

Smart Door Using IoT

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Abstract- Advancement in Information and communication technology (ICT) primarily concentrates on Internet of Things (IoT). The emergence of disruptive technologies like IoT has made a major mark in the quality of human by increasing the easiness, comfort and practicality. One of the popular application which falls under the umbrella of IoT is automation of things. Security systems are repeatedly rifled by intelligent thieves this opens a door to provide security to house and elsewhere. Use of eminent technology will provide the security to the greater extent. The proposed work deals with the smart door system controlled and coordinated by android application. Closing and opening of the door is monitored by raspberry pi and its related embedded software. The blend of IoT and android have led to advantages when security is concerned and aims at providing safe, secure and comfortable life by automation.

Index Terms- Information and communication technologies (ICT), Internet of Things (IoT), Raspberry pi, security, smart door access

I. INTRODUCTION

The automation of things is rapidly evolving in this technical era. IoT can be defined as network of devices like physical objects, building, vehicles and other devices. Sensors and system network empowers these gadgets to gather and trade information. The term IoT was coined by Kevin Ashton to explain a system which connects objects in physical world to internet by sensors. The concept of IoT has prominently made automation possible to the greater extent and a major impact on human life, it is the interconnection of various devices embedded in day to day appliances to internet. In order to minimize the human intervention and increase the efficiency the concept of automation are being implemented in every sector right from industries to small offices. Home automation is process of automating appliances at home and converting it into smart house. The home automation deals with remote monitoring and access of automated devices. Today homes are being burgled and are vulnerable to threats like these. So home security has become the area of concern. With the evolution in Information and communication technology, we are able to connect to our home network while we are away with the help of communication technologies like Wi- Fi, Bluetooth, ZigBee etc. The main advantage of home automation is energy conservation and cost savings. Home automation implicitly means a secured door mechanism.

The traditional method of locking and unlocking the door is with the help of the keys. Keys often get lost, duplicated or stolen which opens a way for security threats. Hence there is a need to automate the system by designing smart door which is of low cost and is feasible. The proposed work details about design of smart door with the assistance of IoT and the use of android application in mobile phone to automatically open the door, if the authorized person is detected and the door automatically closes after a certain delay. The system is designed in such a that it is simple and easy to access, pick-proof and can make use of multiple locks.

The further sections of the paper deals with background work carried out and then followed by proposed methodology, conclusions and results.

II. BACKGROUND STUDY

The Domain Name system is a eminent component of internet that helps in finding resources by names which is easy to remember. The naming of resources is based on hierarchical nomenclature and it represents a tree, node at base is called top level domain for example .edu The author of paper [3] speaks about analysis of lexical features of URL's and characters such as IP addresses they concluded that different alphabetic distributions. Ma, etal [4] uses statistical learning methodology based on features such as length of domain names, host names and URL pattern to identify legitimate or DGA domain, while they classify the URL independently the author [5] here speaks about making use of set of alphanumeric characteristics to group the URLs as algorithmically generated or not. Adding to this a comparison is made against the lexical features and results show that alphanumeric distribution gives higher true positive rate. The traditional machine learning approaches for DGA detection on domain name depends on extraction of human engineered and predefined lexical Features [6][7]. Recently there are deep learning methods applied on DGA detection. The author develops a machine learning methods to classify domain names by their network features and methods for resolution of DNS domain name query [11].In [12] the need of legitimate and DGA detection and classification using machine learning algorithms namely random forest, Navie Bayes and SVM and introduces the NGram features to increase the accuracy of classification models.

III. LITERATURESURVEY

The rapid growth in the market of IOT has created an outburst in this field and has provided a lot of solution.

1. The first approach was categorized as a innovative approach for rapid monitoring and control based on finger print door lock, that makes use of IoT in an efficient way by G. Sowjanya et.al.[1]
2. The second paper describes the use of mobile phones to generate hand written words and symbols for identification and implementation of home security system and was successfully by Kuang-Yow Lian et.al. [2]
3. This paper describes the opportunity, status and capability of IOT, by Shanzhi Chen et.al.[3]
4. In order to develop a potential application for office door access control, this paper motivates and shows the importance of IOT. An automated face recognition system was developed in order to accomplish a successful door look security by Ratnawati Ibrahim et.al.[4]
5. Amritha Nag et.al.[5], proposed a system that was built using a high performance processor, Raspberry camera as well as raspberry pi along with open CV. Raspberry Pi was mainly used for implementation of face recognition using python programming language.
6. Digital information such as a secret code, semi-conductors, smart card, and finger prints were used as a method for authentication instead off legacy key system in order to develop a digital door lock system by Yong Tae Park et.al.[6]
7. A combined device was developed by S. Tartamella et.al. [7], that controls room temperature and opens or closes the main entry lock, it also performs simple tasks and answers the client's needs.

IV. SYSTEM REQUIREMENTS

System consists of Raspberry pi 3 model B (fig 1), High torque servo Tower Pro MG995R (fig 2), Push button, jumper wires, wooden plank, screwdriver

RASPBERRY PI 3 MODEL B

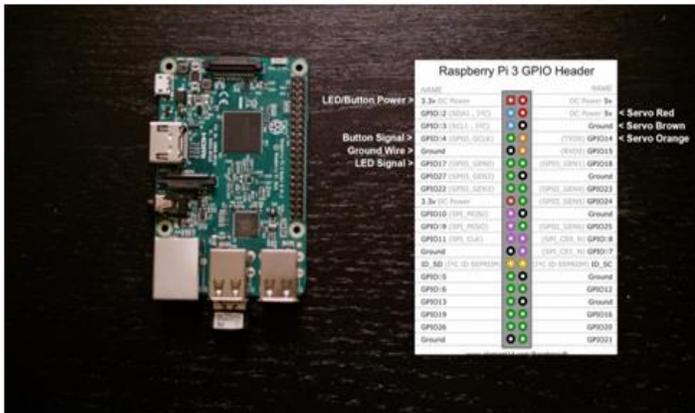


Fig.1: The raspberry pi 3 model B overview

The Raspberry Pi 3 Model B includes a quad-center 64-bit

ARM Cortex A53 timed at 1.2 GHz. This puts the Pi 3 generally half quicker than the Pi 2. Contrasted with the Pi 2, the Slam continues as before – 1GB of LPDDR2-900 SDRAM, and the illustrations abilities, given by the Video Core IV GPU, are equivalent to they ever were. As the spilled FCC docs will let you know, the Pi 3 presently incorporates on-board 802.11n WiFi and Bluetooth 4.0. WiFi, remote consoles, and remote mice currently work out of the container.

High Torque Servo, Tower Pro MG995R



Fig.2: High Torque Servo, Tower Pro MG995R (System Requirement).

In figure 2 the high-torque servo motor is show, specification and features are listed below This High-Torque MG996R Advanced Servo highlights metal equipping bringing about additional high 10kg slowing down torque in a minor bundle. The MG996R is basically an overhauled adaptation of the popular MG995 servo, and highlights updated stun sealing and an upgraded PCB and IC control framework that make it significantly more exact than its antecedent. The outfitting and engine have likewise been moved up to improve dead band with and focusing. The unit comes total with 30cm wire and 3 stick 'S' type female header connector that fitsmost collectors, including Futaba, JR, GWS, Cirrus, Blue Winged creature, Blue Bolt, Crown, Berg, Spektrum and Hitec.

This high-torque standard servo can turn around 120 degrees (60 toward every path). You can utilize any servo code, equipment or library to control these servos, so it's incredible for fledglings who need to make stuff move without structure an engine controller with input and gear box, particularly since it will fit in little places. The MG996R Metal Rigging Servo too accompanies a choice of arms and equipment to get you set up decent and quick!

a. PROPOSED METHODOLOGY

In this task, we tend to demonstrate to you the best approach to frame a reasonable telephone controlled, web associated jolt system battery-fueled by a Raspberry Pi which will be valuable onto your current entryway lock while no alterations

to the entryway. The entryway lock might be constrained by numerous reasonable telephones, and even illuminate you at whatever point someone locks/opens the entryway. The majority of this is finished utilizing a basic, simplified application manufacturer which makes assembling your own Internet of Things (IoT) application simpler than at any other time. For an additional great entryway lock, we will likewise tell you the best way to add a straightforward LED light to show if the entryway is bolted, and a push-catch to work the lock physically. To drive the jolt on the entryway lock, we utilized a high torque, metal apparatus servo. Tower Pro makes a modest one called the MG995R ought to have all that anyone could need control for your specific application. A Raspberry Pi was went to the executives the entryway lock. We utilized a Raspberry Pi three since it's on board neighborhood abilities. In any case, any Raspberry Pi with a WiFi dongle should work with our code. We connected the segments to their individual sticks on the stick out outline. We utilized a little low screwdriver to adjust the dark colored ground wire and red power wire on the servo instrumentation so we tend to might join it on to the Raspberry Pi.

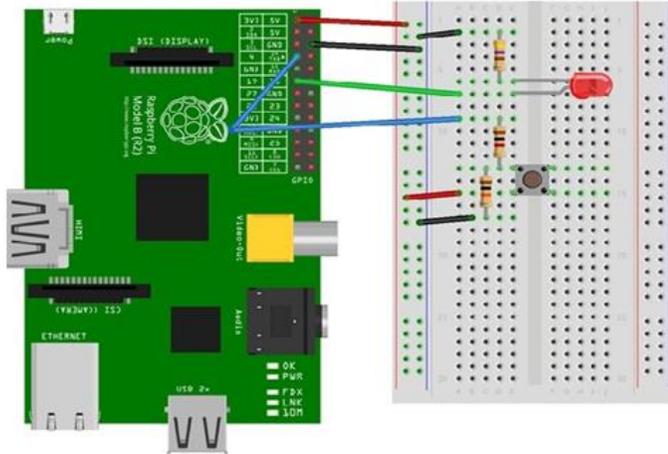


Fig.3: detailed view of system design.

The principle reason of this task is to create security of entryway lock framework where the proprietor of home, condo or building can deal with the entryway lock that actuated naturally and open the entryway that initiated by advanced cell utilizing WiFi innovation. The entryway is naturally lock when the attractive change become shut to one another. The remote system gadget and the micro controller will be place inside the home, condo or building which is put at the entryway. The framework will be overseen through the application in the advanced mobile phone to open the entryway and lock the entryway naturally. This undertaking totally agreeable interfacing because of it is lock consequently and can open the entryway by utilizing advanced mobile phone. Since it is well disposed interfacing, when the client at home, they can utilize the drive catch as opposed to utilizing

the advanced cell. This can facilitate the client. We utilized an IoT application called Blynk for this undertaking. Blynk effectively enables you to interface with a solitary chip board like the Raspberry Pi through their simple to-utilize SDK. Subsequent to downloading the application from the application store, we made another undertaking for a Raspberry Pi with "Association Type"WiFi. We made two parts in the interface. The first was a catch, associated with virtual stick 0, that control the condition of the servo engine. The second was a pop-up messages part to be cautioned when the entryway state changes. At long last, you'll need spare the Blynk verification token by tapping on the apparatus symbol inside the fundamental menu, at that point causation it to your email. This token will be utilized in the subsequent stage.



Fig.4: Result of the Smart Door System.

III. CONCLUSION

Innovation has been progressing at a rushed pace in the present world. In the event that we can utilize innovation to an extreme degree, it will make it our activity more quiet. With the proposed Shrewd Entryway framework, we can screen our homes, shops and so on., from anyplace without trusting on neighbors. Likewise we can make basic barrier move at the underlying if there should arise an occurrence of doubt.

The primary point of this task is to give a security arrangement enabling client to hand-off on specialized answer for the well being.

- It can have an easy to use versatile application to control the locking frame work.
- It is strong and has diverse method of activity.
- It gives a security support.

Be that as it may, there ought to be alignment in the entryway producing which support the electronic and mechanical game

plan of framework. In future work we could likewise include a ceaseless observing framework which could take snaps and furthermore send live video to your cell phone and furthermore utilize some effective component to lessen the expense of assembling making framework promptly accessible for each client.

IV. REFERENCES

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