



IoT-BASED THEFT DETECTION USING RASPBERRY PI

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I.INTRODUCTION

Abstract— For urban inhabitants, security and safety have always been a must. CCTV cameras are used to monitor and detect things. Because of the usage of a computer, CCTV cameras are expensive for surveillance. It takes up far too much space for continuous recording, and it also necessitates the use of labor to detect illicit activity. To solve the problem, we used Raspberry Pi and IoT. In comparison to existing systems, the Raspberry Pi is significantly less expensive, has a higher resolution, and uses less power. We use image processing on live video to detect theft using motion and also highlight the area where motion occurred in this project "IOT-based theft detection project using Raspberry Pi," in which we use image processing on live video to detect theft using motion and also highlight the area where motion occurred. We use a camera, a Raspberry Pi, and storage in this system. When a camera detects motion, the system employs image processing to pinpoint the exact location of the motion and highlights it. The technology now sends photographs of the occurrence to the user's computer via IoT, where they may be seen online. It also saves the video to a USB device for later use. The user can now decode data transmitted over the internet via IoT, and use the IoT system to view photographs of motion occurrences live over the internet. As a result, the system offers a novel method for IoT-based Theft Detection.

In our more technologically aware society, theft prevention would be a godsend. Many theft detection systems are available to catch the thief, and they can be improved even more. In some cases, the thief cannot be apprehended using this technology. Even if the thief is apprehended, the victim will lose access to his or her valuables. "It is better to prevent than to cure." The person will not suffer any harm if the theft is avoided. The goal of the research is to evaluate an operating system's performance on an embedded system. Before diving into the implementation, a brief overview of the project's components is required. "IoT-based theft detection project utilizing Raspberry Pi" is what we suggest here. With cloud services dominating the ever-increasing electronics product market, the Internet of Things (IoT) has ruled the electronics era. This technology protects offices and residences against theft by detecting theft instantaneously and allows the user to examine the details of the theft, highlighting the details and recording the video to a USB drive. We use a camera, a Raspberry Pi, and a circuit with an LCD display with infrared for night vision and a USB drive for storage in this system. A 12V power supply is used to run the system. When camera motion is detected in the video, the system employs image processing to pinpoint the precise location of the motion and highlights it. The technology now sends photographs of the occurrence to the user's computer via IoT, where they may be seen online. The online system is built

with IoT Gecko here. It also saves the video to a USB device for later use. The user can now use the IoT Gecko IoT system to decode the data supplied online and examine the images of the motion event live over the internet. As a result, the system uses IoT to deliver a novel method for theft detection.

II. LITERATURE SURVEY

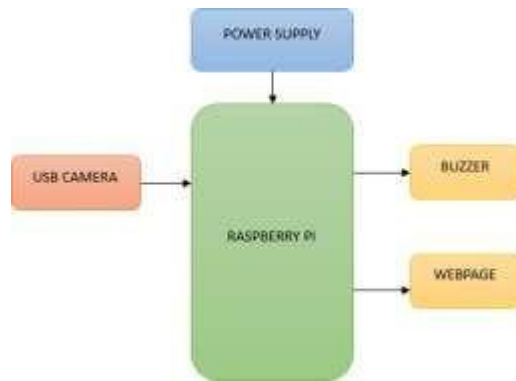
[1]. Surya has applied a model which constantly captures the surroundings and if there is any moment, it activates the mild and captures the screenshots that affect sending those to a legal person as an alert. [2]. The Chandana have proposed a model with the use of an RP-3 version and Gyroscope sensor. When a motion is spotted, the camera takes the photo and then forwards a vigilant electron mail with the spotted photo. The sensor information is imagined in the procedure of charts on Thing Speak. [3]. The Chinmaya has proposed a smart surveillance system using the RP-3 model and face recognition. Which gives the energy to manage by turning the system ON, primarily created at the incidence of every signal. The system will recognize the movement and relying on the detected movement machine will turn on the camera, capture the photo of the trespasser and it will send a notification to the owner's telephone if the person isn't identified by the system. [4]. Umera Anjum has projected a system that is the internet of thing issue-based mostly detection victimization RP3 that has shown a way to come to be a totally purposeful embedded system established from scrape. This enclosed the cross-compiling and ready of it's collections, the formation of embedded Kali Linux, and software as a service. Whenever the motion was detected. [5]. Priya has proposed a smart motion detection model using RP3. In which model, she had expected to modify the model so that the model can fulfill the requirement of the person for the scrutiny area. It has an application and it will be used in every platform and setup of surveillance. [6]. Sadhana has proposed a review of the stolen prevention system using the RP-3 model and Passive Infrared sensor. The proposed model is capable of espy presence of a person using the RP-3 model as a server module. This will lead to the prevention of stealer. [7]. Adrian McEwen is a creative Technologist and Entrepreneur based in Liverpool.

He concentrates on how the IOT intersects with people's lives and how heterogeneous networks of devices should work together. [8]. Oliver Hersent has proposed the book "The Internet of Things – key applications and Protocols" in which he had described the M2M area network physical layer and he suggests the working of the IoT. Oliver working on technology that helps in the IoT sector. [9]. Priya B. Patel has proposed a model which aimed to work in such a manner that it can fulfill the needs of the consumer for specific surveillance areas. It has limitless application use in the field and it may be used in distinctive situations and set-ups. [10]. Amira Barki has proposed the ETSI M2M architecture over and above most of the common blowout M2M applications beforehand telling the undefined problem that arises in M2M communication. [11]. Michael Miller has set up recognition for virtually explaining the technology subjects to non-technology readers and for providing beneficial real-world advice about the Internet of Things system. He has also explained how IOT changing the world. [12]. Kamal Raj has proposed a tainter-network device that can physically provide the service to exchange the data of the IoT service. [13]. Nikita Meshram has proposed a low-cost home automation system based on the MSP430 microcontroller. She provides manual as well as automatic mode control. [14]. TS Vishnu Priya has proposed a paper in which he tells about the system he had created to recognition of faces and he applied the system to different analysis fields. [15]. Sushma Jaiswal has proposed a system where she discusses how hard is to recognize of the face in low light and night time so she presents the feature which takes only the keypoint in the face image not rather the whole image.

EXISTING SYSTEM:

In some security systems, IR sensors are used to sense the presence of a human (housebreaker). Then it notifies the homeowner about the illegal activity or theft and the buzzer starts ringing. The notification to the user is sent by Bluetooth or SMS. The user becomes aware of the intrusion by receiving a notification. Also, people in the neighborhood will become alert of theft because of the alarm. The

homeowner can take appropriate action after this. An infrared sensor is an electronic instrument that is used to sense certain characteristics of its surroundings by



emitting and/or detecting infrared radiation. Infrared sensors are also capable of measuring the heat being emitted by an object and detecting motion. IR sensors need to have a direct line of sight between the transmitter and receiver because it does not work through walls or doors. They must be almost directly aligned (i.e., able to see each other) to communicate. They are blocked by common materials such as people, walls, plants, etc. Due to short-range performance drops off with longer distances. They are affected by environmental conditions like direct sunlight, rain, fog, dust, and pollution. The data transmission rate is lower than wired transmission. Bluetooth is wireless LAN technology that is designed to connect devices with different functionality for example telephone, notebook, computer (desktop, laptop), camera, and printer when these devices are at a short distance from each other.

PROPOSED METHOD:

In this proposed system, theft can be prevented using Raspberry Pi. In this system camera, buzzer, and relay, are connected to Raspberry Pi. Cameras are able to detect the presence of human beings. After detecting any person, relays are triggered to switch on the lights. As soon as the lights are on, the buzzer will start ringing for the specified time. After the lights are turned on an image will be captured using cameras. This captured image will immediately upload on the web page, which can be used as evidence. In addition, the victim receives a notification in the form of a text message. The power supply to this system is given by an adapter. As the lights turn on and the buzzer rings, the

neighborhood becomes aware of the theft. This will make the thief scared and the thief would try to escape the location. Thief is notable to execute his/her plan, belongings will be safe. This system can be implemented in jewelry shops, homes, etc.

BLOCK DIAGRAM:

HARDWARE DESCRIPTION:

RASPBERRY PI

Raspberry Pi 4 Model B is the latest product in the popular Raspberry Pi range of computers. It offers ground-breaking increases in processor speed, multimedia performance, memory, and connectivity compared to the prior-generation Raspberry Pi 3 Model B+ while retaining backward compatibility and similar power consumption. For the end user, Raspberry Pi 4 Model B provides desktop performance comparable to entry-level x86 PC systems. This product's key features include a high-performance 64-bit quad-core processor, dual-display support at resolutions up to 4K via a pair of micro-HDMI ports, hardware video decodes at up to 4Kp60, up to 4GB of RAM, dual-band 2.4/5.0 GHz wireless LAN, Bluetooth 5.0, Gigabit Ethernet, USB 3.0, and PoE capability (via a separate PoE HAT add-on). The dual-band wireless LAN and Bluetooth have modular compliance

certification, allowing the board to be designed into end products with significantly reduced compliance testing, improving both cost and time to market.

USB CAMERA

A digital digicam is an optical device that records photographs that may be saved directly, transmitted to another location, or both. These photographs can be still photographs or shifting photographs such as videos or movies. The term digital digicam comes from the word digital digicam obscura (Latin for "darkish chamber"), an early mechanism for projecting photographs. The current digital digicam developed from the digital digicam obscura. The functioning of the digital digicam may be very just to the functioning of the human eye.



Fig. USB Camera

RESULTS:**CONCLUSION:**

The project “IOT Based Theft Detection Using Raspberry PI” has demonstrated how to get a fully functional embedded product developed from scratch. This included the cross-compilation and deployment of essential libraries and the configuration of embedded Linux and cloud computing technology. This system is suitable for small personal area surveillance. i.e., personal office cabin, bank locker room, parking entrance. Whenever the motion is detected through. The main Advantage of the project is Ease of implementation, Low cost with High quality.

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