

SECURE HOME AUTOMATION USING RASPBERRY PI BY TELEGRAM APP

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Abstract: In today's generation dealing with security vulnerabilities on all sides. So, we must use streamlined technology to address these problems. In this project, we'll be taking pictures of people and comparing them to images from the database that have already been stored. Finding out who enters or leaves the property is the most crucial feature of any home security system. Unique faces can be used to monitor things instead of passwords or pins because they are a person's biometric feature. We want to create a smart door that protects the doorway based on who we are. By employing facial detection and identification, this initiative aims to assist users in enhancing the door security of critical locations. If an unauthorised face is automatically detected, the system will take a picture and send it to the appropriate person by telegram.

Keywords: Facial detection, database, doorway, telegram.

I. INTRODUCTION

In this system, an IR sensor is employed to determine any motion at the front door, which activates the camera and causes it to take the picture and send it to the owner by telegram. If the database contains visitor image information, the door will automatically open otherwise the owner will receive the image of an intruder and can choose whether or not to let admission. Our suggested approach leverages Telegram notification to alert the owner, in contrast to existing notification systems. The benefit of utilising Telegram is that some older citizens do not use Gmail or Twitter because they find those services difficult to use and necessitate the setup of accounts. Since Telegram is a messaging programme that can operate online in a similar way to WhatsApp, the majority of elderly folks want to use it. The primary goal of this study proposal is to develop and

deploy a low-cost, secure, and adaptable home automation system that is capable of security employing face detection and motion detection systems that are also used for home automation.

II. LITERATURE REVIEW

Dashi, Deep and Rai et al [1] Technology alters people's daily routines, An android app is created to assist old individuals who are unable to aid themselves, and this created system is used by people who live alone. This system's implementation makes use of WIFI and an easy-to-use web server, both of which have the potential for future growth when combined with improved sensors to boost sensor precision (like up to street Nights)

Dhiraj and Ramana et al [2] Users can access household equipment at any time by connecting to the network and controlling them as necessary. This system also offers security as it sends an email notice to the user when it detects an intruder or person.

The system is operated via a web page and a telegram bot.

Bhavyasri, Neha, Pranaya and Manoj et al [3] Home automation system that combines many technologies, such as the Internet of Things. The primary benefit of this system is that it offers users both text and voice communication options. A chatbot application will be used for the user's text input, and a voice assistant will be used for the user's voice input.

Kamal, Biswas and Sayidul et al [4] Three levels of security have been guaranteed. Use of NFC tags with a PIR motion sensor and a password. The door won't open if one of them isn't there. A lock is attached to the shaft of the servomotor that will be used to unlock the door. When the incorrect password is entered, the LCD shows error text.

Sudha and Priya et al [5] By managing and interacting with remote control of home appliances, the IOT offers a comfortable way of living to people. Two Node MCUs are present in the proposed system. The Node MCU (Node micro controller unit) is an open-source device that combines hardware and software to create a far less expensive system based on the ESP8266 chip.

Apeksha and Bhacheh et al [6] While an automated home can be referred to or classified as a smart home, a wireless home automation system employing the internet of things employs computers or mobile devices to operate features automatically through the internet from anywhere in the globe.

Ruhi et al [7] These systems often include a detecting and actuation layer made up of passive infrared sensors, also referred to as motion sensors, and web cameras for security.

Akash and Priyanka et al [8] In this system, devices including lighting, fans, and camera access are employed. Any internet-capable device, such as a smart phone or laptop, may be used to control home appliances thanks to an Android application and a Telegram bot. Additionally, the proposed

system offers home security by using a camera that can send photos via a Telegram bot message when no one is home.

Mohan, Samir, Nihar et al [9] To serve as a connectivity module to show the system's effectiveness and viability. It enables the user to remotely manage a variety of appliances, including lights, fans, and televisions, as well as make decisions based on sensor feedback on various environmental factors.

G. joga and Vinod et al [10] The study is primarily focused on IOT-based home automation utilising a wireless raspberry PI system. IOT enables us to control basic home appliances automatically via the internet from anywhere in the world using PCs or mobile devices.

Shaik, Krishna et al [11] These days, everything moves at supersonic speeds, and digital media allows for data to be exchanged at the speed of light. Therefore, utilising Internet protocols, information must come in at the same rate.

Desai, Virendra et al [12] The IoT is at its height in the modern world. As the world becomes smarter, home automation is starting to take off. One of the newest technologies in home automation is smart door control. This study seeks to expand the door automation method utilising a Raspberry Pi and an Android device

Shakthi and Abishiek et al [13] A smart home is a networked association of automation and management for extraordinary living. Home security is crucial in this regard, becoming a crucial aspect of our lives.

Reeta R et al [14] The facial recognition technology works by first taking a picture with a camera. The snippet of code recognises an individual's characteristics. Using a Raspberry Pi, the captured image is compared to the database of photos after being detected. The faces are then compared to see if they match or not. After that, if an intruder tries to enter the premises, the SIM300 GSM module transmits a security alert to the designated person.

Akash Kasote , Priyanka Kolage , Nikita Sadgir , Gayatri Avhad, Dr. P.G.Vispute et al [15] Our project aims to create devices that are simple to operate, including home applications and other devices. Using an application on a cell phone with an Android, iOS, or Windows operating system installed, we may operate fans, air conditioners, lights, and other appliances. Yasirli Amri , Mukhammad Andri Setiawan et al [16] Email was the basis on which the smart home was formed. This research examined a home security system that identifies facial patterns to allow access. Cameras and a BeagleBone are used in this system. Email was used by the system to interact with users.

K. H. Shakthi Murugan , P.Abisheik, V.Jawhar Srinath, S.Dinakaran, M.Ajay Kumar et al [17] The database contains pictures of people who have been granted approval. The camera records the face of the person who rings the doorbell when they approach the door and compares it to previously recorded photographs in the database. The door unlocks if the image is a match with the one being captured at the moment. If it fails, the user receives the captured face.

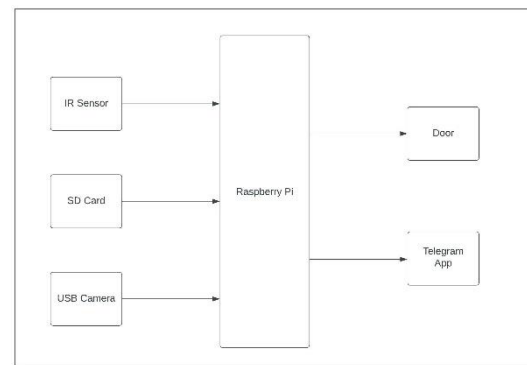
Rajiv Kumar, Pooja Mittal et al [18] The system includes a backup in case there is a power outage issue. The power backup devices are switched in place of the main supply, and they continue to power the security system.

Simge Demir Şevval Şimşek et al [19] The goal of their future study is to create an anonymous secure framework (ASF) for smart homes. The ASF model focuses on session key progression and routine key renewal to get rid of any faults brought on by a compromised key. Although this model offers unlinkability and anonymity, it is missing the property of anonymous identification.

Olutosin Taiwo Absalom E. Ezugwu et al [20] To make efficient use of energy, the mobile application allows you to turn any electrical home device ON or OFF. It analyzes the home's current humidity and

temperature and alerts the user. It also direct conversion readings of the activities taking place at home and stores or gets the data to or from the cloud.

III. BLOCK DIAGRAM



This proposal makes use of a number of other modules, including Telegram and image processing, to improve interaction with home security systems. We require both hardware and software codesign in order to create secure home systems. We require a microcontroller in the hardware to manage the system's general operation. Servo motors and LED actuators are employed.

IV. METHODOLOGY

Hardware requirements, software requirements, and user requirements are necessary for the proposed system's implementation design. The suggested system's control flow is depicted in the

Hardware Components:

- **Raspberry Pi**

The Raspberry Pi Foundation created the single-board computer, or tiny circuit, to enable teaching programming to novices.

- **USB Camera**

A camera that connects to a computer by typically being plugged into a USB port on the

device is known as a USB webcam. The computer receives the video feed, and a software programme allows you to view the images and upload them to the Internet.

- **Sd card**

A Secure Digital (SD) card is a small flash memory card made for high-capacity storage and a variety of portable devices, including GPS navigation systems, cell phones, e-books, PDAs, smartphones, digital cameras, music players, digital video camcorders, and personal computers.

- **Servo Motor(door)**

The control circuit for this type of motor often offers feedback on the motor shaft's present position, enabling the servo motors to rotate very precisely.

- **Buzzer**

a signalling tool that uses electricity and generates a buzzing noise.

- **Jumper wires**

An electric line known as a jumper wire is used to connect distant electric circuits on printed circuit boards.

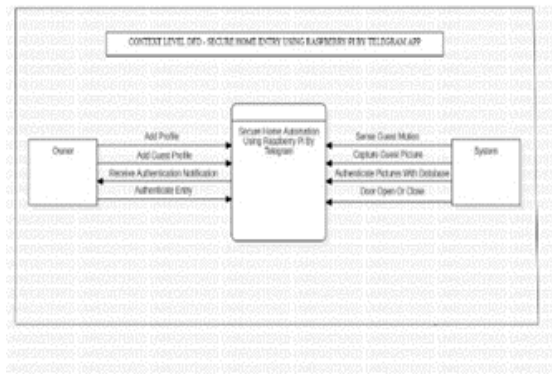
Software Components:

- IDLE Software
- Python language

V. DFD DIAGRAMS

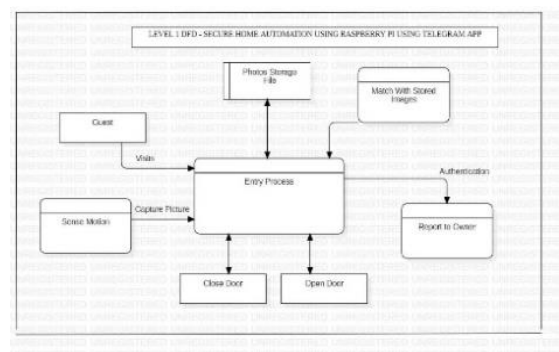
DFD Level 0

It is intended to be an abstraction view that presents the system as a lone process with its connections to outside entities. It depicts the complete system as a single bubble with incoming/outgoing arrows designating input and output data



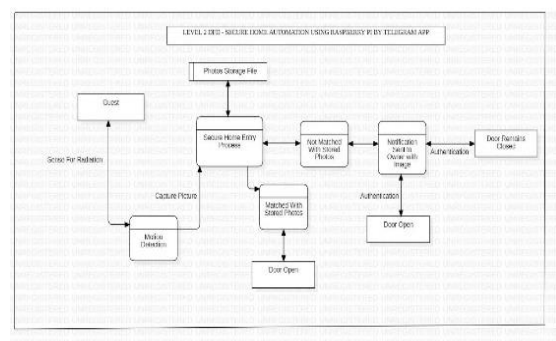
DFD Level 1

The context diagram is divided into numerous processes in 1-level DFD. In this level, we highlight the key operations of the system and decompose the high-level 0-level DFD process into subprocesses.



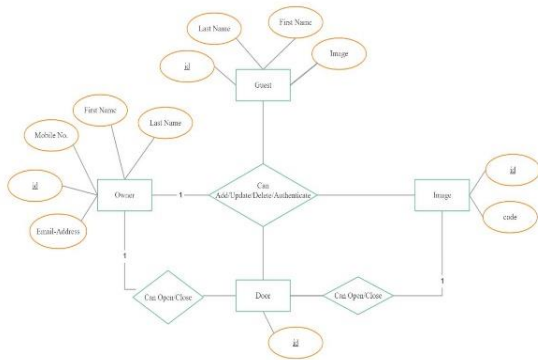
DFD Level 2

Parts of 1-level DFD are further explored in 2-level DFD. It can be used to plan or keep track of the precise or important information about how the system works.



VI. ER DIAGRAM

An ERD is a diagram that shows how the logical structure of databases and the relationships between entity sets recorded in a database are related



VII. FUTURE SCOPE

We have created a smart system that minimises human effort and makes it simple to operate the smart door. This system allows access from anywhere in the world while still offering high security. Both upgrading and portability are simple. By sending a reply message to RPI, the user of the smart door lock system using Telegram can permit entry to a known individual and unlock the door.

VIII. CONCLUSION

The Internet of Things and image processing are two cutting-edge technologies that are used in this idea for a high level of security. The suggested work is implemented utilising a Raspberry Pi, which can connect to a computer or a mobile device, making it simple for the user to utilise. Our technology, which uses an IR sensor for object detection and a camera for face identification, is an integrated response to all previous work.

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