Intelligent Door Lock System

Shivangi Garg, Prachee Tiwari, Shubham Gupta, Brijesh Prasad, Hritik Mohan

Abstract: The intelligent door lock system supercharged by Amazon net Services. The objective of our project is to enhance security in official and residential places by automation and ease-of-access. A guest once he reaches the door step and press the bell button, greets the visitant by his/her specific identity, apprize the landlord concerning the visitor and associate in nursing keep in mind an unknown visitor. That place landlord will identify the identity of visitor by call on - "Alexa, who is at the door?" and Alexa will obey the instruction given by the owner. We propose to design a custom Alexa skill which helps in identifying the visitors and navigate him/her inside the place or home without moving anywhere. Security is important concern in today's world. In these days' homes are primarily equipped with a minimum of one Virtual help Devices like Alexa, Google Assistant etc. that everybody uses it all the time.

Keywords: Intelligent Door Lock System, Alexa, Security

I. INTRODUCTION

Over the year's smartphone technology has improved exponentially. We have tendency to get ease of access from smartphones thanks to their simple use. We get pleasure from completing all the chores even while not using any android system. We keep in touch with Virtual Assistants like Siri, Cortana for all our chores [1]. We have a tendency to swear fully on the virtual assistants for his or her little to massive tasks, prefer to decision somebody to ascertain the emails or to enquire regarding inversion. And also, in today's era Alexa will not able to do all the work which assign to her.

Using physical keys to lock or unlock the door is the most natural method and everybody is conversant in it. There will solely be one distinctive key for a lock. totally different for various locks you have got physical secret is a well-tested and documented technology, however way and everyone is acquainted with it. different keys. Furthermore, carrying a

Revised Manuscript Received on August 30, 2020.
* Correspondence Author
Shivangi Garg*, Department of Electrical and Electronics Engineering GL Bajaj Institute of Technology & Management Greater Noida, India. E-mail: Shivangigarg42@gmail.com
Prachee Tiwari, Department of Electrical and Electronics Engineering GL Bajaj Institute of Technology & Management Greater Noida, India. E-mail: tiwarippma@gmail.com
Shubham Gupta, Department of Electrical and Electronics Engineering GL Bajaj Institute of Technology & Management Greater Noida, India. E-mail: shubham03011997@gmail.com
Brijesh Prasad, Department of Electrical and Electronics Engineering GL Bajaj Institute of Technology & Management Greater Noida, India. E-mail: brijesh.prasad@glbitm.ac.in
Hiritik Mohan, Department of Electrical and Electronics Engineering GL Bajaj Institute of Technology & Management Greater Noida, India. E-mail: hrx031@gmail.com

house key enlarge the possibilities of keys getting stolen, misplaced or lost [2]. Security of our house from remote location is important. Imagine, a visitor stands at the door step and we are far from our home or busy in some important task. But we want to allow him inside our house.[3]. Just imagine! Alexa can do everything for you!! Our goal is to design secured access control that can replace physical keys for accessing door [4]. The system uses the Virtual Assistant "ALEXA" is there in the house which uses Raspberry Pi, A mini device which does not contain any area and light to work. Any ordinary home can be used just an Alexa which take very less space and installed in our house with devices like speakers, USB, camera, sensors and the wireless connection around the house. It can be used only by different AWS services and integrated different hardware on the door. It takes care of many things around the house and with the good Home police work Alexa System victimization Raspberry PI for the protection purpose of the good Home.

II. LITERATURE REVIEW

Before beginning with the analysis and style of project, we have a tendency to referred several analysis papers, manuals, documents associated with the thought of project. Lia Kamelia, Alfin Noorhassan S.R, Mada Sanjaya and W.S., Edi Mulyana[1] describe the general plane of the way to management home for sensible homes particularly for gate security locks. They use android door lock system for opening and closing the door. The owner of the home used android based lock system for both inlock and out lock system and android phones also provides the security. Hamza Khan [2] in his paper provided detailed information about the system which uses pre-decided password. It makes it impossible for an outsider to unlock the door without the permission of the owner. If the user forgets the password, the owner can renew the keyword. This keyword type system has good security way of opening and closing the system. Arpita Mishra, Siddharth Sharma, Sachin Dubey, S.K.Dubey [3] in their paper came up with a different mechanism where the password needs to be entered manually by the keyboard, it gives the user three attempts to enter the right keyword. When the entered keyword is right the motor revolve the handle of door lock to unlock it. This method is highly secured and cannot be fooled easily. Basma M. Mohammad [4] recommend a model for the smart automation using the advanced wireless automation technologies. The advanced system uses biometric authentication for unlocking the door and makes the authentication process for the owner quite easy. Pavithra.D [5] proposes an application of Iot (internet of things) to control applications like lights, fans, door lock systems and various other electrical equipments by way of Smart-technology where the wireless connection is taken in action as a communication protocol and observe using a webpage.

Retrieval Number: J75240891020/2020©BEIESP
DOI: 10.35940/ijitee.J7524.0891020
Journal Website: www.ijitee.org

329

Published By:
Blue Eyes Intelligence Engineering
and Sciences Publication

Relay hardware circuits is connected through a server through which the patron can explore the different devices. Mohammad Ibrahim [5] comes up with a mode to construct an sustainable and eco-friendly environmental using device raspberry pi to monitor the system.

Robert R [7] in his paper gives a different idea to execute IOT in the advance area abstraction using a system of sensors and non-wired nodes and for storage and processing on the cloud server.

III. WORKING
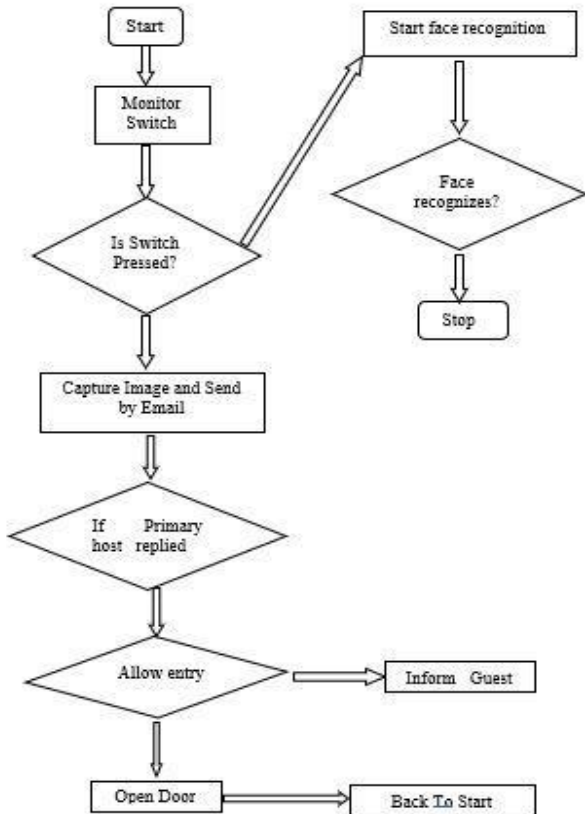
A. Block Diagram of a system

Fig. 1 Flowchart of Door Lock System

B. Main features of the system

Guest or stranger comes to your doorstep perform three tasks:
1. Clicks a picture upload to AWS S3 Bucket S3 Bucket issues a Simple notification service.
2. Device emails the photo to the owner of the house.
3. After which text is sent to AWS Polly audio is triggered returned by the Polly.
4. When notification is received from Amazon webservice notification or getting the email, the owner asks the Alexa introduce the visitor by invoking the Alexa skill "Door Guard" and saying: Alexa, ask door guard who is at the door? Lambda function is triggered which does the functions:
1. Photo uploaded to the S3 Bucket is scanned.
2. The face search request is initiated for the image to the AWS Recognition.
3. The AWS Recognition returns the face matches result and Lambda searches name DynamoDB and return the name if found.
4. The house owner receives the name of the guest via Alexa and the owner calls to open the door.

5. The Lambda sends an open-door command to AWS IoT to a specific MQTT topic.
6. The MQTT command is received by raspberry pi and it sends to the Arduino using the serial port. Arduino opens or close the lock depending on the command limit use of hard returns to only one return at the end of a paragraph.

C. Hardware Required

Arduino UNO:
Arduino UNO is a microcontroller and used as a interface between microcontroller board and raspberry pi though which we can administrate door locking system.

Raspberry pi and raspberry camera module:
It is a computer which include single board and has ability to run Linux, python on it and communicate with AWS and coalesce the camera module.

Amazon Alexa:
It is used for input i.e. voice input and provide output to user by controlling the door locking system. Amazon Alexa Skill Kit:
It is SDK (Software Development kit) used for colloquial purpose. Coding can be done in java Script, Python, Node.js.

AWS DynamoDB:
It helps to store the people name and Index which can be used to find guest effortlessly and it is totally managed by NoSQL Database solution.

AWS S3 Bucket:
This AWS service opens the door for storing the image of user, it is also known as object storing solution, it is easily available and cost of this service is minimal.

Amazon Recognition:
It is used for scrutinizing an image. It is capable of detecting, recognizing, remembering objects in image form.

AWS Lambda:
It provides serverless assess which runs code in specified environment hence it used to trigger different codes in Raspberry pi to perform accordingly.

AWS IoT:
It is a core platform which help to connect all devices to amazon web services, it also reduces security threat.

AWS SNS:
It is a messaging service which used for transmitting and receiving the message to end user. We used it here for sending mail to the end user with image.

AWS IAM:
AWS Identity Access Management provide permission to end user to authorize specific AWS Services.
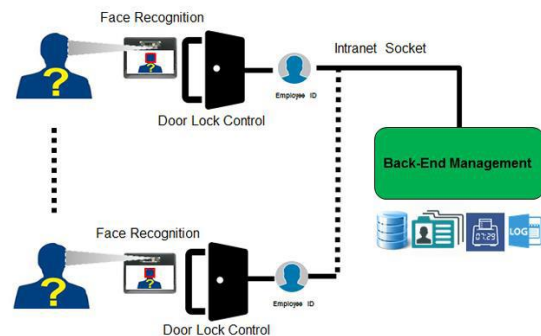

Fig. 2 Face Recognition Process

Retrieval Number: J75240891020/2020©BEIESP
DOI: 10.35940/ijitee.J7524.0891020
Journal Website: www.ijitee.org

330

Published By:
Blue Eyes Intelligence Engineering
and Sciences Publication

As shown in the figure when the guest or stranger arrives on the door there is face recognition which scan the face of that guest and greet his or her on the door and matches the face if face doesn't match with their system then it send email or scanned photo to the owner of the house or Alexa pass information to the owner to open the gate or not.

And all these processing is takes places in the amazon web services which is operated at the backend. An amazon services contains different types of services like AWS DynamoDB, S3Bucket, Lambda and many more. By all these services and different hardware's an owner of the house can operate the gate from anywhere without any physical exercise. This system increases the protection and security of the house. The gate only be opened when all the backend and frontend process is completed then it greets the guests and allow them to enter the house.
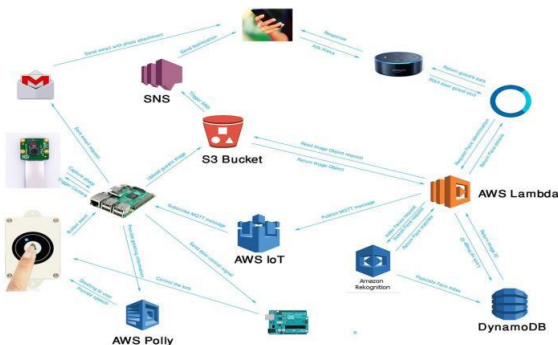

Fig. 3 Block diagram of AWS System

IV. CONCLUSION

Some well-known and popular door lock security are previously developed which are classified on technologies like password based, biometric based, card based, Bluetooth based. But this project is covering the use of virtual assistant Alexa along with cloud-based services and face recognition technology so that the security of the door can be managed by remote location. In this project, smart door lock system based on cloud computing which integrates of home securities with home and automation. Home securities for automation doors gives more security to the owner of the house in today's world. Since our proposed system is built over wireless sensors network. It is a easily be installed and friendly for the users without any overheard complicated work and it also doesn't need much planning and wired connection.

REFERENCES

1. L.Kamelia, S. R. Alfin Noorhassan, M. Sanjaya, and W.S. Edi Mulyana, "Door-automation system using bluetooth-based android for mobile phone," *ARPN J. Eng. Appl. Sci.*, 2014.
2. "(PDF) AUTOMATIC PASSWORD BASED DOOR LOCK SYSTEM Hamza Saeed Khan Academia.edu."https://www.academia.edu/20828187/AUTOMATIC_PASSWORD_BASED_DOOR_LOCK_SYSTEM.
3. A. Mishra, S. Sharma, S. Dubey, and S. K. Dubey, "PASSWORD BASED SECURITY LOCK SYSTEM," 2014. Available:www.ijates.com.
4. D. Pavithra and R. Balakrishnan, "IoT based monitoring and control system for home automation," in *Global Conference on Communication Technologies, GCCT 2015*, Nov. 2015, pp. 169–173, doi: 10.1109/GCCT.2015.7342646.
5. M. Ibrahim, A. Elgamri, S. Babiker, and A. Mohamed, "Internet of things based smart environmental monitoring using the Raspberry-Pi computer," in *2015 5th International Conference on Digital Information Processing and Communications, ICDIPC 2015*, Nov. 2015, pp. 159–164, doi: 10.1109/ICDIPC.2015.7323023.
6. Rabail Shafique Satti, Sidra Ejaz, Madiha Arshad, "A Smart
7. Visitors Notification System With Automatic Secure Door Lock Using Mobile Communication Technology", *International Journal of Computer and Communication System Engineering*, Vol. 02 No.01 February 2015.
8. A.O.Oke, O.M.Olaniyi, O.T. Arulogun, O.M. Olaniyan, "Development Of A Microcontroller-Controlled Security Door System.", *The Pacific Journal of Science and Technology*, Volume 10. Number 2. November 2009 (Fall).
9. S. Nazeem Basha, Dr. S.A.K. Jilani, Mr. S. Arun, "An Intelligent Door System Using Raspberry Pi And Amazon Web Services Iot", *International Journal of Engineering Trends and Technology (IJETT)*, Volume 33 Number 2- March 2016.

AUTHORS PROFILE

Shivangi Garg is presently 4th year student of B.Tech in Dept. of EEE at GL Bajaj Institute of Technology & Management. Her area of academic and research interest is Control and Automation. IOT.

Prachee Tiwari is presently 4th year student of B.Tech in Dept. of EEE at GL Bajaj Institute of Technology & Management. Her area of academic and research interest is Control and Automation. IOT.

Shubham Gupta is presently 4th year student of B.Tech in Dept. of EEE at GL Bajaj Institute of Technology & Management. His area of academic and research interest is Control and Automation. IOT and programming in C/C++.

Brijesh Prasad is presently an Assistant Professor in Dept. of EEE at GL Bajaj Institute of Technology & Management. His area of academic interest and research interest are Power System, Renewable Energy Control and Automation. IOT.

Hritik Mohan Gupta is presently 4th year student of B.Tech in Dept. of EEE at GL Bajaj Institute of Technology & Management. His area of academic and research interest is Control and Automation.