Theft Prevention System using IoT

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Abstract - *In today's world, security and safety have always become a basic necessity for the urban population. With the rapid urbanization, development and progress of big cities and towns, the graph of crimes is increasing in sharp rate. So, seeing this scenario, we propose Theft Prevention System using IoT which helps to secure and guard our house in our absence. This system monitors the entire floor movement detection. As soon as the movement is detected on the floor, the owner will be notified through an app. Whenever the thief enters in the house, and steps on the floor, immediately it is sensed by the sensor which passes on the signal to raspberry pi controller which in turn processes it to be valid signal and then moves the camera to the area where movement was detected and then transmits it over the Internet for the home owner to check the image.*

Key Words: **Anti-theft System, IoT, Raspberry Pi, Piezo Sensor, Alarm**

1. INTRODUCTION

In the modern epoch, security and surveillance are important issues. Different acts of theft and terrorism have emphasized the urgent need for the surveillance to be more efficient and instant notification of ongoing thefts to house owners and other household members. A number of surveillance solutions are currently available on the market, such as CCTV cameras and digital video recorders (DVRs) that can record the unauthorized activities of a trespasser, but these devices are only limited to some extent and countered very easily [1].

The purposed system can be used to enhance the security that can be run over IOT. This system makes use of A Raspberry Pi board, Piezo sensors, Servo motors, Buzzers and capacitors.

The purposed system can be used in existing IOT based home security system. We design and develop the components based on the devices given above. The development consists of the hardware and software components. The software components focus on UI and control of the system, the hardware components give the mechanical working of the system.

2. NECESSITY OF NEW SYSTEM

Nowadays, burglars have become more technologically aware and have carried out burglaries using smart gadgets like gas-cutters, smart anti-lock systems, and many more [2]. For such burglars, it is straightforward to disconnect CCTV camera surveillance, which has an indirect connection to the digital video recorder. That is why, there is a need to modify existing systems and propose an intelligent approach that can provide unsupervised human activity monitoring and can also stop an ongoing theft by notifying the house-owner at the earliest opportunity.

The new system overcomes most of the generic system limitations and tries to increase the IOT based security system on an appealing new level. The idea of identifying movement on the floor and capturing the picture of that particular point as soon as the movement is detected and identifying the user is a near to real time identification of threat [3].

3. LITERATURE SURVEY

The expansion of the embedded systems has yet to come to its peak and has been fast expanding in today's world therefore, subject matter related to this field is available in profusion.

"The ARM Architecture" by Leonid Ryzhyk has been a great help to us as we understood the multitude of the ARM processors in the field of the embedded systems. ARM is a family of reduced instruction set computing architectures for computer processors, configured for various environments. Arm Holdings develops the architecture and licenses it to other companies, who design their own products that implement one of those architectures that incorporate memory, interfaces, radios, etc. It also designs cores that implement instruction set and licenses these designs to a number of companies that incorporate those core designs. ARM processors hold an exceptional blend of features that makes ARM the most popular embedded architecture today. ARM cores are very simple related to most other general-purpose processors, which means that they can be manufactured using a comparatively small number of transistors, leaving plenty of space on the chip for application-specific microcells [3].

"Python to Accelerate Embedded SoC Design" by Evangelinos Lograns, Orsalia G. Hazapis, and Elias S. Manolakos was a great help to us as we learnt with the help of python programming the ability of enhancing the build limitations of the embedded systems. Developments in the engineering of Programmable Logic Devices (PLDs) over the last decade have established Field Programmable Gate Array (FPGA) as the main computing podium in a wide range of applications [3]. FPGAs nowadays possess a large amount of available resources, extending from logic blocks and Block RAMs (BRAMs) to arithmetic/multiplier blocks and hardwired embedded processor cores. Complex FPGA devices can be used to replace numerous ASICs and programmable processor ICs, leading to a parts discount and also diminishing the size of circuit boards. FPGAs are also the best platform for applying hardware/software co-design ideologies, since multiple hardwired or soft processor cores can be hosted on a single device. The purpose of the systems which are not limited to automations are also used in life and medical sciences infrastructures. The capabilities of the system with integration to the programming languages are yet to reach its peak with the combabilities.
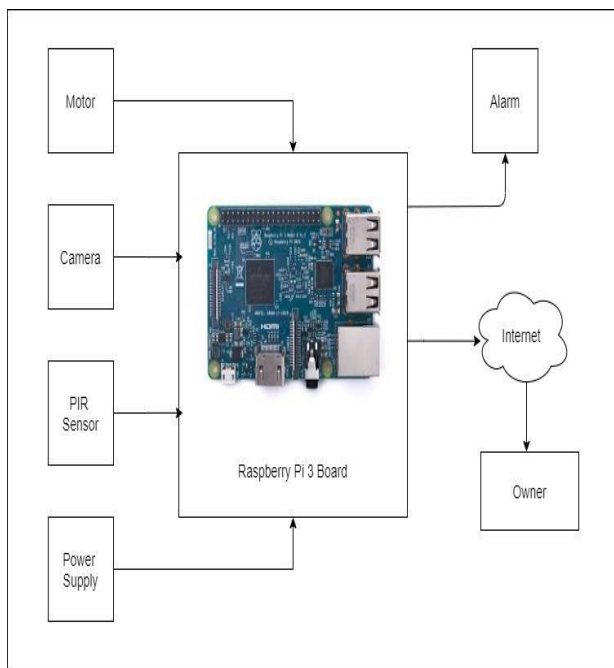
4. PROPOSED SYSTEM

Fig 1: Block Diagram of Proposed Work

The block diagram of IOT based Theft Prevention System is shown above. As shown in the diagram, the system consists of various different components which work together to complete a specific purpose. The system we have implemented rather works on detection of any contact rather than sensing any movement which as a result makes the system much more competent. The Piezo sensors are organized and connected in the walking zone of a floor [2]. A Piezo sensor is a device that uses the piezoelectric effect to measure changes in pressure, acceleration, temperature, strain, or force by converting them to an electrical charge. These sensors, when it detects any abnormalities in pressure or strain while it is monitoring. The alert is sent of the location where those anomalies are detected. The camera is in turn activated and captures the cause of anomalies. The owner is then alerted of this event through the internet who is left to decide either it's just a false alarm or a potential threat [1]. Thus, the efficiency of this system is incremented and made more effective as it responds on the owners' feedback prior to taking any action.

5. CONCLUSION

The main purpose of this project is to produce a system combination of Surveillance, alarm and home appliance monitoring system for the urban user and small and medium entrepreneurship in setting up a device which is capable to monitor, alarmed electrical appliances throughout the building, and this is a bumper jack for those who runs mini markets and Cybercafé this project will enables them to save cost, time, maintenances etc. in handling the device if compared to the expert security system [4]. As an inference, Theft Prevention System using IoT project is a simple project which gives a lot of benefits to those SME's in order to run a business in budget less than expected. The Home Monitoring and Security System gives a lot of benefit and advantages to the user whether a home user, small and medium enterprise, or even for the big enterprise such as Hypermarkets and resorts because this device will reduce the expert Surveillance cost to the company because of its feature which allows us to monitor, manipulate and alarm our home and premises. This will save their cost in installing expert Surveillance which is expensive. By using this device, owners of the establishment can use the saved amount of money via using this device, to other important things, to enhance their business [3]. Therefore, this Home Monitoring and Security System is a must for those who want to reduce the cost while having the optimum home security and monitoring equipment.

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