emergency healthcare delivery process. Under normal healthcare delivery process, the quality of the services rendered is greatly impacted by the knowledge and/or accessibility of a patient's medical information, Many healthcare delivery Journal for the Advancement of Developing Economies 2016 Volume 5 Issue 1 Page 56 Institute for the Advancement of Developing Economies 2016 accidents have happened, in part, due to the absence or inaccessibility of a patient's medical history, as evidenced in the works by Castrejon,McCollum, Tanriover, & Pincus, (2012; Tsukamoto (2012); and Grif (2011).

# 2. SYSTEM REQUIREMENTS

## 2.1 HARDWARE AND SOFTWARE REQUIREMENTS

### 2.1.1 HARDWARE REQUIREMENTS:

- 8GB RAM.
- Camera.
- Windows 10 or equivalent operating system.

### 2.1.2 SOFTWARE REQUIREMENTS:

- Python IDE
- PyCharm

# 2.2 SOFTWARE REQUIREMENT SPECIFICATION (SRS)

## 2.2.1 Functional Requirements

**User Identification through Facial Recognition**

- System shall capture and analyze facial features to identify the individual.
- System shall verify the identity of the patient against stored facial data.

**Retrieval of Emergency Details**

- System shall access the patient's medical records, including any known cardiac conditions, history of heart disease, allergies, and current medications.
- System shall provide healthcare professionals with patient data relevant to emergency intervention.

**Retrieve Emergency Contacts**

- System shall automatically retrieve emergency contacts when a heart attack event is detected.
- System shall allow responders to view emergency contact details for direct communication if necessary.

**Data Encryption and Privacy Protection**

- All personal data and medical records shall be encrypted during storage and transmission.
- Access to data should be restricted to authorized personnel only.

### 2.2.2 Non-Functional Requirements

**Performance Requirements**

- Facial recognition processing should be completed within 2-3 seconds to ensure prompt response.
- System should handle concurrent requests from multiple responders without delay.

**Reliability Requirements**

- The system should have an uptime of 99.9% to ensure availability in emergencies.
- Regular data backups should be implemented to prevent data loss.

**Usability Requirements**

- User interface should be intuitive for healthcare and emergency responders, with minimal training required.

**Security Requirements**

- The system must comply with data protection standards (e.g., HIPAA, GDPR).

**Portability Requirements**

- The system should be accessible on multiple platforms, including mobile devices, to support field responders.
- Cross-platform compatibility with different medical record system.

# 3. SYSTEM DESIGN

## 3.1 MODULES OF SYSTEM

Generally, Face Recognition is a method of identifying or verifying the identity of an individual by using their face. First when we run our code camera will be turned on and it captures our face and encodes the facial features. If the processed image matches with the existing user images then it will extract the images from the data and displays the data of the patient.

**MODULES USED:**

**1. User Interface Module**
Purpose: Provides a graphical interface for emergency responders and hospital staff.
Components: Uses Tkinter for GUI (as specified) to capture and display relevant patient information.
Features: Options to upload patient facial images, view medical history, and access emergency contacts.

**2. Facial Recognition Module**
Purpose: Identifies individuals based on facial features to retrieve medical records quickly.
Components: Uses OpenCV for image processing, face_recognition library to compare and identify faces.
Features: Facial detection, recognition, and matching with the database.

**3. Data Processing and Analysis Module**
Purpose: Pre-processes and analyzes patient data to assist with rapid diagnosis and treatment.
Components: Libraries like Numpy for data processing, pandas for data handling, and analytical tools.
Features: Filters relevant patient records, identifies critical health indicators, and compiles emergency data.

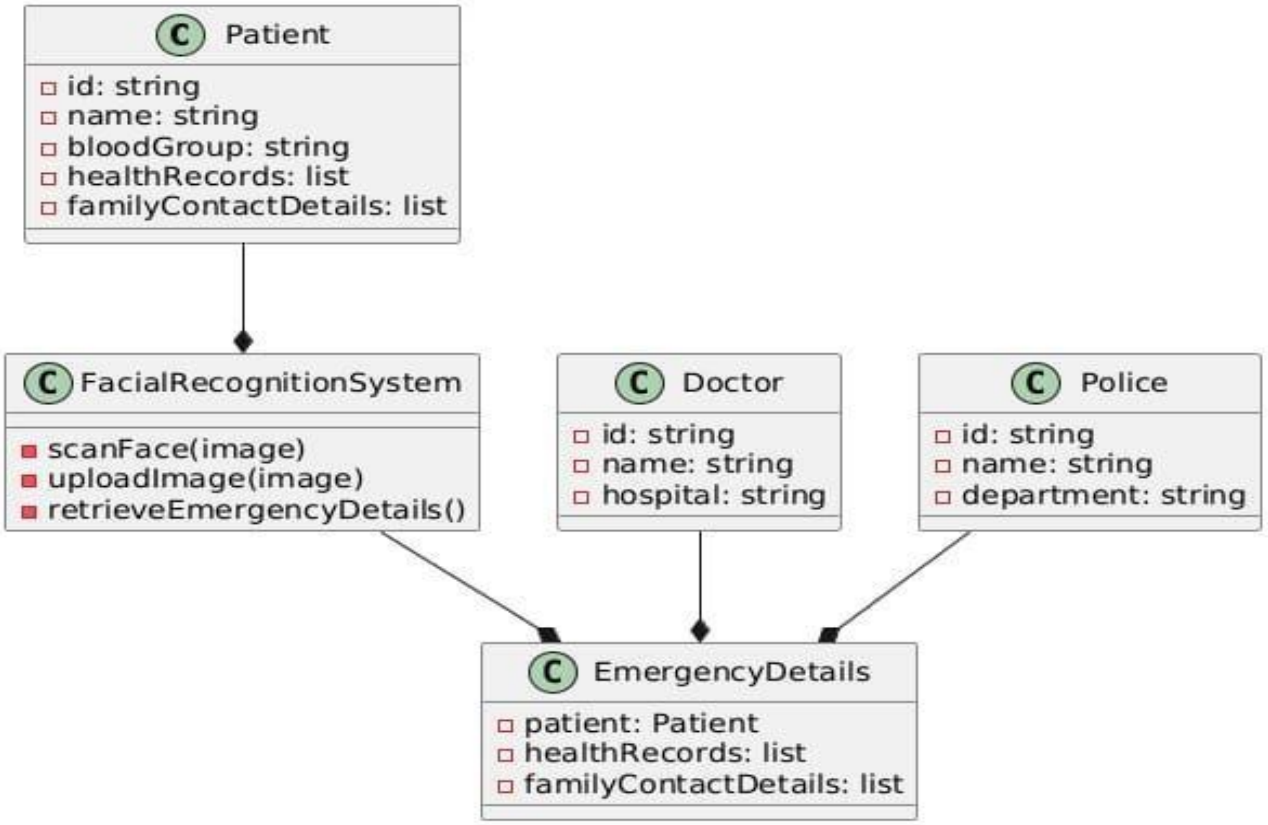
**4. Emergency Contact Module**
Purpose: Provides access to patient emergency contact information.
Components: Interface to retrieve and display contact details.
Features: Automated contact alerts (optional), prioritized access for emergency responders.

**5. Web Integration Module**
Purpose: Connects to web-based services for additional data access.
Components: Uses webbrowser module for browser-based access to patient information, if stored online.
Features: Redirects to online medical records or resources if more detailed information is needed.

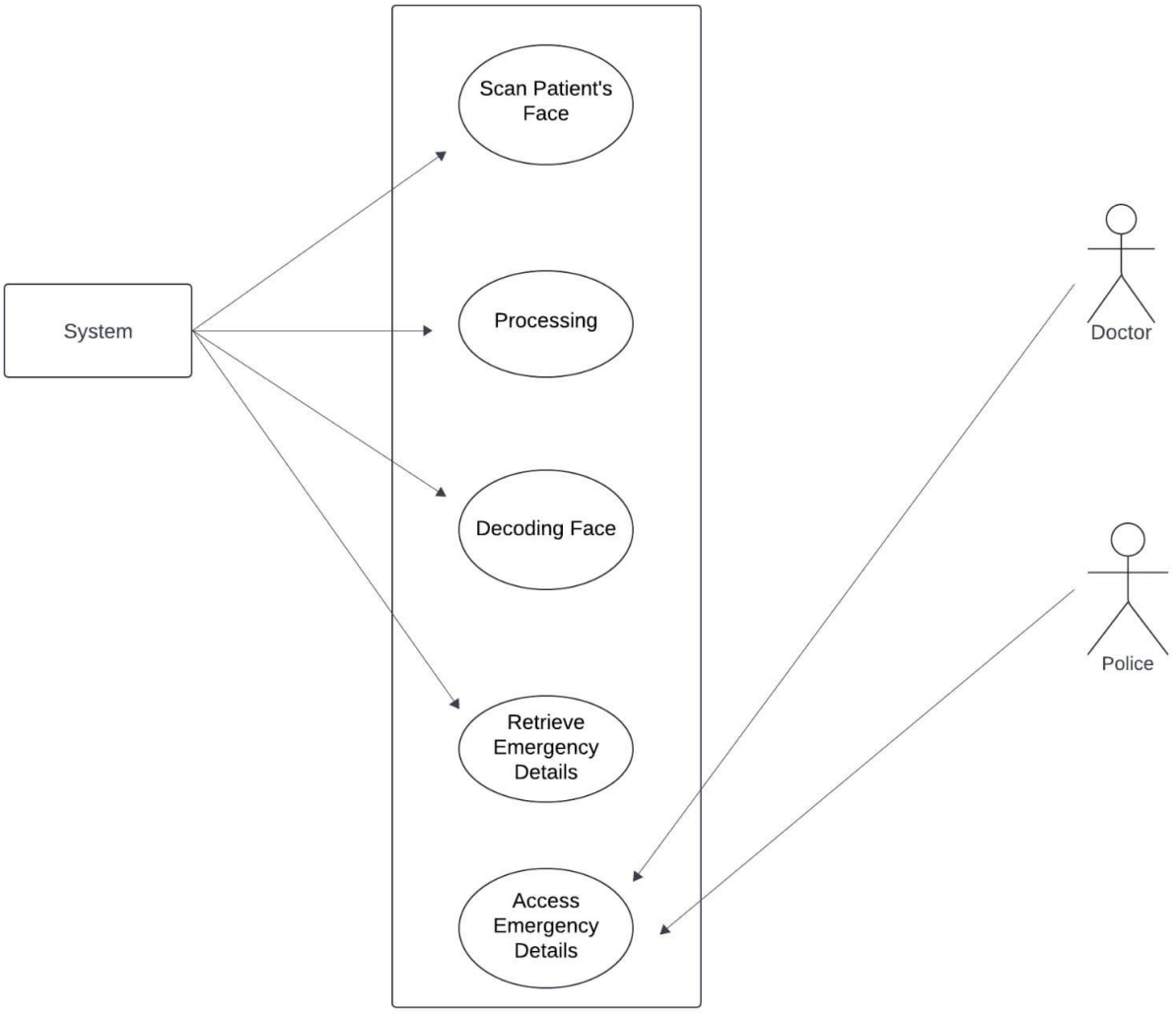
**6. System Security and Authentication Module**
Purpose: Ensures only authorized users can access sensitive patient information.
Components: User login/authentication, encryption for sensitive data.
Features: Access control, data encryption, user authentication logs.

## 3.2 UML DIAGRAMS

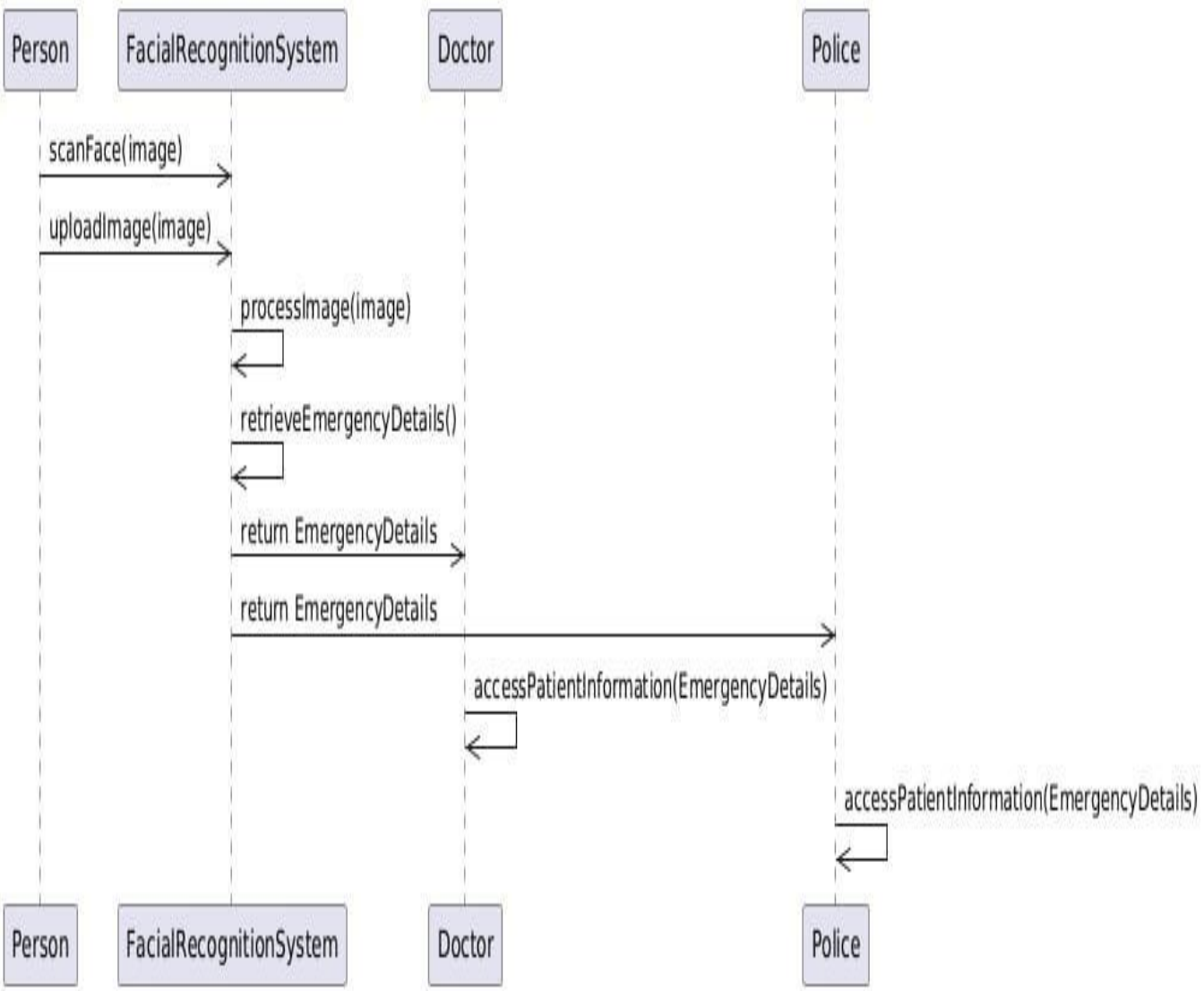
### 3.2.1 CLASS DIAGRAM



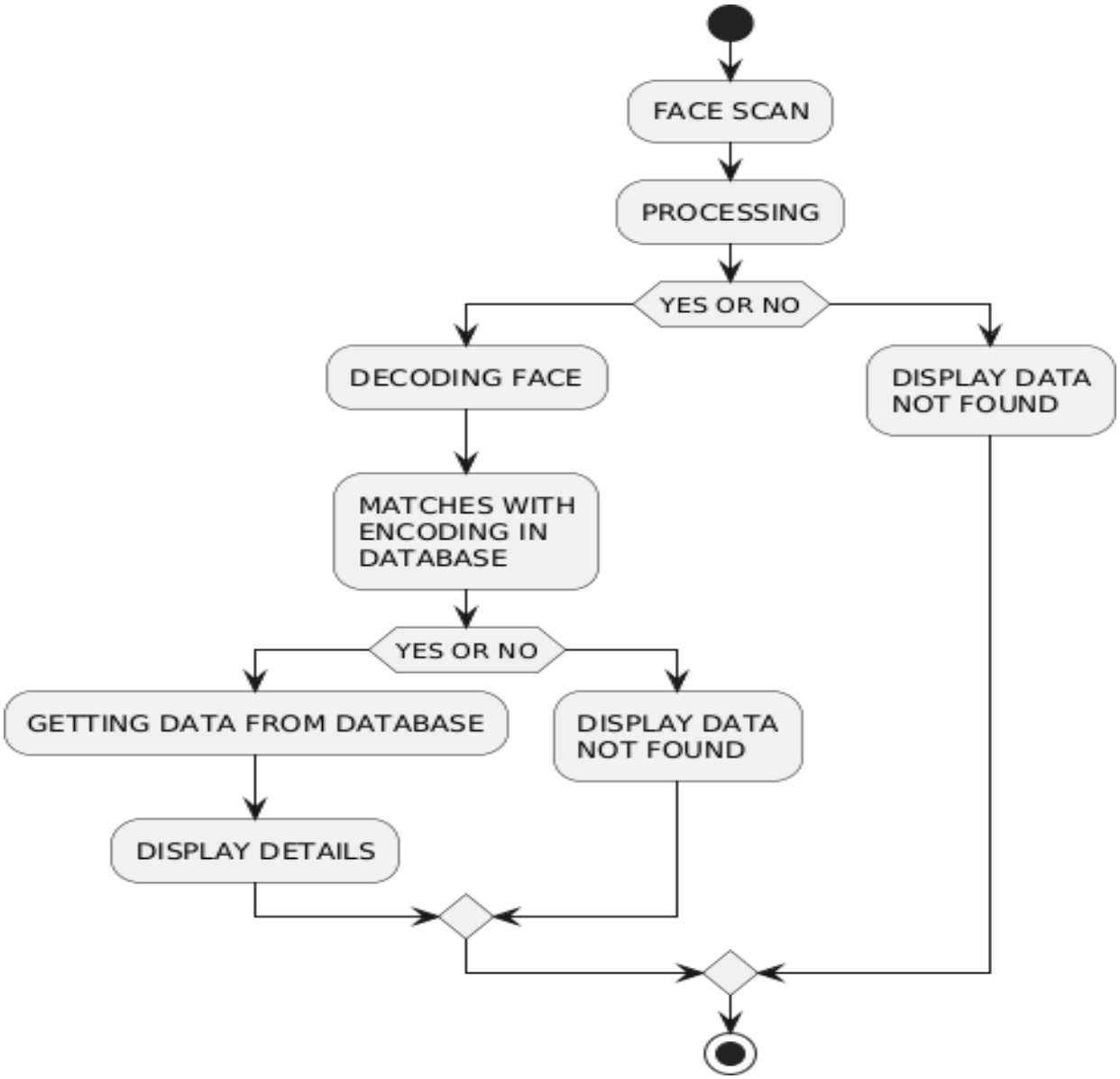
## 3.2.2 USECASE DIAGRAM



### 3.2.3 SEQUENCE DIAGRAM



### 3.2.4 ACTIVITY DIAGRAM



# 4. IMPLEMENTION

## 4.1 SAMPLE CODE

```
import cv2
import mediapipe as mp
import numpy as np
import os
from tkinter import *
import webbrowser

# Suppress warnings by setting an environment variable (if the previous method didn’t work)
import os
os.environ['TF_CPP_MIN_LOG_LEVEL'] = '2'

# Initialize MediaPipe Face Detection
mp_face_detection = mp.solutions.face_detection
mp_drawing = mp.solutions.drawing_utils

# Path to images folder
path = 'Imagebasics'
images = []
classNames = []

# Load images and their labels
myList = os.listdir(path)
print("List of Images:", myList)

for cl in myList:
curImg = cv2.imread(f'{path}/{cl}')
images.append(curImg)
classNames.append(os.path.splitext(cl)[0])

print("Class Names:", classNames)

# Function to find face landmarks
def findLandmarks(image):
with mp_face_detection.FaceDetection(min_detection_confidence=0.5) as face_detection:
results = face_detection.process(cv2.cvtColor(image, cv2.COLOR_BGR2RGB))
landmarks = []
if results.detections:
for detection in results.detections:
bboxC = detection.location_data.relative_bounding_box
h, w, _ = image.shape
bbox = int(bboxC.xmin * w), int(bboxC.ymin * h), int(bboxC.width * w), int(bboxC.height * h)
```

```
landmarks.append(bbox)
return landmarks
# Known image bounding boxes
known_landmarks = [findLandmarks(img)[0] if findLandmarks(img) else None for img in images]

# Set up GUI
root = Tk()
root.geometry("500x200")

# Function to handle face matching
def Facem():
cap = cv2.VideoCap
with mp_face_detection.FaceDetection(min_detection_confidence=0.5) as face_detection:
match_found = False
while cap.isOpened() and not match_found:
success, img = cap.read()
if not success:
break
img_rgb = cv2.cvtColor(img, cv2.COLOR_BGR2RGB)
results = face_detection.process(img_rgb)
if results.detections:
for detection in results.detections:
bboxC = detection.location_data.relative_bounding_box
h, w, _ = img.shape
bbox = (int(bboxC.xmin * w), int(bboxC.ymin * h), int(bboxC.width * w), int(bboxC.height * h))

# Compare with known_landmarks
for i, known_bbox in enumerate(known_landmarks):
if known_bbox:
# Measure difference in bounding box positions and size
bbox_diff = np.linalg.norm(np.array(bbox) - np.array(known_bbox))
if bbox_diff < 80:  # Adjust this threshold for better matching
name = classNames[i].upper()
print("Match found:", name)

if not match_found:
webbrowser.open_new(f'file:///C:/Users/Dell/Desktop/emergency details/project
images/{name}.txt')
match_found = True

# Draw bounding box and label
cv2.rectangle(img, (bbox[0], bbox[1]),
(bbox[0] + bbox[2], bbox[1] + bbox[3]),
(0, 255, 0), 2)
cv2.putText(img, name, (bbox[0], bbox[1] - 10),
cv2.FONT_HERSHEY_SIMPLEX, 0.75, (255, 255, 255), 2)
break
cv2.imshow('Webcam', img)
if cv2.waitKey(10) & 0xFF == ord('q'):
```

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

# Button to initiate face detection
myButton = Button(root, text="Click here to find details", command=Facem)
myButton.pack()

root.mainloop()
```

## 4.2 TEST CASES

**Test Case 1:** Verify if the system can recognize a face from a clear frontal image.
Input: Clear frontal face image of a registered user.
Expected Result : The system should recognize the user and retrieve their information.

**Test Case 2:** Test recognition accuracy with different lighting conditions.
Input: Images taken in low, normal, and bright lighting.
Expected Result : The system should maintain accuracy in normal and slightly low lighting.

**Test Case 3:** Ensure that medical records are retrieved upon successful face recognition.
Input: Recognized face of a registered user.
Expected Result : The user's medical history, allergies, and medication information should display within a few seconds.

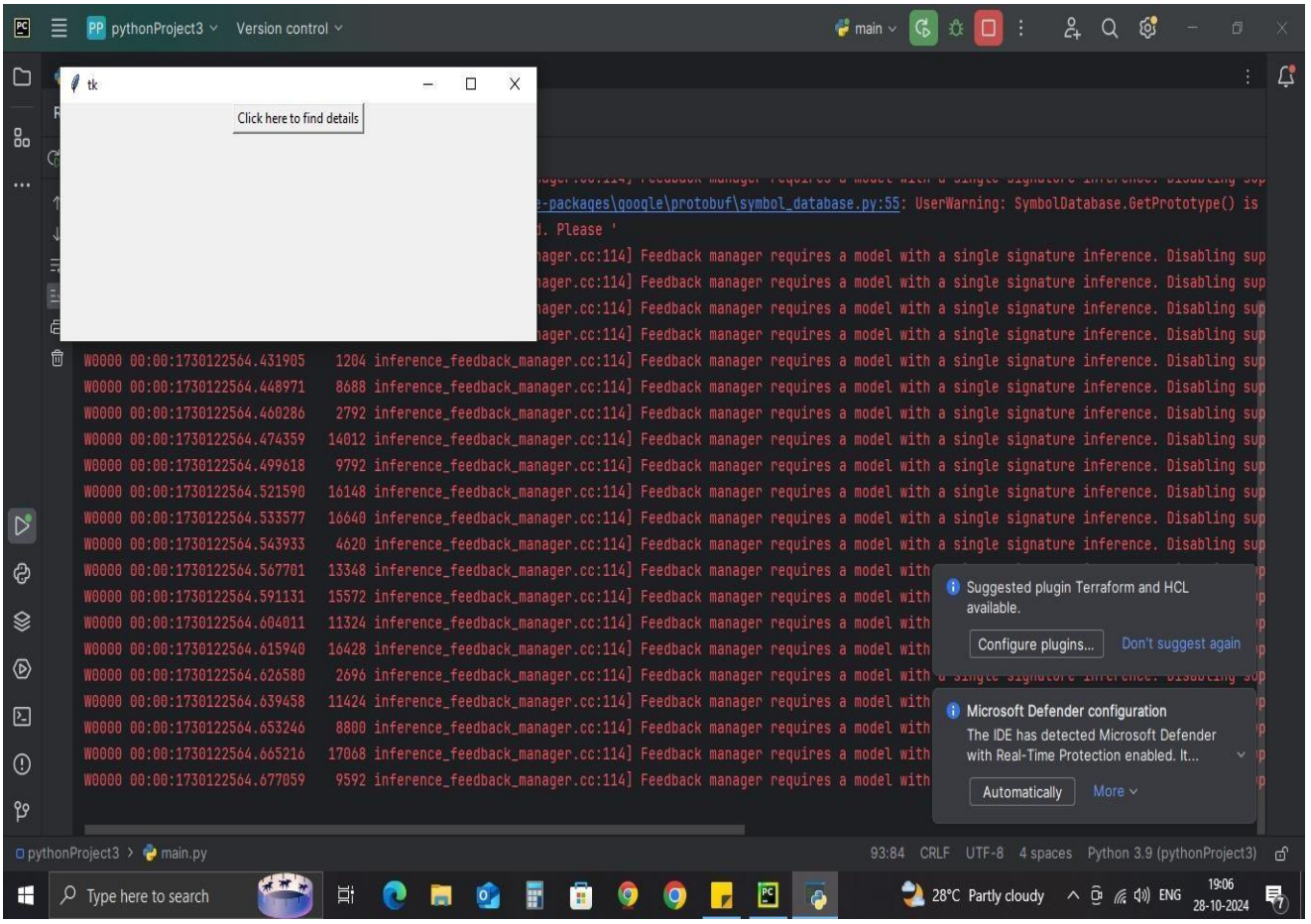
**Test Case 4:** Verify behavior for unregistered users.
Input: Face of an unregistered user.
Expected Result : The system should display a "User not found" message and prompt for manual data entry or registration.

**Test Case 5:** Verify GUI responsiveness for user interaction.
Input: User clicks to scan or upload an image.
Expected Result : The GUI should respond promptly, displaying loading indicators as needed.

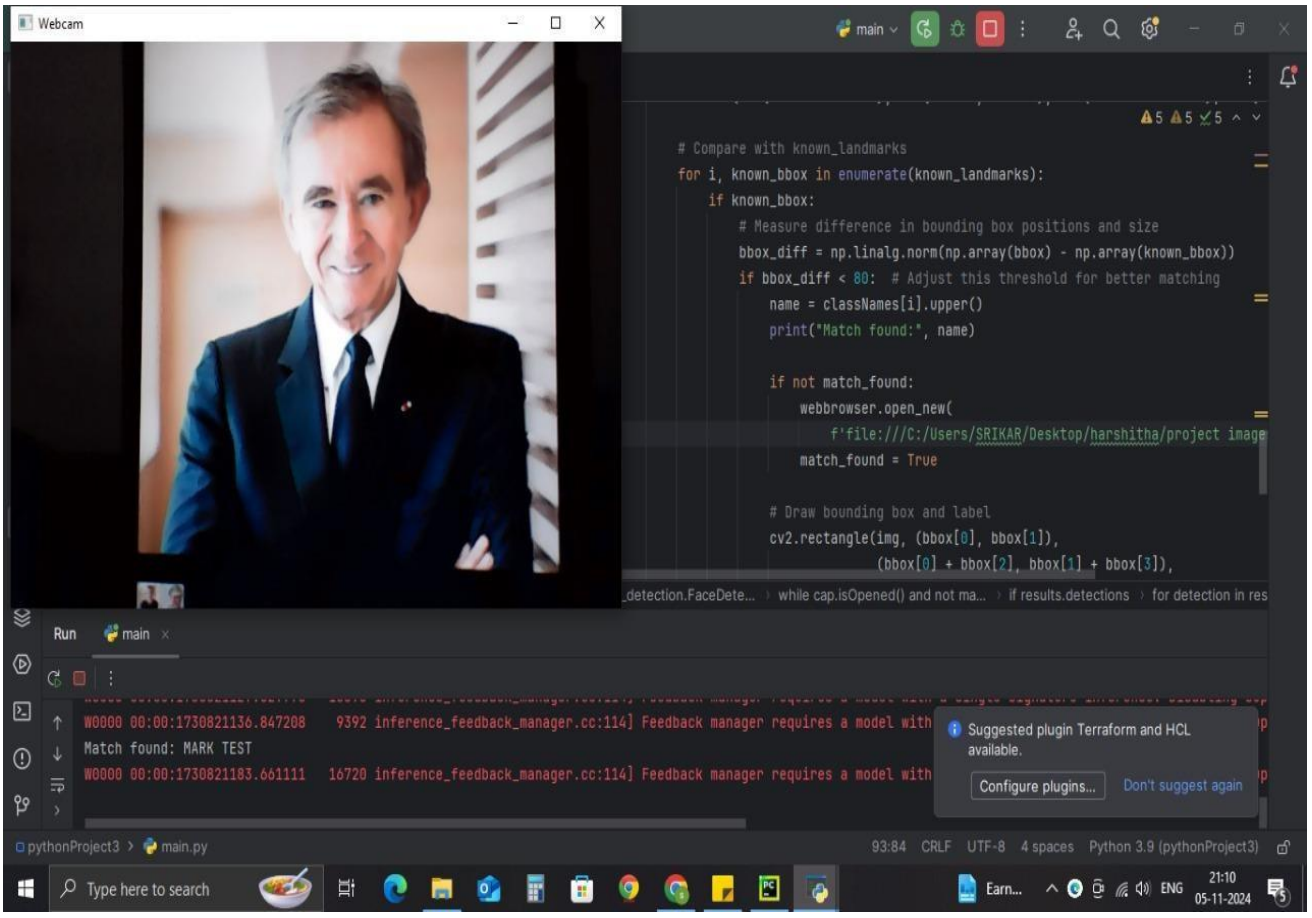
**Test Case 6:** Measure the time taken to recognize a face and retrieve information.
Input: Face of a registered user.
Expected Result : The total time taken should be within 60 seconds.

# 5. RESULTS

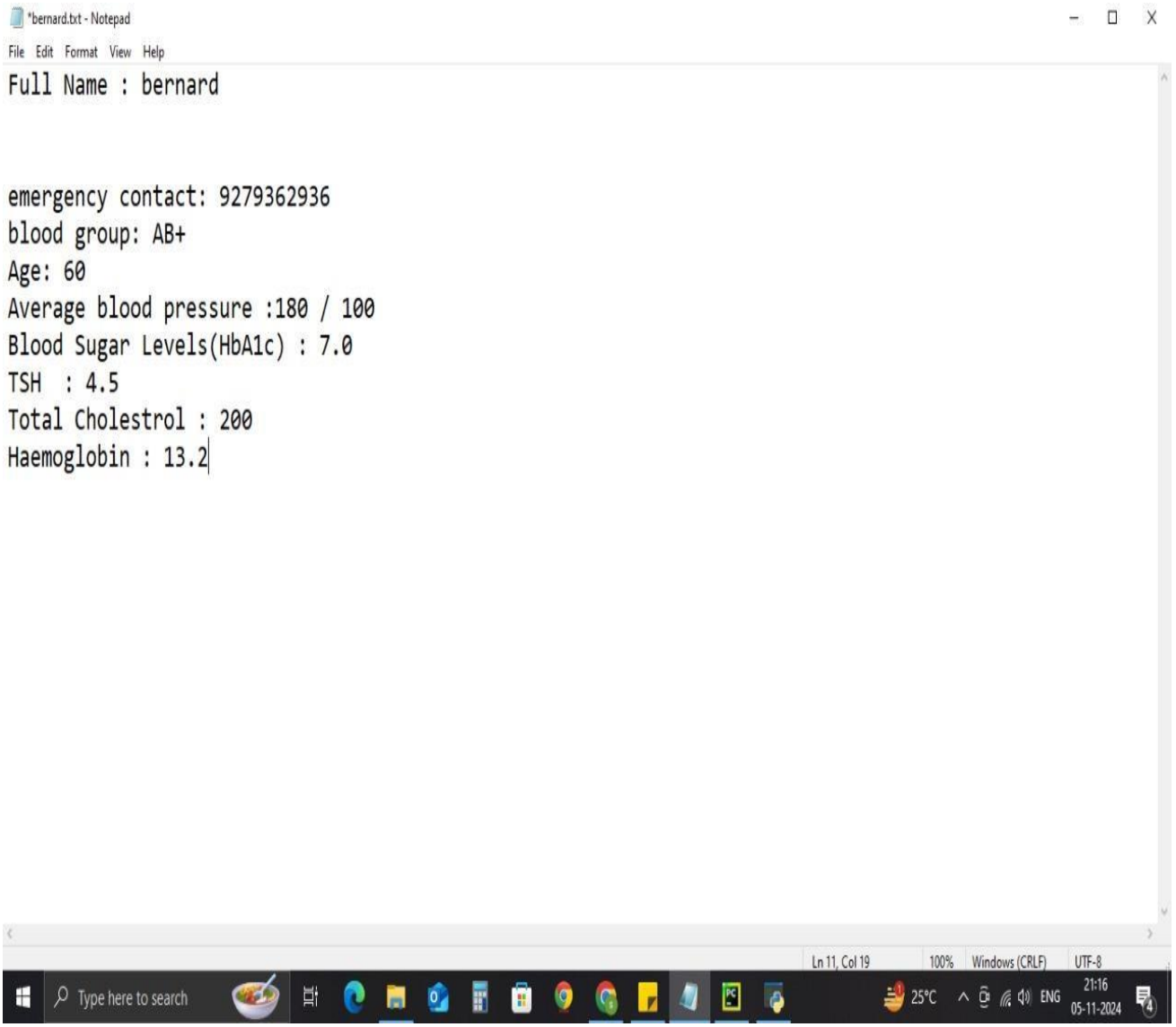
## 5.1 OUTPUT SCREENS




After successfully running of the program an pop up message will appear there a button will be display as : Click here to find details .




After clicking on the button webcam will be opened in order to scan the image of a patient.




Once the face is scanned , if the facial features of the patient matches with the facial features available in the data then there details will be displayed such as : Full Name,Emergency Contact,Age,Blood Group,TSH,Blood Pressure,Total Cholesterol ,Haemoglobin of the person.

# 6. CONCLUSION

- The implementation of facial recognition to access emergency contact details in hospitals offers a significant step forward in improving patient care and response times.

- By simply scanning a patient's face, healthcare providers can instantly retrieve essential
- Information, such as emergency contacts and medical history, which is critical for timely and informed decision-making, especially if the patient is unable to communicate.

- This system could streamline patient admissions, reduce paperwork, and enhance safety by ensuring that accurate and up-to-date emergency information is readily accessible.

- It could be particularly beneficial in emergencies where every second counts, allowing staff to quickly notify family members and begin personalized treatment based on the patient's known health data.

- In conclusion, the project has the potential to revolutionize patient management and emergency response in hospitals.

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