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Automated Home Security System using IoT and OTP Verification

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ABSTRACT: The method of Viola Jons, blob Analysis job, was used to allow real-time face detection in the Camera module. The app collects camera video/images of all registered individuals and saves the data in a database. The proposed work is about an artificial framework that uses the CNN (Convolutional Neural Network) algorithm to identify and recognize facial features. The method of Viola Jones work was used to allow real-time body detection in the Camera module. The app collects the camera modules of all registered individuals and saves the data in a database. The proposed project is for an intelligent device that can identify a person's face and remember them. Display the person's name and use the CNN algorithm to identify the body. The procedure was broken down into three stages. First, the footage was captured and converted into pictures. Then, for Body Detection from the Camera module, use blob examination, and finally, for classification, use CNN. Additionally, a fingerprint scanner may be used to check a person's identity.

KEYWORDS: Upload image, OTP Generate, Raspberry- pi

I. INTRODUCTION

The face is a widely used biometric for distinguishing people. Face detection has gotten a lot of attention from security guards due to human behaviors used in a variety of surveillance applications, including forensic, airport, facial recording, and crime analysis, among others. As opposed to other biometric features like thumbprints, fingerprints, palm prints, and so on. They can be taken without the tourist's permission and used for a variety of security-related reasons, including criminal detection, face screening, airport security, and forensic examination, among others. Face recognition involves using a webcam to get a snapshot of someone's face. They took a photograph of the tourist and compared it to the database's records. They are then categorized and stored in the database according to pre-determined classes. Because of the many constraints placed on machine face recognition, such as variations in lighting, head positions, facial expression, occlusion, and aging, face biometrics is a complex field for researchers to study. Researchers suggested several approaches to resolving the issue at hand. Auto facial recognition includes both face extraction and authentication, as well as face detection. The two types of algorithms are geometric feature-based and image template-based face recognition algorithms. Template-based approaches compute similarities between one or more model models and the face to determine the identity of a face. Principal component analysis, kernel approaches, linear differentiate analysis, and other techniques are employed in the development of face models. Ridge lets and other multi-resolution methods are effective in decoding the information content of images and have found uses in pattern recognition, computer vision, and image processing. A fingerprint is a pattern of friction ridges on a person's finger that is exclusive to that individual. Fingerprints are highly accurate, last a lifetime, and are impossible to remove. Thanks to the large variety of variants present, fingerprints have proven to be an excellent method of identification.

II. LITERATURE SURVEY

Yigang Huang, Namgyu Kang, "How Metaphorical Door Handle Influence Users' Opening-Door Behaviors"[1] this analysis aims to determine how a metaphorical door handle influences users' opening-door behaviors and what Kansei benefit a metaphorical door handle provides. To do so, we used a group of 200 students from Future University

Hakodate to fill out a questionnaire with 12 door handles (created in 3D max). According to five assessment objects, each function was rated on a scale of -2 to 2. For an adaptive sample, the data was computed as average scores, then visual knowledge and theory aspect analysis were performed. As a consequence, we can see how a metaphorical door handle can affect users' opening-door habits. A door handle with an apt metaphor phrase, on the other hand, was discovered to be unique and appropriate for use.

Mone Kijima, Yuta Miyagawa, Hayato Oshita, "Multiple Door Opening/Closing Detection System Using Infrasound Sensor"[2]. Our research group is currently researching and developing Internet of Things-based robust emergency and disaster management technologies for communicating tsunami data retrieved from infrasound sensors. In order to measure the sensor's efficacy on a daily basis, it is essential to emit infrared sound. As a result, we took into account the infrasound generated when opening and closing doors in this study, and we used a single sensor to detect the state variations of multiple doors. We developed and tested the detector system for various types of doors.

Jiajun Li1, Jianguo Tao1*, Liang Ding1, Haibo Gao1, Zongquan Deng1, Yu Wu2, "RGBD-based Parameter Extraction for Door Opening Tasks with Human Assists in Nuclear Rescue"[3]. For robotics to perform duties such as home-serving and rescue, they must be able to unlock doors. Obtaining the requisite parameters, such as the width of the door and the length of the handle, is a significant challenge. Because of the complexities of the environment, many researchers use computer vision methods to derive the parameters automatically, which results in fine but not quite consistent results. We suggest a solution that employs an RGBD sensor and a graphical user interface that allows users to "point" at the target area with a mouse to obtain 3D data. Algorithms are being developed to derive essential parameters from the chosen points. We construct a module that can calculate the normal of the plane by pointing at three noncollinear points and then move the robot to the correct orientation to prevent significant internal forces caused by the misalignment of the robot orientation and the normal of the door plane. Experiments were carried out on a live robot. The results demonstrate that the built GUI and algorithms will assist in reliably determining the necessary parameters and preparing the robot for subsequent operations.

Xiangzhong Li1, a Yibing Qu1,b, Shipei Cao2,c, Zheng Liu2,d, Xiangbo Ze1,e, Tao Zou1,f, "Parametric Design of Typical Components of Doors and Windows Based on Open Source Platform"[4]. The interface development tool Qt and the Application Programming Interface were used to carry out secondary development of the open source CAD with the goal of realizing the accurate and rapid modeling of the door and window components, and the programmed algorithm for rapid forming of the door and window components was developed, and the parameterized design of the door and window components was realized. The scheme was verified and compared to the conventional approach by using the frame edge in the door and window member as an example. The findings show that the scheme can produce component models automatically and that the design productivity greatly outperforms conventional approaches, laying a strong basis for the subsequent rapid assembly research of the whole window.

Gui-ru LIU, Ming-zheng ZHOU, Lu-lin WANG, "A Radar-Based Door Open Warning Technology for Vehicle Active Safety"[5] To fix the problem of rear closing goals colliding as a result of drivers and passengers opening doors suddenly, a door open warning (DOW) protocol was implemented. The proposed DOW system is made up of three components: a system, a radar network, and key technologies. A Line Frequency Modulation Continuous Wave (LFMCW) radar sensor was used to detect the approaching targets in the rear of the vehicle. Simultaneously, the CMMA-CFAR (cell maximum and minimum average-CFAR) algorithm was proposed to maintain a higher detection rate by changing the threshold over time in response to the noise level. In order to integrate the DOW architecture, a DSP-based embedded framework was used. The machine was calibrated and validated using a Chery Arrizo7 vehicle. The early average warning ratings for three symbolic closing targets: motorcycles, bikes, and automobiles were up to 98.00 percent, with a 3.50 percent false alarm rate. In a range of daytime and nighttime road conditions, the experimental results show that the proposed DOWS will efficiently detect moving objects that approach the vehicle's behind warning area and give crash warning to both the driver and the passenger.

Amritha Nag, Nikhilendra J N, "IoT based door access control using face recognition"[6]. In recent years, having a stable security framework that can defend our properties while still protecting our privacy has become increasingly critical. To gain access to an environment such as one's home or office, a typical security system requires a person to use a key, identity (ID) card, or password. The current protection scheme, on the other hand, has several flaws in places where it is simply cast and taken. The majority of doors are operated by people who use keys, identification cards, countersigns, or patterns to unlock them. The aim of this paper is to assist users in improving the protection of critical location doors by using face detection and recognition. Picture capture, face detection and recognition, email warning, and automated door access control are among the subsystems in the proposed framework. Enabled by facial recognition OpenCV is

mentioned because it uses Eigen faces and decreases the size of face images without missing essential features, allowing for the storage of facial images for a large number of people in a database. The door lock can also be controlled remotely using the Telegram Android program from anywhere in the world. For security reasons, the picture taken by the Pi camera will be emailed to the designated user.

III. PROPOSED SYSTEM

This paper describes a Matlab-based automated image capturing method that has been proposed. In this research, we experimented with user faces using recognition methods, viola jones, CNN convolution neural networks algorithms, and other techniques. Changes, on the other hand, are supposed to improve the efficiency classification. This computer recognizes the user's face and automatically recognizes the user's face. This device was made by taking real-time recordings of people's faces. In order to identify the user, the identified faces are compared to the dataset's reference faces. Additionally, the user's fingerprint can be identified for enhanced monitoring.

3.1 PROBLEM DEFINITION
Intensity, lighting, posture, difficulty in managing, and broad occlusion are the key issues with face recognition.
Face detection and fingerprint recognition can help to increase protection.
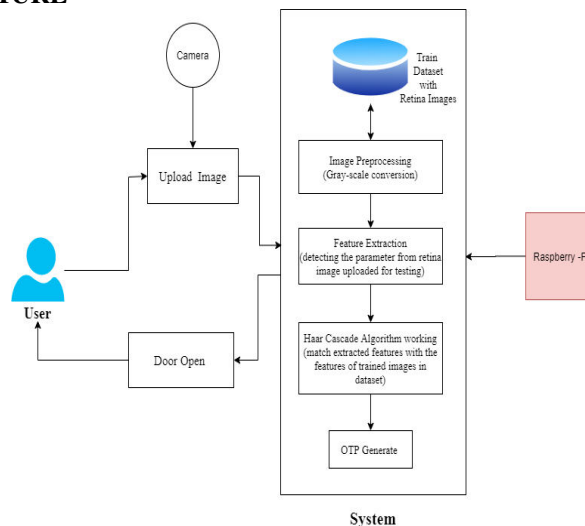
3.2. SYSTEM ARCHITECTURE

Fig. System Architecture

IV. FUTURE WORK

Despite intensive development efforts in this field, which have resulted in mature face recognition systems that can operate under restricted conditions, they are still far from meeting the ideal of being able to function adequately in all of the circumstances that applications in the real-world experience.

V. CONCLUSION

The aim of this project is to create a framework for home automation. It saves time and money, which is particularly useful when dealing with a wide number of people. It can be used with security cameras to identify people in high-traffic places like bus stops, theatres, and train stations, where facial recognition systems can be used to determine the victims' identities. Face detection is a difficult issue in computer vision that has gotten a lot of attention in recent years because of its many implementations in various fields.

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