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A REVIEW ON SMART SECURITY SOLUTIONS BASED ON IOT

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ABSTRACT:

This paper deals with the Review of design and implementation of Smart surveillance monitoring system using Raspberry pi and fingerprint sensor. It increases the usage of mobile technology to provide essential security to our homes and for other control applications. The proposed The project aims at designing an intelligent access control system based on fingerprint technology. The proposed system makes use of finger print module for authentication process and an electromechanical relay switch to control magnetic door locking system for door accessing. The system also supports with camera based image capturing technique when any wrong finger print was detected and alerts through email from wireless Wi-Fi connectivity.

KEY TERMS: Smart Security, IOT, Raspberry Pi Processor.

INTRODUCTION:

Raspberry pi is a smart card sized computer it has designed to function as a computer and carry out various activities. There are two major surveliance systems available in the market right now cameras and CCTV. But the disadvantage with both surveliance techniques is the person or object is must be in the surveliance range of that particular camera or CCTV. On the contrary if we use smart security solutions we can observer the person or object even if it is moving from one place to another. .The other major advantage is that it is a simple circuit and easy to use. The only compulsory here is smartphone used must have an Raspberry pi for accomplished of image transfer. Internet of Things (IoT) can define as interconnection between animal, object or people that has ability to exchange data over network without involving human-computer or human-to human interaction. IoT is designed for various kinds of connectivity from devices, systems and services that work within machine-machine communications (M2M) and cover with applications, domains and protocols. [1]. In today's modern world implementation on IoT has become most prominenent research area, as it may reduce burden on humans for carrying out day to day activity. The IoT devices also can be found useful in various critical applications e.g. heart monitoring, automobile built in sensor, biochip responders used with farm animals, fire extinguishers etc. [2]. On the records of McKinsey Global Institute, IoT has many market applications that can be useful in day to day line and shown big potential to create big economic impact in the range of approximately $50 trillion may be by 2030[4].

IoT is not futuristic technology trend, it is something already exists in our smart phone devices and other business computing tools. In fact any software or device reducing human efforts can be correlated with IoT even giant machine in production plant. The big IT company, Microsoft has forayed in innovating applications of IoT by for various business models. Right now Microsoft corporation is working on the analyzing various needs of different business and industries, by collecting, processing and storing various data that can be feed to IoT. This method was extends from broad product range such as PC, tablets and industry devices on edge of enterprise network to backend system and services develop tool and diverse partner ecosystem [5]. In 2007, bridge collapsed incident in Minnesota [6], the cause of this tragic accident is steel rods were inadequate to handle total load. If we are implement smart technique for monitoring the crack, stresses war page e.g. sensor, the tragedy sure can be escaped. It known as "ambient intelligence" when there are many object act in unison. The project aims at designing an intelligent access control system based on fingerprint technology. The proposed system makes use of finger print module for authentication process and an electromechanical relay switch to control magnetic door locking system for door accessing. The system also supports with camera based image capturing technique when any wrong finger print was detected and alerts through email from internet connectivity.

The sensor is a solid-state fingerprint sensor that easily and reliably taken fingerprint information. Basically it is designed to integrate between any two devices for improved security and for improving convenience. The sensor is designed it is reliable, user friendly, low cost, quick and much more secure than passwords and PIN's when it comes to authentication. The Raspberry Pi is a low cost, smart card sized computer, which can be used in various electronics projects. This tiny device capable of doing many things

like computing, storing etc. In short this tiny device capable of doing many things like our desktop computer or laptop does.

The Raspberry Pi is a smart-card-sized single-board computer developed in the UK by the Raspberry Pi Foundation. The Raspberry Pi has a Broadcom BCM2835 system on a chip (SoC), which includes an ARM1176JZF-S 950 MHz processor, Video Core IV GPU, and was originally shipped with 256 megabytes of RAM, later upgraded to 1GB. It does not include a built-in hard disk or solid-state drive, but uses an SD card for booting and long-term storage.

In this project we make use of a finger print module, Wi-Fi module, and Raspberry Pi processor. The processor reads the input from the finger print module and when the authentication details are correct then the system automatically opens the magnetic door lock and closed after predefined time using relay switch. The data base of the operation of the door along with timings gets stored in PC application using Wi-Fi wireless communication. The system also captures the image of the user who provides wrong authentication of finger print and sends alerting message with image to the predefine d email using Wi-Fi wireless communication to PC application.

LITERATURE SURVEY

In 2006, many researchers, academicians, industrialist were assembled in foundation trustee eben for developing a computer for children. The developed computer was inspired by Acorn's BBC Micro of 1981. There were few models already developed by the British educational council (BBC) they are termed as a microcomputer, by taking the reference of Pi's model A, model B and model B+. The very first prototype of the tiny computer was mounted package of having size like USB memory stick. It was having an USB port on one end and HDMI port on the other side. The foundation goal was clear to offer cheap computer may be in the range of 25$ to 35$. They also had started accepting orders for higher version (model B) from February 2012. For the lower end model they started taking orders from first week of February 2013, the lower cost model was in the range of 20$. The raspberry Pi is low cost version, is in small size and on board computer. It was designed like if you just plug in computer monitor or television , keyboard, mouse, pendrive etc. Raspberry Pi is equipped with software called scratch, which is intended for designing program and design different kinds of animations, game or may be an interesting video. However another advantage of using Raspberry pi is programmer can also developed script if they are aware of writing programs using python language. Python is been used as a core language while developing raspbian OS[8]. Raspberry Pi B+ is more advanced than model B. As stated earlier python language is used for writing the script for client/ server communication purpose. Few improvements are carried out over model B e.g. more GPIO header PIN, USB ports, less power consumption etc. Moreover, in the same paper it is entitled that uses of model B+ over model A as it more advanced and offers good flexibility. For print service open source software samba is been used to SMB/CIFS clients. For last few years this software is giving good results though it is an open source software. The advantage of using samba is it can be well interfaced between Linux/Unix server very easily.

The IoT (Internet of Things) are network of real objects, buildings, mobile phones, TV's, vehicles and many other items that we use in day to day life. But when it comes to IoT, it will get equipped with embedded with electronics, softwares, network connectivity and various types of sensors for accessing the real world information. The IoT will allows objects to be sensed, measured and controlled by using remote applications across the developed network. In 2013, the vision of IoT has taken a great step in the convergence of multiple technologies, ranging from wireless communication to the internet andn from embedded system very small electromechanical system. Giving a clear indication of IoT can be used in day to day life.

The network smart devices was introduced in the early of 1982, with remeblence to improved coke machine Carnegie Mellon university and it was first internet connected appliance. And it was able to give report pertaining information related to the inventory and whether the newly made cold drinks are cold or not. Mark Weiser's seminal wrote paper in 1991 on ubiquitous computing, "The Computer of the 21st Century", and UbiComp and PerCom produced the contemporary vision of IoT. In 1994 Reza Raji introduced the concept in IEEE Spectrum as "[moving] small packets of data to a large set of nodes, for the integrate and automate everything right from home appliances to entire factories". The concept of the internet of things [IoT] first came in picture and became famous in 1999, through the Auto-ID Center at MIT and related market-analysis publications. RFID (Radio-frequency identification) was seen by Kevin Ashton (one of the founders of the original Auto-ID Center) as a first and basic prerequisite for the internet of things in that era.

RELATED WORKS:

Jin-Hee Han ; Cyber Security Syst. Res. Dept., Electron. & Telecommun. Res. Inst., Daejeon, South Korea

Recently, smart home appliances and wearable devices have been developed through many companies. Most devices can be interacted with various sensors, have communication function to connect the Internet by themselves. Those devices will provide a wide range of services to users through a mutual exchange of information. However, due to the nature of the IoT environment, the appropriate security functions for secure and trustworthy smart home service should be applied extensively because the security threats will be increased and impact of security threats is likely to be expanded. Therefore, in this paper, we describe specifically the security requirements of the components that make up the smart home system.

Zhaoqing Peng ; College of Information Science and Engineering, Northeastern University, China It is important to realize more intelligent home security system (IHSS) for daily lives. We propose IHSS utilizing agent-based Internet of Things (IoT) devices. The proposed system is capable of monitoring sensors and autonomously controlling actuators to flexibly construct security services. This paper describes a design of IHSS and some prototype systems.

Vijay Sivaraman: the increase in number of smart home automation products e.g. smoke-alarms, lights, switches, weighing scales and baby monitors increases the privacy and security concerns at expronentionally increasing rate. It thus allows legitimate and illegitimate entities to snoop and intrude into the family's activities. In this paper author has tried to illustrate the threats using real physical devices currently available in the market. But as we know the golden rule in case of digital communication more longer and if many devices are connected to the system, the system is more vulnerable to security breach. In this paper author has emphasized on the individual device level security rather than the communication network security. And author has also proved by experimental results device level security is much better than the communication network security. Author has proposed software based networking technology be used for dynamically block devices on the basis of aritifical intelligence considering parameters like time of the day, person in home and various other aspects.

V. Sandeep: In today's world, various appliances at our home are smart for becoming our lives easier. Therefore it is necessary to control these appliances remotely and make more smarter for solving real life problems. To automate a machine, a another brain may be an artificial intelligence or any other electronic device is required for controlling the main machine. The brain machine is called as 'Think' and control machines to do tasks as per the convenience of the user from very long distances like offices. An automation developed for the users for controlling the home electronic appliances with high mobility and security. The model developed which implementing this paper uses a set of switches which will be controlled by the internet based on IoT technique, which uses raspberry pi as an backend software for controlling the main board. The work flow of this method is very simple and easy to use, it also can be used from the internet by the user having system password and correct URL. On the website customized and user friendly virtual buttons are provided on the website for controlling the appliances. Raspberry pi is located in a room which will connected to all electronic appliances in the home which in turns controls the electromagnetic relays.

Ana Marie. D Celebre : This paper emphasizes on the different techniques of home automation that had been designed to control the devices automatically for providing security, efficiency and ease of control to the user. On the contrary, voice based digital assistant e.g. SIRI by Apple provides location independent access to internet and local networks. In this paper study has been focused on implementation on a home automation system by using capability of Apple SIRI's of speech recognition in conjuction with raspberry pi as a low cost automation system. The results produced after implementing algorithm written in this paper as follows:SiriProxy was installed on the Raspberry Pi as a proxy server. The system has been tested and verified through speech recognition's accuracy tests, response latency tests and success rate tests. A total of 34 subjects with different English accents tested a total of 14 voice commands with a total of 390 trials. The tests verified that the system's average latency is at 2.12 seconds with an overall success rate at 93.3333% on at least 3 trials and 87.381% success rate on at least one trial.

Cesar Cheuque ; Universidad Andres Bello, Today, the constant evolution of the technology has enabled people to access information which were not possible before. The concept of Internet of Things (IoT) is a new step of processing information technology, which allows people to understand about their environment and how they can control the variables that affect their lives. One of these variables is to handle events that occur within houses. Our proposal in this paper is describe an university project whose purpose is the first approximation of a system using Web technology Raspberry Pi to control different LED devices, allowing inclusion of modules and be a real alternative in the implementation of a Smart Home. As a result of our proposal, we have offered an alternative to Smart Home environment to a big set of people allowing the control home applications that use LED technology.

In addition, we conducted a test with students to obtain new guidelines that were not considered at first instance and, through the testing with people, we observed non-functional characteristics that were relevant in our work.

CONCLUSION:

Finally the review has been carried out for most important papers pertaining to this area. Real time authentication system using finger print module. Door accessing using relay switch Wrong authentication capture of image using camera Email alerts through image using Wi-Fi Pc application based data base storage for door accessing is more advantageous in all types of Embedded Linux based Smart security system using Iot And Raspberry Pi processor.

REFERENCES

1) "*Internet of Things Global Standards Initiative*". ITU. Retrieved26 June 2015.
2) "*The Supply Chain: Changing at the Speed of Technology*". Retrieved 18 September 2015.
3) Dave Evans (April 2011). "The Internet of Things: How the Next Evolution of the Internet Is Changing Everything" (PDF). Cisco. Retrieved 15 February 2016.
4) Wood, Alex. "*The internet of things is revolutionizing our lives, but standards are a must*". Theguardian.com. The Guardian. Retrieved31 March 2015.
5) J. Höller, V. Tsiatsis, C. Mulligan, S. Karnouskos, S. Avesand, D. Boyle*: From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence. Elsevier,* 2014, ISBN 978-0-12-407684-6.
6) O. Monnier: A smarter grid with the Internet of Things. Texas Instruments, 2013.
7) I. Demirkol, C. Ersoy, F. Alagoz *MAC protocols for wireless sensor networks: a survey IEEE Communications Magazine*, 44 (2006), pp. 115–121
8) J. Al-Karaki, A. Kamal *Routing techniques in wireless sensor networks: a survey IEEE Wireless Communications,* 11 (2004), pp. 6–28
9) A.T. Campbell, S.B. Eisenman, N.D. Lane, E. Miluzzo, R.A. *Peterson, People-centric urban sensing, ACM*, 2006.
10) E. Kanjo NoiseSPY: *a real-time mobile phone platform for urban noise monitoring and mapping Mobile Networks and Applications*, 15 (2009), pp. 562–574
11) S. Santini, B. Ostermaier, A. Vitaletti, *First experiences using wireless sensor networks for noise pollution monitoring, ACM, Glasgow*, Scotland, 2008.
12) S. Kuznetsov, E. Paulos, *Participatory sensing in public spaces: activating urban surfaces with sensor probes, in: ACM Request Permissions*, 2010.
13) R. Honicky, E.A. Brewer, E. Paulos, R. White, N-smarts: *networked suite of mobile atmospheric real-time sensors, ACM,* 2008, pp. 25–29.
14) R.V. Kulkarni, A. Förster, G.K. Venayagamoorthy *Computational intelligence in wireless sensor networks:* a survey IEEE Communications Surveys & Tutorials, 13 (2011), pp. 68–96
15) Y. Bengio *Learning Deep Architectures for AI (first ed.)*Now Publishers Inc. (2009)
16) G.P. Bonneau, G.M. Nielson, F. Post (Eds.), *Data Visualization: The State of the Art, Kluwer Academic,* London (2003)
17) L. Ren, F. Tian, X. Zhang, L. Zhang Daisy Viz: *a model-based user interface toolkit for interactive information visualization systems Journal of Visual Languages and Computing,* 21 (2010), pp. 209–229