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Retrieval Of Emergency Details Using Face Recognition

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ABSTRACT

Artificial Intelligence is a multi-disciplinary field whose goal is to automate activities that presently require human intelligence. The study aimed to create an enhanced monitoring and management system of patient medical records for hospital clinics to provide easy identification of patients and give easy access to the doctors and nurses regarding patients' medical information. Retrieval of Emergency details using face recognition, is a project which helps the person who is in an emergency. Whenever a person is in critical condition and hospitalized, to start medication, a doctor needs to analyze his past health records. These past health records and emergency details of the affected person can be retrieved by scanning the face. It helps doctors to get previous health records to give medication according to their health condition and it also helps police to get patients' family details, so they can inform them. It saves a lot of time and helps to speed up the treatment of the patient by accessing their past health records easily.

1.INTRODUCTION

Medical emergencies are part of the common daily lives of people in developing and underdeveloped economies. Frequently, some of these medical emergencies end up tragically for many people in these countries due to many reasons, among which is the delivery of medical treatment when the patient is uncommunicative or unresponsive. The ability of the attending medical personnel to access a patient’s medical history is critical for the quality of the treatment rendered. Unfortunately, today many lives are lost in low income economies during medical emergencies due to lack or inaccessibility of a patient’s medical information. One of the major contributing factors of this paucity in records is attributable to the absence of reliable and cost- efficient healthcare delivery systems that support patient identification and verification. 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. When the person met with an accident is brought to the hospital, there are many official formalities before the treatment can start (e.g., admission form to be filled). In some severe cases, these formalities can delay the treatment, which could be fatal to the patient. The automated system which can fill these forms with the help of face recognition could severely cut down the delays. The patient's information

was received from centralized databases of different hospitals that are linked through the internet. "Every injured citizen brought for medical treatment should instantaneously be given medical aid to preserve life and thereafter the procedural criminal law should be allowed to operate in order to avoid negligent death. There is no legal impediment for a medical professional when he is called upon or requested to attend to an injured person needing his medical assistance immediately. The effort to save the person should be the top priority not only of the medical professional but even of the police or any other citizen who happens to be connected with the matter or who happens to notice such an incident or a situation.

2.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 for geometrical and illumination changes, possibly using information about the location and appearance of facial landmarks, identifies the faces using appropriate classification algorithms, and postprocesses 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 lowincome 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 deliveries 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 Castrejón, McCollum, Tanriover, & Pincus, (2012; Tsukamoto (2012); and Grif (2011).

This situation is complicated in a medical emergency when a patient is

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uncommunicative or unresponsive, and therefore unable to provide some medical information. What is needed to effectively address this problem is a system that can securely and reliably capture, store, and retrieve a patient's relevant medical information. The reliability depends greatly on how to verify or identify a patient during a medical emergency described earlier. This system is an attempt to design and develop a cost-efficient and reliable system and platform to facilitate the capture, storage, access, and retrieval of patients' critical medical information for medical emergencies. Face detection is a computer technology that determines the location and size of human face in arbitrary (digital) image. The facial features are detected and any other objects like trees, buildings and bodies are ignored from the digital image. It can be regarded as a specific case of object-class detection, where the task is finding the location and sizes of all objects in an image that belong to a given class. Basically, there are two types of approaches to detect facial part in the given image i.e., feature base and image base approach. Feature base approach tries to extract features of the image and match it against the knowledge of the face features. While image base approach tries to get best match between training and testing images.

3. SYSTEM DESIGN

3.1 SYSTEM ARCHITECTURE

Face recognition is a technology that analyzes a person's facial features to confirm identity, grant access to information, and help in diagnosing rare genetic diseases. Facial recognition relies on the bio metric method, which uniquely identifies a person by evaluating stored data of their physical or behavioral traits based on that person's current state. Most facial recognition systems today are 2D scanners that use cameras to record the physical traits of a person's face and plot those features on a grid. The facial points or face prints are written to a database with a unique numerical code tied to the person's identity. Today's advances in facial recognition have now provided 3D facial recognition that uses 3D cameras for creating face prints to capture the depth and contours of the eyes, nose, and mouth. The 3D facial recognition system has been gaining traction as a reliable authentication system, which is unable to be tricked by using another person's face print.

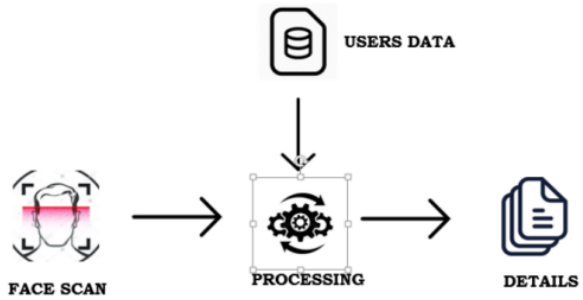

Fig-1: Architecture

One such innovation is the integration of artificial intelligence (AI) within facial recognition systems. Intelligent, AI-based software can instantaneously search databases of faces and compare them to one or multiple faces that are detected in a scene. In an instant, you can get highly accurate results – typically, systems deliver 99.5% accuracy rates on public standard data sets.

The system for retrieving emergency details using facial recognition is intricately designed with several key components. It incorporates a robust facial recognition module, leveraging deep learning algorithms

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to ensure accurate identification under varying conditions. A secure database management system is implemented, prioritizing encryption and compliance with privacy regulations. The comprehensive emergency information database stores crucial details, while user authentication ensures authorized access. Realtime processing facilitates swift responses during emergencies, and the system is designed with redundancy and scalability for reliability. The user interface is intuitive for both administrators and end-users, emphasizing simplicity. Compliance with regulations, stringent security measures, and integration with emergency services round out the system, contributing to its effectiveness in critical situations. Face

Recognition Operations:

The technology system may vary when it comes to facial recognition. Different software applies different methods and means to achieve face recognition.

Face Detection:

To begin with, the camera will detect and recognize a face. The face can be best detected when the person is looking directly at the camera as it makes it easy for facial recognition. With the advancements in the technology, this is improved where the face can be detected with slight variation in their posture of face facing to the camera. Face Analysis: Then the photo of the face is captured and analyzed. Most facial recognition relies on 2D images rather than 3D because it is more convenient to match to the database. Facial recognition software will analyze the distance between your eyes or the shape of your cheekbones. Image to Data Conversion: Now it is converted to a mathematical formula and these facial features become numbers. This numerical code is known a face print. The way every person has a unique fingerprint, in the same way, they have unique face print.

Match Finding:

Then the code is compared against a database of other face prints. This database has photos with identification that can be compared. The technology then identifies a match for your exact

ACTIVITY DIAGRAM

Activity Diagrams in UML serve to visually represent dynamic workflows, showcasing the sequence and conditions of activities within a system or business process. The key components include nodes, representing actions or decisions, and transitions, illustrating the flow between these nodes. Initial and final nodes mark the activity's start and end. Control flows connect actions, specifying the order of execution, while decision nodes enable branching based on conditions. Forks and joins manage parallel flows, and swim lanes partition activities among different entities for clarity. features in the provided database. It returns with the match and attached information such as name and addresses or it depends on the information saved in the database of an individual.

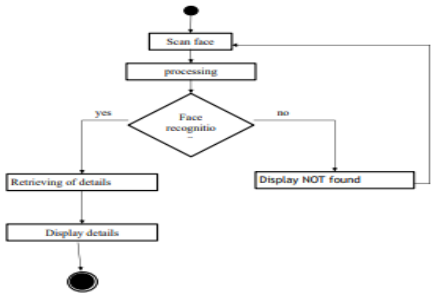

Fig-2: Activity Diagram

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4. OUTPUT SCREENS

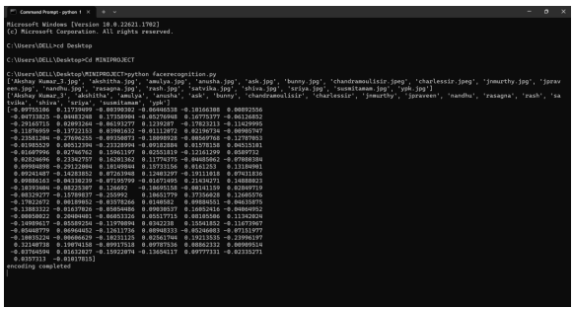

Fig-3:Database

Facial recognition technology for retrieving emergency details operates by analyzing facial features to match against a database of pre-registered individuals. In emergency situations, this system can swiftly identify individuals and retrieve pertinent information such as medical history, allergies, and emergency contacts. This ensures rapid and accurate assistance by providing first responders with crucial details, enabling them to make informed decisions and provide appropriate care. While the technology raises privacy concerns, its potential to enhance emergency response efficiency is noteworthy, emphasizing the delicate balance between technological innovation and ethical considerations in its implementation. When an emergency occurs, the facial recognition system is activated, scanning and comparing the facial features of individuals in real-time against the registered profiles in the database. This instantaneous matching process allows first responders to swiftly identify the person in need and retrieve pertinent details that are crucial for providing timely and appropriate assistance.

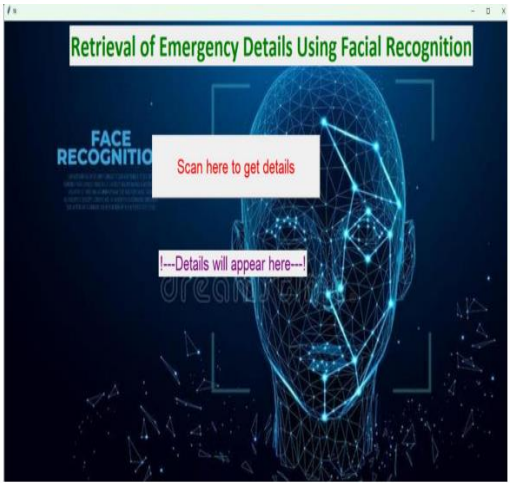

Fig-4 : User Interface for scanning the face

The user interface for the facial recognition system designed to retrieve emergency details begins with a clean and intuitive design. The application opens to a welcoming screen, prompting users to initiate the face-scanning process for emergency identification. A prominent "Scan Face" button captures the user's attention. Upon selecting "Scan Face," the interface activates the device's camera, displaying real-time feedback to guide users in positioning their faces correctly within the frame. A progress indicator informs users of the scanning process, maintaining transparency and user engagement. Once the scan is complete, a clear notification appears, signaling a successful scan. Subsequently, the interface seamlessly transitions to a results screen, displaying the identified individual's profile picture along with essential emergency details. Information such as medical history, allergies, and emergency contacts is presented in well-organized.

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Fig-5 : When a user is registered

Fig-6 :when a user is not registered

When implementing a system for the retrieval of emergency details using facial recognition and user registration, it is paramount to adhere to stringent privacy and security measures. Employ robust encryption protocols to safeguard stored information and enforce strict access controls to limit unauthorized access. Compliance with applicable data protection laws, such as GDPR or HIPAA, is essential to protect user rights and ensure lawful processing of personal information. Transparency in terms of data collection and usage must be maintained, with clear communication to users about how their information will be handled. Consider adopting a multi-factor authentication approach to enhance security. In addition to facial recognition, incorporating another authentication factor, such as a unique PIN or biometric identifier, adds an extra layer of protection against unauthorized access.

In scenarios where a user is not registered for the emergency details retrieval system utilizing facial recognition, it's essential to prioritize privacy, security, and user consent. When a user attempts to access emergency information without prior registration, several key considerations should be taken into account. Firstly, inform users about the necessity of registration for enhanced security and personalized emergency response. Clearly communicate the benefits of registration, such as quicker access to critical information during emergencies. Ensure that the registration process is user-friendly, with transparent explanations of data usage and storage practices. Implement a secure registration mechanism with identity verification to prevent fraudulent attempts. In cases where facial recognition is part of the registration process, assure users that their facial data will be securely stored and processed. Provide clear information about how facial recognition technology works, its limitations, and the measures in place safeguard.

5 . CONCLUSION

This project attempts to address the issue of patient identification during a medical emergency when a patient’s medical information may become inaccessible as a

result of the patient's inability to communicate effectively in order to provide the needed medical information. User data has to be stored to identify a patient based on the patient's facial recognition, to get the details of the patient for carrying different procedures. This system utilizes efficient and effective facial recognition and matching technique to determine whether a given patient already exists in the database, and to retrieve the associated medical information. The ability to quickly identify a patient, even when the patient is unresponsive, enables healthcare providers to access a patient's medical history which is invaluable for quality of care.

6 . FUTURE ENHANCEMENT

- This further can be developed like a real-time application in hospitals by storing each and every person details who has unique identification(aadhar) into the database.And every person should install this application and get registered by providing their personal details, health details etc...So these provided details can be added into the database.
- So the person whoever registered, when prone to accident, the hospital management can utilize this application to scan his/her face and can fetch details to start medication accordingly.
- Face recognition can be combined with other biometric modalities such as fingerprint recognition or iris recognition to create a multi-modal biometric system. Integrating multiple biometric traits can enhance the overall security and accuracy of emergency details retrieval.
- Integrating facial recognition with live video feeds can enable the system to continuously monitor and identify individuals, triggering immediate alerts in emergency situations.

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