

# IOT Door Bell using Image Processing

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**Abstract:** *The objective of this project is to facilitate the user with a simple and customised technology to effectively manage visitors flowing to his/her premises. It is a real time smart doorbell notification system for home security. The system combines the functions of a smart and a house network system. It enables the users to monitor visitors in real time via the IOT based doorbell installed near the entrance door to a house. The doorbell can be controlled in a smart way to intimate the user with a picture and a text message of the visitor at the doorstep. When a visitor rings the doorbell, an SMS will be sent to the registered mobile number of the house member and the response in the form of an SMS will be displayed on an LCD screen placed beside the door so that the visitor can read the SMS and act accordingly. The visitor can also leave a voice message that will be sent to the house member. Fingerprint recognition can be added to provide additional security and to replace the traditional lock and key. The doorbell will be installed with an Arduino chip to transmit and receive messages. This system is also intended to serve old age people and to identify unauthorised intruders. In the age of technology, it is necessary to update our security systems and to make living easier.*

**Keywords:** IOT, Arduino, Smart doorbell

## I. INTRODUCTION

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, such as terrorist's identification, security systems and identity verification access. In fact it is implemented in many public and even dedicated areas. Thanks to well develop technologies to the computer science, we can obtain considerably good and satisfying result of face identification and reveal. The extracted detail from faces will be analyzed and compared with the already existing similar face operated details in the thingspeak database. In this paper, face recognition is initiated by pressing the doorbell button. Indeed, an integrated web camera will captured several pictures of the visitor. The face recently scanned will be verified in the present database. In case of unknown face, a message with captured image is generated and pop at the owner screen. Otherwise, in case of known face, actual face id is matched with face id's which is already stored in database and door will automatically open's for few seconds. Furthermore, the owner will be notified through his device connected with system. Comparing to old face recognition systems that are already commercialized, this project is more efficient in real time response with better recognition rate.

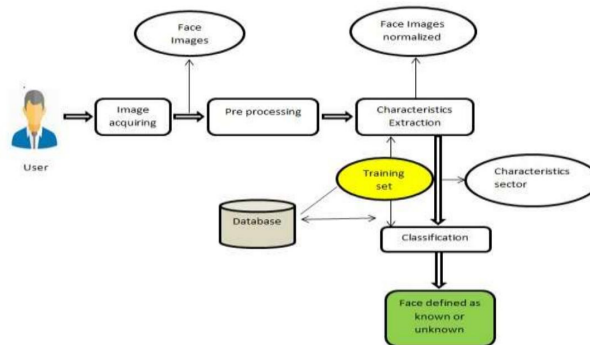
## II. LITERATURE REVIEW

Another research, 'Real Time Smart Door System for Home Security', they tried to implement the similar idea for a smart doorbell. According to this system, most of the proposed smart home systems try to bring solutions for security problem, but many of those systems use numerous sensor devices. Video based smart home security systems is an efficient approach with the development of video technology and Raspberry Pi is a strong and reliable embedded system device for the complex and challenging tasks. Using these technologies in the proposed system will bring several advantages in providing safety and security in terms of visualizing and identifying people who visit the home. In the overall proposed system, there will be two different significant techniques to provide home security. The paper, 'Automatic Safety Home Bell System with Message Enabled Features', focuses on IOT related automatic doorbell systems which are designed to ring the bell automatically when a visitor approaches the door. If the visitor stands for

more than a specified time span without the door being opened, an SMS will be sent to a registered mobile number of the house member and the response of the house member (i.e. in the form of an SMS) will be displayed on an LCD screen placed beside the door so that the visitor can read the SMS and act accordingly. This system was intended to service old age people and also to identify the unauthorized persons, if any.

### III. METHODOLOGY

Our model is unique with its one of a kind combination of functionalities offered and the simplicity of the model. A major difference is in the overhead reduction by an application as it detect the face out of the images and directly open the door in case of identified user otherwise it send the image directly to application program interfaced with our application, which has not been provided in existing model also it is cost effective. Here we avoided the use of unnecessary components like stepper motors and drivers as done in existing model. Also rather than using a low quality Raspberry Pi interfaced camera we have choose USB attachable HD camera to do efficient and reliable facial recognition. The objective of the proposed work is to implement a working model of smart door and to give a solution to the problem faced by people in day to day incident of burglary and also to promote and ignite the work being done on IoT systems and implanting it with the help of key research areas of Neural Networks and IoT APIs and protocols.



**Fig 3.1.** System Flowchart

### IV. PROPOSED WORK

I want to add some features to this existing device. Although the device has lots of features, still it has reduced existing drawbacks. To avoid those drawbacks we have to change the mode of power supply to the doorbell. Otherwise we have to include some commands in the software to get notify about it. Like, Instead of using batteries, charging feature helps more to this device. Because, if no one in home then how a person can change batteries. Then obviously, if battery ends then the device becomes useless then our motive of security will be spoiled. To get rid of this, the battery percentage should be notified to mobile daily and also should notify when the battery is supposed to dead. So that they can change batteries before itself. Otherwise, the automatic charging system should be added to this so that it automatically charges itself when the battery power reduces, when it reaches the level which we set

### V. CONCLUSION

The project named "Smart IOT Doorbell Surveillance" has been designed with the domain as Internet of Things. The basic concepts and working of IOT has been displayed in the running of the project. The project uses mainly an Arduino Board and OOPS programming concept. Since, today, in a technologically enhancing environment, security issues is of utmost concern, this project shows how technology can be used to enhance the security features of people's homes. A doorbell is constructed which has the feature to send a notification to the owner when somebody is at the door, with an attached picture of the person. It uses materials such as an Arduino Board, an Ethernet Shield (to send notifications across services), a doorbell, resistors and a web camera. This project enables users to stay connected to their homes and ensure safety, even when they're travelling.

**REFERENCES**

- [1]. General safety feathers by Transport Canada, 2007.
- [2]. Yang, X., Liu, L., Zhao, F., & Vaidya, N (2020), Vehicle-to-Vehicle Communication Protocol for Cooperative Collision Warning.
- [3]. Kurt Dresner& Peter Stone (2021), Replacing the Stop Sign: Unmanaged Intersection Control, pp.94-101, Estoril, Portugal.
- [4]. ARIB STD-T75, 2021 Zing Zhu, Sumit Roy. Dedicated Short Range Communication System.
- [5]. Sang-woo Chang, Jin-soo Jung, Jin Cha, Sang-sun Lee, Implementation of DSRC Mobile MAC for VANET.
- [6]. S. S. Dorle, Pratima Patel, Implementation of Adaptive Traffic Light Control System Based on Radio Propagation Model in Vanet.
- [7]. Usha Devi Gandhi, Arun Singh, Arnab Mukherjee and Atul Chandak, Smart Vehicle Connectivity for Safety Application