Smart Doorbell Using Raspberry Pi and Pi Camera

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Abstract*: Security is a major concern today and three are many types of surveillance and security systems on the market today. However, they are very expensive and sometimes create problems that we cannot solve, people face many security problems. They did not see anyone coming to the door, since they can't tell if the person is a friend or a stranger, they always have to check every time the alarm goes off. What if someone tries to follow you at your door? How do you know them? Remote home security does more than protect homeowners and their belongings from intruders. The system has a doorbell connected to the Raspberry pi, and whoever rings the doorbell, the camera appears, captures their face and sends an email to the user, and if the user is sure, the door opens. By connecting the smart door to the mobile phone via the mobile phone, the home owner can control the house, send and receive information, turn on the alarm and many more functions. Experimental results how that the proposed system can provide consistent support and service for a safe and secure life*

1.INTRODUCTION

In this days and age, "everything" has its own specialization, which is IoT (Internet of Things). It supports connections to physical devices and allows users to transfer data around the world in a network. Machines play an important role in daily life. Same security. The main purpose of this project is to create a door control system using a smartphone.The system includes many components such as Raspberry Pi model B3 (with built-in Wi-Fi), alarm, camera module, magnetic lock and an email application to receive notifications on Android device. The purpose of the system is when someone came to the door and press the door button, the camera captures the image and sends a still image to the device by e-mail. This product is connected to the Raspberry Pi and Raspberry pi connected to the internet via Wi-Fi. Users can open the door from their mobile phones immediately after receiving the notification. If the person is familiar, the user will open the door and give permission to enter the house.Since technology upgraded products are seen as "more technology, more security", security now plays the most important role. This article provides security to prevent things from being stolen. Securing buildings is now a big issue and new technologies are working to achieve this goal. Wireless network is one of the technologies used to provide remote monitoring and control of home appliances. This article aims to propose a security door system based on Raspberry pi technology that uses a camera to provide an alarm that can alert the owner and identify the guest in the archives.In this case, only authorized persons will be allowed to enter through the door. The system works by taking a photo of the guest by pi camera on the door and sending it to the host. The system proposes can be extended to different objects and locations such as banks and offices. The most important function of any home security system is to detect people entering or leaving the home. Tracking can be done using a unique face instead of a password or pins as they are individual biometrics.These are internal and cannot be easily changed or stolen. Using face detection can increase the level of security. The face recognition security door lock concept is designed to prevent theft in high security areas such as residential areas with low energy consumption, and properties use security at entrances and security doors.

2. LITERATURESURVEY

Raspberry Pi is a low-cost computer that has become quite popular lately. In this article, we show our attempt to create a low-cost device that can be used as a device to connect users using Raspberry Pi. The server installs and broadcasts the match every 5 minutes and the user can view the match using the client application .The main idea of this project is to create and implement a home automation application using Raspberry Pi and python environment. A special sensor is used to detect physical movement and send a signal to the Raspberry Pi if someone is in front of the building. So the camera will take the image of the visitor and then start recording the

video. Photos are saved on the server.The human face has a particular shape that requires complex calculations in order to recognize it. Individuals are distinguished by their faces, with which they are being identified. The face recognition systems are embedded very practical to be used in different applications.Markov Hidden Model used to identify a person's face where the face is divided into parts such as eyes, nose, ears, etc. It always provides a good and correct choice for face detection with a database. Geometric matching is a method based on the geometric shapes of the face. Geometric face correction has enough data for face detection.
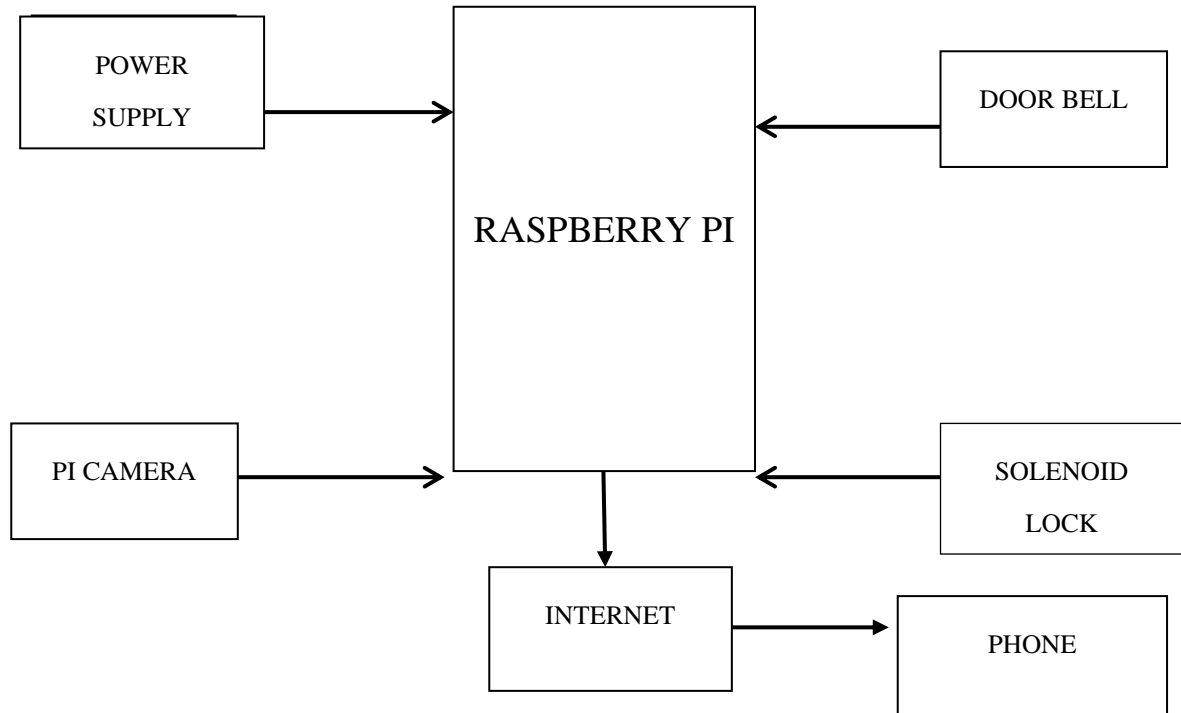
3. PROPOSED METHOD

FIGURE 1. Block Diagram of Smart doorbell using raspberry pi

Whenever a person comes near the doorbell and press the doorbell then this signal is received by the raspberry pi then the signal is passed to the camera. The camera triggers and the image of the person is taken and checks for the person in the database that we already created if the person image already exist then the door lock will be open and if the person image is not exist in the database, then the image of the person that taken is send to user mail.
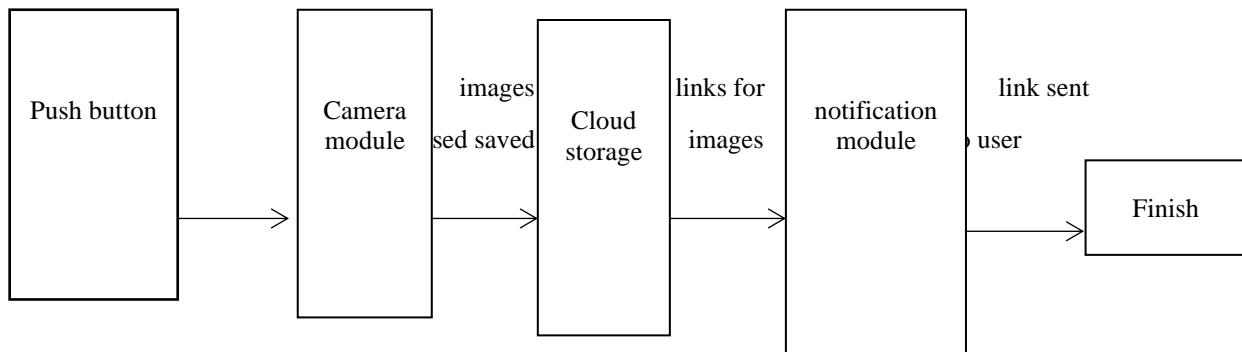

FIGURE 3. Flow Chart

FIGURE 3. Circuit Diagram

4. RESULTS

Whenever a person comes near the doorbell and press the doorbell then this signal is received by the raspberry pi then the signal is passed to the camera. The camera triggers and capture the image of the person and check the person in the database that we already created if the person image already exist then the door lock will be open and if the person image is not exist in the database then the image of the person that taken is send to user mail.
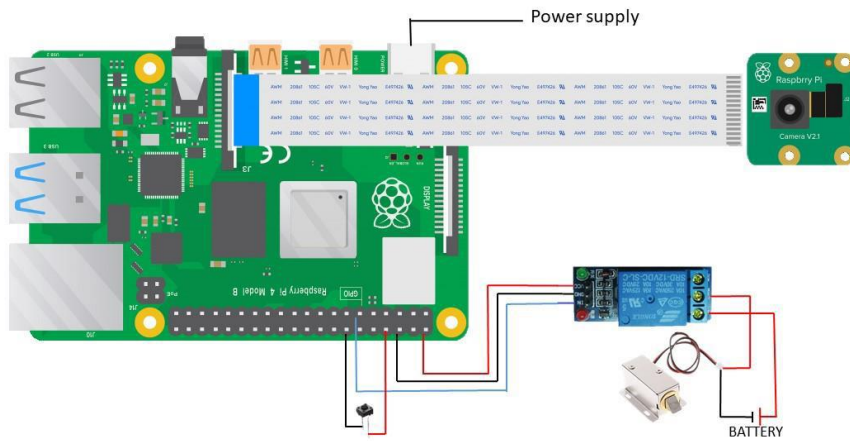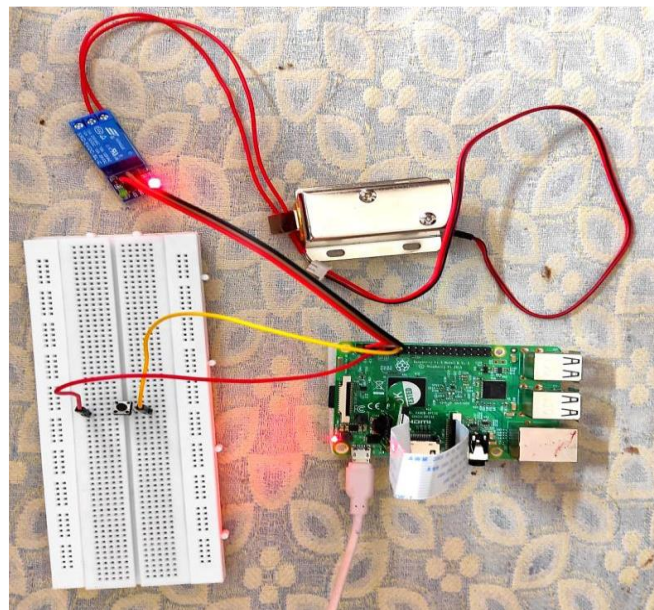

FIGURE 4. Prototype

5. CONCULSION

In conclusion, the smart doorbell using Raspberry Pi offers a host of benefits and features that enhance home security and convenience. By combining the power of Raspberry Pi with advanced sensor technology and internet connectivity, the smart doorbell revolutionizes the traditional doorbell system. The Raspberry Pi's versatility allows for the integration of various components such as a camera, microphone, speaker, and motion sensors into a compact device. The smart doorbell leverages internet connectivity to provide remote access and monitoring. Users can receive real-time notifications on their smartphones or other devices whenever someone rings the doorbell. The smart doorbell using Raspberry Pi combines the power of technology and connectivity to offer

enhanced security, convenience, and peace of mind. The smart doorbell can integrate with existing smart home systems, allowing users to create a cohesive and interconnected home automation network.

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