Retraction

Retraction: Automatic teller machine abnormality detector using machine to machine technology (J. Phys.: Conf. Ser. 1916 012141)

Published 23 February 2022

This article (and all articles in the proceedings volume relating to the same conference) has been retracted by IOP Publishing following an extensive investigation in line with the COPE guidelines. This investigation has uncovered evidence of systematic manipulation of the publication process and considerable citation manipulation.

IOP Publishing respectfully requests that readers consider all work within this volume potentially unreliable, as the volume has not been through a credible peer review process.

IOP Publishing regrets that our usual quality checks did not identify these issues before publication, and have since put additional measures in place to try to prevent these issues from reoccurring. IOP Publishing wishes to credit anonymous whistleblowers and the Problematic Paper Screener [1] for bringing some of the above issues to our attention, prompting us to investigate further.

[1] Cabanac G, Labbé C and Magazinov A 2021 arXiv:2107.06751v1

Retraction published: 23 February 2022
Automatic teller machine abnormality detector using machine to machine technology

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Abstract. The Automatic Teller Machine (ATM) anomaly detection is an area of research aimed at preventing physical and electronic theft from ATMs as well as securing their installations. This is achieved by using Machine to Machine (M2M) technology. M2M is a communication technology. It allows for real-time tracking without the need for human interference. Using an anti-skinning defence device, we can detect fraud invisibly. An individual wearing a helmet or mask can be recognized using recognition technology, and anomalies can be identified using vibration and flame sensors. This application is used in ATM centres to improve security.

Keywords: Haar cascade algorithm, Image processing, M2M, Raspberry pi.

1. Introduction
Face Recognition is a programme that uses contrast and a database of images to automatically recognize a person [1]. A test picture is taken with the aid of a camera from a still source or video outline, and is compared with the database pictures for character after reflecting there are a number of potential face appearances. Analysis is enthralled by this area because of its many applications in various environments. One of the business applications of face recognition frameworks may be to start with simple login applications, leading to the development of a high security access control system, safe biometric based exchange, or extremely checked observation framework. A collection of data and procedures that are used to confirm or verify the character of a person or to meet all security requirements [2]. 2 confirmation is a process in which two or a large number of different elements zone before they are willing to show the citizens using higher than problem is commonly referred to as "Strong Confirmation." The method for a range of answers to challenge questions, such as retrieving "something you have" or "something you are," is multifaceted [3].

A programmed telecommunication device that provides access to financial transactions for the financial institution is known as an Automated Teller Machine (ATM). As a result, the number of ATM centres has increased in recent years. Despite the fact that money is stored in ATM machines, there is a high risk of robbery. It can result in significant losses of human and social resources. ATMs have been robbed in a number of ways. Card and currency fraud, logical attacks, and physical attacks are three distinct types of ATM threats. Physical assaults are the main focus here. Various video
surveillance-based systems have been developed in order to deter these attacks. The use of credit cards in single-board computers such as the Raspberry Pi has facilitated the production of various automated and monitoring systems with low power consumption, faster processing capabilities, and lower costs. This paper proposes an ATM guard system that eliminates the need for security personnel in ATM centres [4-8].

2. Existing system

2.1. ATM Monitoring System Using MATLAB

This paper determines if an individual is wearing a mask and also the number of people who are entering the ATM. It only emits a warning signal in the event of an irregular situation and does not transmit any messages to the approved individual [9]. As a result, using MATLAB will slow down the system's execution compared to using a compiled language, and it will be more expensive than using the raspberry pi.

2.2. ATM Monitoring System Using ARM Processor

This paper is used to detect anomalies in the ATM using a smoke sensor and a camera for monitoring the ATM, and it provides user name and password by using an ARM processor. However, the ARM processor has limited memory capacity to serve the embedded page to a web browser, and the scheduling of instructions makes debugging difficult [10].

2.3. Anomaly Detection Using CCTV

They suggested a method in this paper that uses CCTV cameras to recognize referred to obscure ATM assaults. They have programmed a demonstrate age method to differentiate ordinary activities from abnormal activities that occur in ATMs, but there is now a possibility of breaking and using chemical sprays to cause the camera to malfunction, and there are no protection equipment’s to detect more abnormal activities in ATMs.

3. Proposed system

In our proposed system, the person wears mask or helmet will be recognized using Haar cascade algorithm and the person wearing mask or helmet does any abnormality it will be detected using vibration sensor or flame sensor then the image will be captured and mailed to the authorized person and SMS will be send and the door will be closed once the abnormality is detected figure 1.

Figure 1. Block diagram layout of proposed system

3.1. Sensor manager module
The system is written in Python, and the Raspberry operating system is used to monitor the hardware connected to the Raspberry Pi and to upload the software that enables them to communicate.

4. Hardware components

4.1. Libraries

The Raspberry Pi 3 Model B is the third era of the Raspberry Pi in figure 2. This solid single-board Visa machine will supplant the first Raspberry Pi Model B+ and Raspberry Pi 2 Model B in an assortment of uses. Table 1 shows the Raspberry Pi 3 Model B keeps up the regular load up design while adding an all the more impressive processor that is multiple times quicker than the Raspberry Pi original.

![Figure 2. Raspberry pi 3 Model B](image)

### Table 1. Raspberry pi specification

| Components           | Range                                                                 |
|----------------------|-----------------------------------------------------------------------|
| Processor            | 64 bit quad core processor ARMv8 CPU at 1.4 GHz                       |
| Memory               | 1GB SDRAM                                                             |
| Connectivity         | 2.4 GHz and 5GHz IEEE802.11.b Wi-Fi, Bluetooth 4.2, throughout 300 Mbps |
| Access               | 40 pin GPIO header                                                   |
| SD Card support      | Micro SD format                                                      |
| Input Power          | 5v/2.5A DC                                                           |
| Operating Temperature| 0-50°C                                                                |

4.2. Vibration sensor

The switch will be turned on when vibration is detected. The conductive current roller in the switch can shift or vibrate, causing current to detach or resistance to increase, triggering the circuit in figure 3.
4.3. Flame Sensor

To detect flame or fire, a flame sensor is used. It can detect ordinary light sources in the 750nm to 1100nm wavelength range. The flame sensor's output can be digital or analogue. It can detect distances of up to 100cm. It can also be used in a robot that fights fires in figure 4.

Features:
- Operating Voltage is 3.3V to 5V DC
- Operating Current is 15mA
- Digital output is 0V to 5V. Adjustable trigger level from preset
- Analog output is 0V to 5V based on infrared radiation from fire flame falling on the sensor
- The angle detection is up to 60°
- Comparator chip LM393 makes module readings stable

4.4. Relay

Electrically and mechanically operated relays are available. It consists of an electromagnet and a series of contacts, with the electromagnet acting as the switching mechanism [11]. The relay circuit's operation is used to operate a high-power circuit with a low-power signal. High-end applications necessitate high-power relays to drive electrical motors, and the relay used for this is known as hyper relay in figure 5.
Figure 5. Relay control

Features:
- Input voltage is 12VDC
- Driver unit is ULN2003A
- Isolation unit is In4007
- Fast switching
- Motor forward and reverse operation

4.5. Camera
Effective Web Cam captures videos at up to 30 frames per second from any video source, including USB cameras, analogue cameras connected to a capture card, TV boards, FireWire camcorders (IEEE 1394) interface, and network cameras. When motion is detected in the monitored region, the programme will sound an alarm, email the captured images to you, and begin transmitting or recording video figure 6.

Figure 6. Camera for Continuous Monitoring

4.6. DC motor
Electrical energy is converted into mechanical energy by a DC motor. Motoring motion happens when a current carrying conductor is put in a magnetic field and experiences a torque. When a magnetic field and an electric field interact, mechanical force is created in figure 7.

Figure 7. DC Motor for door control

Features:
- Supply voltage is 5VDC
6. Result and Discussion

The proposed system and its control unit are made assembled as shown in Figure 9. The test result shows the validation of the objective of the project. The results show the detailed information related to vibration, fire alarm breach and other malpractices activity in an ATM. The proposed system may support to enhance the security of ATM.

Figure 9. Connection on the board
Figure 10. Python version 3.8 model

Once the circuit is connected, the device should be connected to the internet in figure 10.

Figure 11. System Output – Case 1

The analysis of our project is, when Vibration is detected the camera captures the image and mail it to the authorized person. When anyone covers the camera then alert message will be send in figure 11.

Figure 12 System Output – Case 2

When no face is detected in camera, then the camera captures the image and sends the alert mail. And if any intruder breaks the camera then it will automatically sends a message to the authorized person related to theft and it send the breached image through mail in figure 12-14.

Figure 13. Alert message for both vibration and fire detection.
7. Conclusion
In this paper, we used a Raspberry Pi microcontroller to create an alarm based on an ATM safe monitoring system. We used a vibrational sensor and a flame sensor in our design to detect any abnormalities in the ATM centre, and the data is also sent via mail to the approved individual. This project will be important in the future in order to develop the architecture. In the future, the human face will be recognized by detecting the characteristics of the eyes. It can detect contours in 3D format using contour-based detection technology. This device can be improved to identify abnormalities in ATM centres by tracking a person's movement.

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