

## IOT BASED ATM MAINTENANCE AND SECURITY SYSTEM

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**Abstract**— In this project the ATM maintenance has been done with the help of various sensors. Sensors like smoke sensor, PIR sensor, Accelerometer, light sensor and temperature sensors act as input devices and the relay circuit acts as an output device which helps to turn ON and OFF the external devices. Here the Raspberry Pi Microprocessor controls all the input and output devices. All the values from the sensors are sent to the maintenance unit with the help of an IOT server. Here we also add an RFID tag and a USB camera for verification and security purposes. The RFID is used to read the ATM card and once the card is read the USB camera will scan the iris of the user for verification. The values from the sensors and RFID are continuously monitored by the maintenance team and if there is any change in any of those sensors, the maintenance unit can notice immediately with the help of IOT. This system is much easier and more reliable than all the other existing systems.

### I. INTRODUCTION

The Internet of Things (IoT) is that the network of physical objects or "things" embedded with electronics, software, sensors, and network property, that permits these objects to gather and exchange information. IoT permits objects to be detected and controlled remotely across existing network infrastructure, making opportunities for additional direct integration between the physical world and computer-based systems, and leading to improved efficiency, accuracy and economic profit. "Things," (ATMs) were first introduced in 1939. Nowadays, concerning three million units area unit put in worldwide. Because the variety of ATM units increase, the machines area unit susceptible to hacker attacks, fraud, robberies and security breaches. Within the past, the ATM machines main purpose was to deliver cash of bank notes and to debit a corresponding checking account.

However, ATM machines have become additional difficult, and that they serve varied functions, so changing into a high priority target to robbers and hackers. Trendy ATM machines are enforced with high-security protection measures. They work beneath advanced systems and networks to perform transactions. The information processed by ATMs area unit sometimes encrypted, however hackers will use discreet hacking devices to hack accounts and withdraw the account's balance. As an alternate, unskilled robbers threaten bank patrons with a weapon to loot their withdrawn cash or account.

### II. PROPOSED SYSTEM

In our project we are using various sensors like temperature, light, PIR, smoke and Accelerometer to continuously monitor the ATM machines. We also use RFID and a USB camera to identify the customer. All the values are sent to the maintenance team for security purposes. We also use a relay circuit to switch on and switch off the ATM machine shutter. Hence this system is more efficient and secure than all the other existing systems. In the proposed system we use an IOT based ATM monitoring and control system. The ATM is monitored with a vibration sensor, light sensor, smoke sensor and temperature sensor. If any person tries to break the ATM it will be detected using a vibration sensor and immediately the door lock will be activated. The light sensor is used to detect light intensity and the temperature sensor is used to detect external temperature. A SMOKE sensor is used to detect the fire occurrence in the ATM. Raspberry Pi is a credit card sized single board computer with ARM11 microprocessor with a LINUX based operating system. ADC is required to convert the analog sensor signals to digital signals and then gives as input to the Raspberry Pi. Python is used as the programming language in Raspberry Pi, which is an open source programming language.

### III. BLOCK DIAGRAM

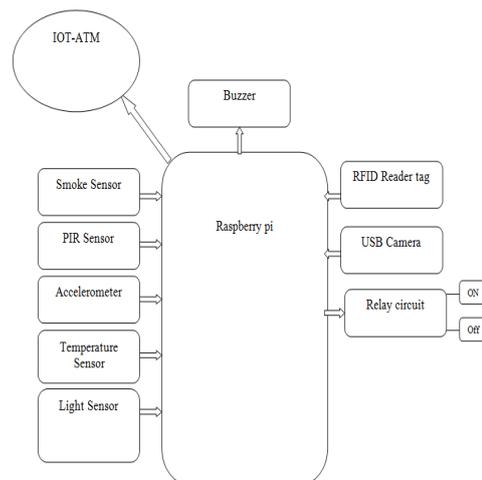


FIGURE 1. BLOCK DIAGRAM.

#### IV. FLOW DIAGRAM

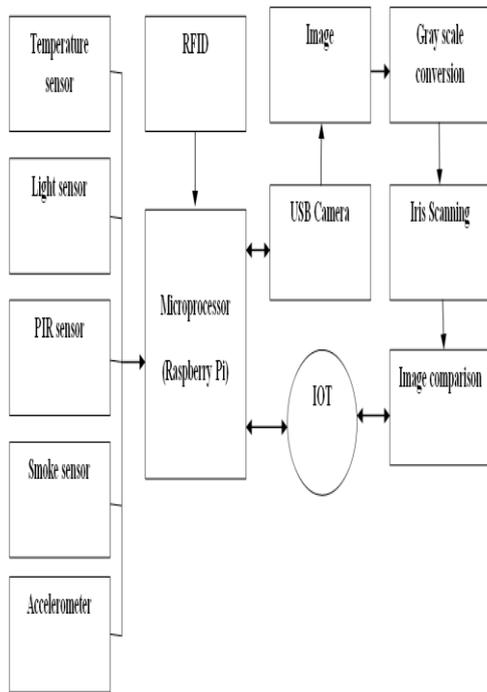


FIGURE 2. FLOW DIAGRAM.

#### V. WORKING

Continuous monitoring of the sensors in the system so that any burglary attempt is detected. Informing the controller that the sensors have been triggered and necessary safety actions are due. Buzzer: The controller then activates the alarm system through the driver to dissuade the burglary attempt. Shutter locking: The controller then activates the motor locking down the kiosk and the culprits are locked inside. Electrical hazards can be monitored and controlled. IOT enabled control operations. The raspberry pi microprocessor processes all the input data and activates the output devices according to the input. Sensors like smoke, light, PIR, temperature, and accelerometer are connected to the input pins of the raspberry pi. RFID and USB Camera also connected to the input of raspberry pi. The relay and Buzzer are connecting to the output pins. The apply voltage for all the sensor and output devices are 5V. All the values are sends to the webpage with the help of IOT.

#### VI. IRIS PROCESS

Recognizing a individual creating use of passwords is not adequate for a stable personal authentication since they' will be effortlessly shared, or stolen. These days, automatic authentication has clothed to be very fashionable. Completely different applications wish individual identification like passport management, cell

phones security, laptop access management, electronic banking, ATM, airfield security and then on. Instead of utilizing "what someone has" or "what, someone recalls" it's additional applicable to utilize "who someone is". The innovation exploring this idea is observed as life science. A biometric framework assembles raw info from varied body components, like fingerprint, iris, palm print, voice, retina etc. Then, it utilizes a feature extraction rule to alter this raw info into biometric templates and that they area unit saved in very information. Iris recognition could be a most promising biometric methodology that's accustomed determines folks. It's mounted and doesn't Modification throughout the period of time of someone. The arbitrarily distributed options of associate iris area unit the foremost distinct reality regarding iris recognition system. Iris is sweet for one-to-many identifications and therefore the speed of comparison is additionally high. one entry of iris guide will last for a protracted time, therefore frequent change isn't required.

As appeared within the figure, Iris could be a circular body structure placed within the middle of tissue layer and lens of the attention. Its operate is dominant the sunshine coming into through the pupil. The common iris diameter is between eleven.6 metric linear unit and twelve.0 mm, and therefore the pupil live is between 100 percent and eightieth of the iris diameter. The most well-known and industrial iris system was planned by J. G. Daugman. For these algorithms, he has the patents and people forms the premise of most of today's industrial iris recognition systems. Currently iris system is with efficiency employed in varied applications handling giant information. Associate iris recognition system structure for changing associate iris image to the corresponding guide is delineating in figure

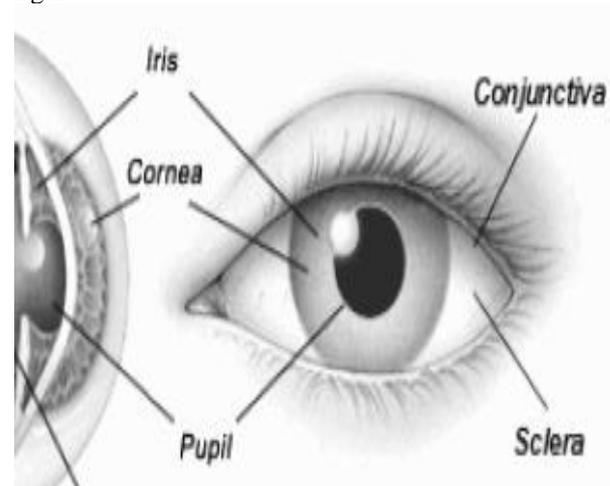


FIGURE 3. PARTS OF EYE.

A high-quality camera is employed for capturing iris pictures. Near-infrared illuminators area unit used for obtaining the made iris options. Reflective reflections because of a bright background area unit avoided

mistreatment the NIR spectrum. The segmentation could be a method to segments the ring-shaped iris regions of a watch image. The iris region is assumed as 2 circles delimited by iris-pupil and iris-sclera. The eyelids and eyelashes area unit generally interference in iris segmentation, these area unit avoided mistreatment some threshold ways. Rubber sheet model of Daugman's is employed for social control. Each component within the iris portion is remapped to a combine of polar coordinates throughout social control. It helps in obtaining a typical format.

The pupil center is assumed because the reference. The feature encryption derives the foremost variable capabilities of iris and ends up in a binary encoded format. The playing distance calculation is employed for the matching method, wherever a playing distance worth of zero indicates an accurate match and one indicate non-match

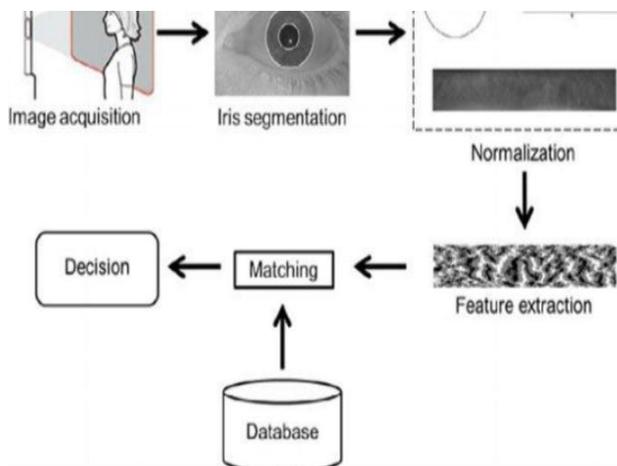


FIGURE 4. IRIS RECOGNITION SYSTEM.

### VII. FACE DETECTION METHODOLOGY

The face detection rule contains totally different methodology for detection the face. the first strategies for face detection are Haar based mostly rule and Local Binary Pattern based rule (LBP) . Within the projected system, the face is detected from the image victimization Haar cascade feature. Face Detection victimization Haar could be a machine learning based mostly approach wherever a cascade perform is trained from a great deal of positive and negative pictures. Viola and Jones are the one who originated the concept of using Haar wavelets and developed the supposed Haar-like features. A Haar-like feature considers adjacent rectangular regions at a particular location in an exceedingly detection window, sums up the element intensities in every region and calculates the distinction between these sums. This distinction is then wont to reason subsections of a picture. For example, allow us to say we've got picture information with human faces. It's a standard observation that among all faces the region of the eyes is darker than the region of the cheeks. Therefore a standard Haar feature for face

detection Could be a set of two adjacent rectangles that lie on top of the eye and therefore the cheek region. The position of those rectangles is outlined relative to a detection window that acts sort of a bounding box to the target object (the face during this case). The Haar cascade files are supported within the OpenCV. OpenCV comes with a trainer similarly as detector. Here we will modify detection. The XML files are kept and used to compare for detection by built-in-functions.

### VIII. HARDWARE KIT

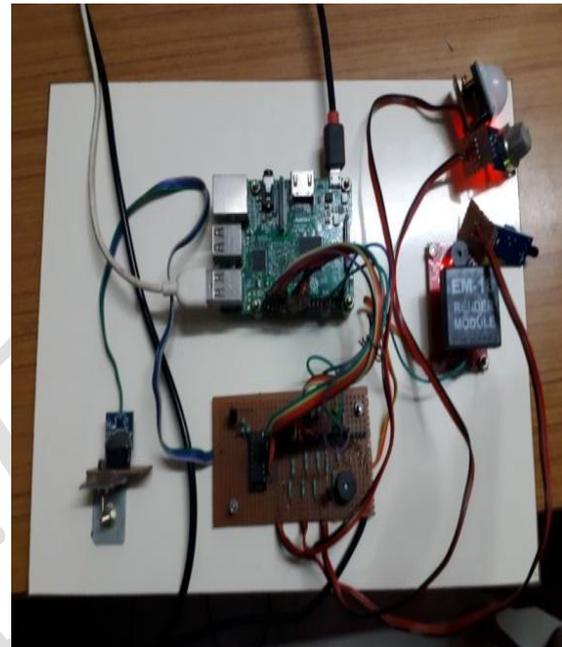


FIGURE 5. HARDWARE KIT.

### IX. FINAL OUTCOME OF THE PROJECT



#### IOT based ATM Monitoring System

Last Update	Temperature (C°)	PIR	Light On / Off	Fire Alert	ATM Theft
2019-02-14 17:16:58	20	No Motion Detected	Light in OFF	No Fire	No Theft Alert

delete images



Updated time :2019-02-14 20:32:44 Card No:2400487EC2D0

Image 1 of 2 Previous Next

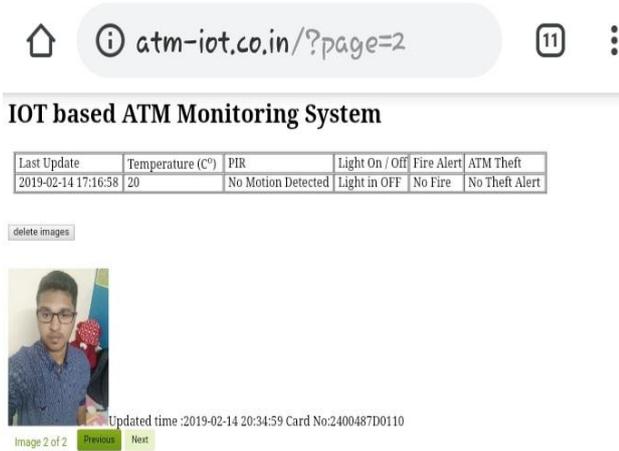


FIGURE 6. OUTCOME OF PROJECT.

## X. CONCLUSION

From the above proposed system it is clear that various techniques are available to avoid robbery in ATM. We have proposed different approaches by different researches for ATM monitoring and security. Generally in all other papers they use the sensors to monitor the unusual activities by GSM, but in our project we update the unusual activities by using IOT and we also added iris recognition, the person eye was captured by the camera and the iris of the eye was detected using the raspberry pi controller with the help of python coding successfully. The proposed method reduces the cost and also increases the efficiency.

## XI. REFERENCES

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