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A Survey on Keyless Approach to Home Security using Internet of Things

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Abstract: ***The main objective of our project is to upgrade the existing security standards for a smart living and there by construct integral home security system based on Internet of Things. This system provides enhanced security and reliability at minimal cost compared to the available security system. With the help of registered data, one can unlock the door by which it increases level of security to prevent an unauthorized unlocking. The security measures are ensured in two different ways, on one hand the user should be authorised on the control app and on the other hand with the help of specific password the user can operate door lock. The owner can enjoy various security options likewise, can enable face recognition techniques in the product. The system provides the user with safer and secure locking and unlocking systems***
Keywords: Home Security, IOT, Facial Recognition, Machine Learning, Raspberry Pi

I. INTRODUCTION

As we all know that the world around us is moving towards complete automation. Man with his brilliance is always behind so many inventions, and the principal of automation is one among his extra ordinary findings. As a result, here our team is trying to bring forth a product of wonder which promotes the concept of keyless access to your sweet homes. The key less technology is made possible with the help of internet of things and deep learning. This unlocking can be implemented as – smartphone app, face recognition and NFC using a Raspberry Pi. The idea towards smart keyless home security is emphasized in the project. The physical key us the most commonly used technique first locking and unlocking. The whole process is mechanical in nature. Once the key is lost, stolen it becomes difficult for the user. The problem relating to handling keys become worse in cases like in companies where the employees are to maintain many keys for several doors. Thus as a remedy to this problem, the keyless technology is being initiated. It allows the users to lock as well as unlock the doors thereby making it more flexible and convenient. Almost all keyless entry locks are just as easy or easier to install than their traditional counterparts. It enables users to lock and unlock their homes remotely, thereby providing enhanced flexibility and convenience.

II. LITERATURE SURVEY

Md. Maksudur Rahman, Md. Shoaib Akhter and Dr. Md. Sowket Ali (2018) proposes password protected electronic lock system for smart home security [1] by which it aims to overcome traditional locks in terms of security and the new security systems in terms of its cost efficiency. Here the user is prompted to enter the security code on the LCD screen and upon validating, if correct, rotates the servo motor to unlock the door. This product has a greater scope in which security is levelled up to many stages such as ID card scanning and biometrics.

Neelam, Ruhina and Priyanka (2016) proposes automatic door locking system [2] by literature surveys of several research papers to gain further knowledge and information about the new security systems being proposed/implemented which uses similar concepts. Automatic door locking systems using Bluetooth based Android for mobile phone is implemented through a custom app which locks and unlocks the door based on input code given.

Sourav Roy, Md Nasir Uddin, Md Zahirul Haque (2018) proposes the design as well as the implementation of an efficient door locking system with face recognition as one of its methods. The striking characteristic of the particular model is, that it has got a combination of many functionalities and it is much simpler in practice. There is also an efficient use of solenoid that eventually eradicate the use of stepper motors. This procedure can be further extended with the use of motor detection, tamper detection, and connecting the model with mobile application with the help of which users can remotely monitor their homes.

Jayant Dabhade, Amirush Javare, Tushar Ghayal (2017) has proposed in improving home security using Bluetooth technology by providing a low cost authentication system. It is sure that this technology can bring about changes in the technology thus reduces the number of crimes. This system is all about the use of keyless door lock system done efficiently by using smart phones. The system

has fit several many advantages that makes it stand out from the other products. It contains motion detectors which helps in determining the users. If a stranger tries to access the door, snaps will be taken by the camera and then it will be send to the owner. Also that an auto trigger report can be sent to nearest police station along with the home address. Adarsh V Patil, Akshay S, Sreevarsha Prakash (2018) proposes Android based smart door locking system by being designed under various modes which makes it purposeful.

The system is based on pre decided password concept. It provides extra security level so as to prevent any unauthorized unlocking. The owner needn't worry in case if he/ she forgets the password then there is option to reset it. In the future it can also be implemented by using cloud computing where the user can control the lock system worldwide. Also that more features like that of finger scanner and face recognition can be added.

Thulluri Krishna Vamsi, Kanchana Charan Sai (2019) proposes Face recognition door unlocking system using Raspberry Pi [6] by being fast and accurate. It restricts the entry of unauthorized individuals and intruders. It consists of a facial recognition security feature or a keypad is provided to enter the pass code to unlock the door. Since it involves face recognition or passcode, any individual knowing the passcode can access the entry to house. Since it mainly uses face recognition module, there might be chances that face might not be detected and door can't be unlocked. In future, Fingerprints can have been added instead of passcode, since it is unique.

The verification should include both facial recognition as the first step and finger print as its following step.

Jae-Young Pyun (2009) proposes Home Automation [7] by digital information such as a secret code, semi-conductors, smart card, and fingerprints as the method for authentication instead of the legacy key system. It provides high security as fingerprints are unique and hence can only be opened the owner. More flexibility and extensibility is also provided. It is a cost efficient, reliable, and easy to use system. Since the door can be opened by a secret code, semi-conductors, smart card. Anyone with the knowledge of secret code can get access to house by opening the door. In future, fingerprints, face recognition can also be added to make it more efficient and secure.

Tejas Saraf, Ketan Shukla (2018) proposes Automated Door Access Control System Using Face Recognition [8] by facial detection being performed using face detection techniques which is more effective, dependable, and consumes minimal data and power compared to other product as it is operated on battery power supply and wireless internet connection by using USB modem. The process of installing smart doors with python and opencv requires professional assistance. Ordinary people will find it difficult to handle it. In case if the software gets hacked, it would be difficult to open the door without professional assistance. If anyone hacks the email id of owner, the messages can be easily deleted without owner seeing it. In future, it can be made more simple and user friendly.

Karan Maheshwari, Nalini Nagendran (2017) proposes Facial Recognition Enabled Smart Door [9] by reducing the risk of burglary. We can also open the door without us being physically present at the door in case our friends of families come to meet us. There are situations where we get locked out of the house or inside the house, this situation doesn't arise if we install smart doors. Since the smart door uses facial recognition technology, there are drawbacks. Since it is software operated, hackers can hack the facial recognition technology and manipulate the database. In today's world, criminals won't find it difficult to create replica model of the owners face using latest technologies. In future, if a blacklisted person tries to open the door, software can be modified in such way that it sends emergency messages to the owner.

Ohsung Doh, Ilkyu Ha (2016) proposes A Digital Door Lock System for the Internet of Things [10] with improved security and usability by transferring the recorded images of the intruder to the owner's phone when an unauthorized person is trying to access the house or offices. It also sends alarming messages to the owners mobile if someone tries to physically damage the door. Since the messages are instant and fast, the owner will be able take required measures in case of unauthorized entries.

III.CONCLUSION

In this paper we provide a survey on keyless approach to home security using internet of things. This project was designed to improve user convenience by allowing him to lock or unlock the door lock remotely. we further use this survey to design our own solution to home security using IOT and facial recognition.

The main function of the prototype is to grant access to an authentic user who approaches the door, the door lock system carries out the opening and closing of the door without any extra operations. We expect that the proposed lock system if manufactured commercially can be converted into a useful product.

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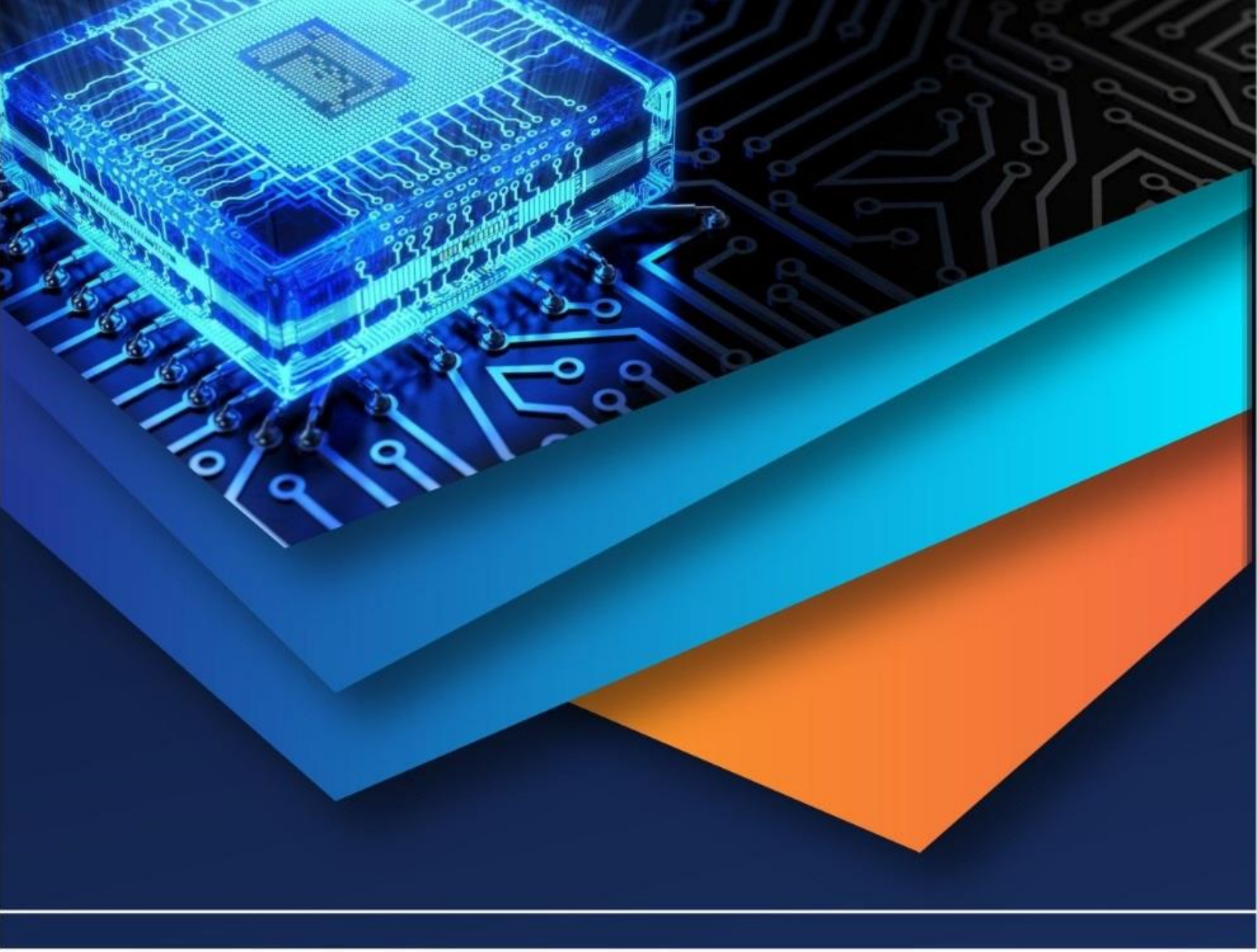

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