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Unauthorized Event Detection System Based on Embedded Image Processing and IoT

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Abstract

Automated Teller Machines (ATMs) security is the field of study that aims at solutions that provide multiple points of protection against physical and electronic theft from ATMs and protecting their installations. From anti-skimming defend systems to silent indicate systems, integrated ATM video surveillance cameras, and ATM monitoring options, security specialists are ready to help people get more out of the ATM security and ATM loss prevention systems. The implementation is achieved with Machine learning, which provides real-time monitoring and control without the need for human intervention. The idea of a pattern matching platform suggests a new system architecture for positioning and monitoring applications with wider coverage and higher communication efficiency. The proposed work aims to implement a low-cost stand-alone Embedded & IOT based on microcontroller and LabVIEW. It offers a robust networking solution with a wide range of application areas over the internet. The Web server can be run on the LabVIEW platform, having limited resources to trigger Google (g-mail). The setup is proposed for ATM security, which comprises the authentication of the shutter lock module, web-enabled control, sensors, and camera control.

Keywords —*LabVIEW, IoT, Arduino UNO, IR Sensor.*

I. INTRODUCTION

The hardware work of this project is based on Automated Teller Machine Security. , if the image implies the person holding the object such as gun, helmet, and knife, the weapon detector used as a sensor will detect it and give the displayed result as the weapon has been detected. Also, it gives the alert beep sound. At the time, the LabVIEW accessed with Google's Gmail through the IoT process will send the mail of that image for the face identification of the thief.

Even after this process, if the person in real-time tries to open the door, it will not be opened. Only when there is no weapon detected, the door can be unlocked. The process will be normal if the person is not holding a weapon. The project mainly implies the security and secured environment that avoids theft and helps to find the person within a second, which consumes time.

II. LITERATURE SURVEY

The base paper Deep convolutional framework for abnormal behavior detection in a smart surveillance system-This research topic is closely related to state-of-the-art HCI (human-computer interaction) applications. In the most common user interface scenario, when a computer interacts with a human, it performs an operation corresponding to the command, transferred through a standard interface, such as a keyboard, mouse, and touchscreen. Recent HCI works have attempted to develop an approach that enables more intuitive interactions between a human and a computer through a computer vision framework. They tried to exclude as much as possible using separate interface devices for interaction, such as the human visual recognition process. It is widely believed that one of the next shifts in HCI will be the endowing of computers to understand human behavior through computer vision technology. This topic is increasing in popularity across the academic and industrial fields involving security/surveillance, industrial robotics, and affective computing. This trend has encouraged the computer vision community to address issues related to overcoming technical limitations from existing approaches based on the standard RGB camera. It is mainly based on human behavior detection while moving as a single or in a group.

III. HARDWARE/SOFTWARE DESCRIPTION

The software used in this was LabVIEW, which is used for real-time usage. The process in the LabVIEW takes place by the digital image processing and the IoT process. IoT is used for mailing purposes; that is, the person's images will be sent to the default mail id that has been fixed in. The other hardware components have been described below as,

A. Arduino UNO

Arduino UNO board has been used to interconnect the relay device, IR sensor, weapon detector, and the LabVIEW processing data's. It contains everything needed to support the microcontroller; connect it to a computer with a USB

cable or power it with an AC-to-DC adapter or battery to get started.

B. IR sensor

An infrared sensor is an electronic device that emits in order to sense some aspects of the surroundings. An IR sensor can measure the heat of an object as well as detects the motion. It has been used to sense the person who appears in the web camera.

C. Weapon detector

It is a sensor device designed to detect the power cells and other commonly used weapon profiles and metals. The data will be transmitted to the software updated system for the virtual analysis.

D. Relay Device

Relays are switches that open and close circuits electromechanically or electronically. Relays control one electrical circuit by opening and closing contacts in another circuit. It triggers the opening and closing of the electromagnetic door.

IV. PROPOSED WORK

This project is originated for the safety precaution in the ATM. The below-mentioned prototype implies the setup. The whole components have been connected with the Arduino UNO board and the LabVIEW software for further implications.

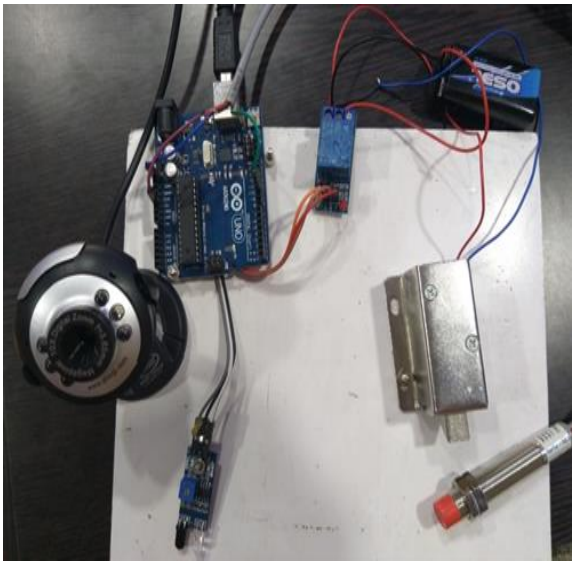

Fig 1: Prototype Model

The web camera placed in front of the ATM will capture the person who stands near the door. It captures continuously even if he is a normal person who is not having any weapon. Whatever the person, the image will be sent within a second through the mail

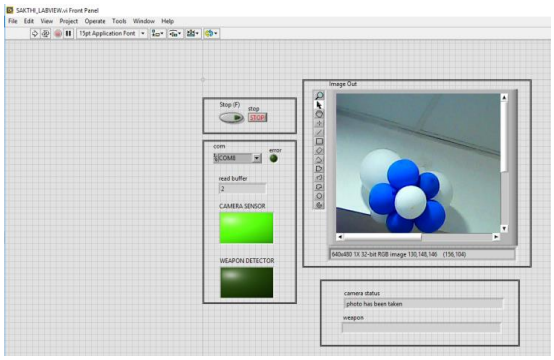

Fig 2: Image Sensing

The weapon detector detects or senses the image if the person is with the weapon, such as a gun, knife, helmet. This is then displayed in LCD, and as well as there will be an alert sound for instructing the person to put off the weapon.

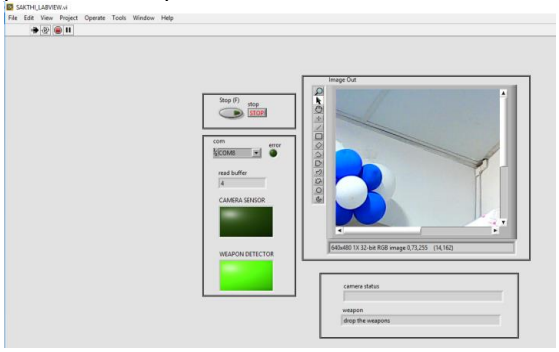

Fig 3: Weapon detection

If the weapon is detected, within a second, the image of the person will be mailed to the respective bank, bank manager, or the surrounding police station according to the recipient we have decided

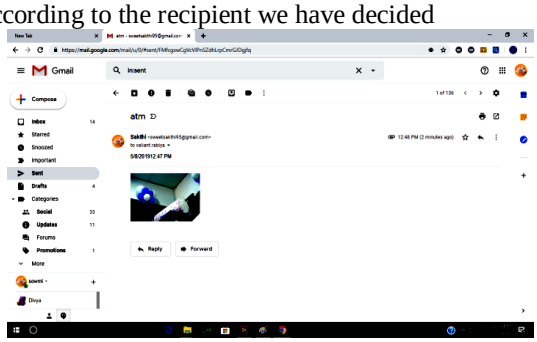

Fig 4: Sent Mail

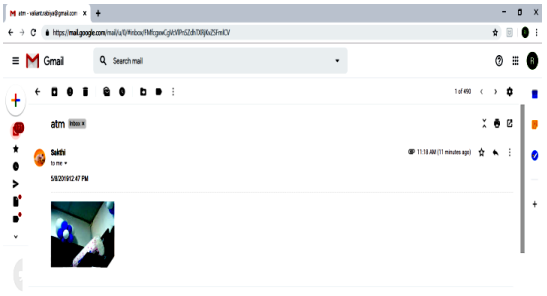

Fig 5: Received Mail

V. MERITS

Some of the Merits of the work has been given below:

- Avoidance of unauthorized events such as Bank and ATM robbery.
- Time would be reduced to find the thief by sending the image once if the person had a weapon
- It provides security mainly in the ATM and Bank.
- No need for manual security.
- Identification of the thief made ease by sending the image within a second after detecting the weapon to the appropriate bank or bank manager and the surrounding area police.
- ElectroMagnetization door made complex to unlock the door

CONCLUSION

The project is based on the avoidance of robbery in ATM and BANK. It implies that, If the person is entering an ATM or the bank, the invisible weapon detector or sensor will detect the weapon if he/she is holding it. Otherwise, the person can move on to the bank or ATM without any restrictions.

However, if the person is with the weapon, even it is hidden; the invisible detector placed will detect it and also will give the alert information to put off the weapon. Simultaneously, the real-time image of the person will be captured through the web camera placed in front, and it will send the image to the required recipient through the IoT process that we can decide such as to the respective bank, the bank manager, or the surrounding police station. Even after this process, if a person tries to unlock the door, the door will not be opened because the accessed magnetization door will be fixed to avoid the problem. This project in real-time makes the avoidance of robbery and further unauthorized events.

REFERENCES

[1] S.Ganesh Prabhu, K. Vinotha, M. Shanthala, S. Subhashini, S. Vishnu, "IOT Based Home Automation and Security System", SSRG International Journal of Electronics and Communication Engineering (SSRG-IJECE), vol. 4, no. 3, pp. 19-22, 2017.

[2] Ganesh Prabhu.S, Sangeetha.S, Shanmathi.S, Sharmila.M, "Automatic Toll E-Ticketing for Transportation Systems" SSRG International Journal of Electronics and Communication Engineering (SSRG-IJECE), vol. 4, no. 3, pp. 05-08, 2017.

[3] Ganesh Prabhu.S, R.R.Thirrunavukkarasu, S.Logesh Kumar, Karthik.S "Big Data Prologue Linking Cloud Computing to Ascertain the Smart Polling" International Journal of Current Engineering and Scientific Research ISSN (Print): 2393-8374, (Online): 2394-0697, Volume-4, Issue-9, 2017.

[4] Ganesh Prabhu.S, R.R.Thirrunavukkarasu, S.Logesh Kumar, Karthik.S "Lowering Glucose Elevations using Smart Head-on conjunction through virtual Congruence of Cloud on Internet" International Journal of Engineering Research in Computer Science and Engineering (IJERCSE) Vol 4, Issue 10, October 2017

[5] J Burns, Member, IEEE, C Steer, M Stapleton, S Quillin, J Boakes, C Eldridge, C Grove, G Chapman and A Lohstroh "Portable Muon Scattering Tomography Detectors for Security Imaging Applications".

[6] X. Chen, X. Li, H. Wu, and T. Qiu, "Real-time object tracking via cam shift-based robust framework," 2012 IEEE International Conference on Information Science and Technology, March 2012, pp. 527–530.

[7] B. Deori and D. M. Thounaojam, "A survey on moving object tracking in video," International Journal on Information Theory (IJIT), vol. 3, no. 3, pp. 31–46, 2014.

[8] Y. Habibi, D. R. Sulistyaningrum, and B. Setiyono, "A new algorithm for small object tracking based on super-resolution technique," AIP Conference Proceedings, vol. 1867, no. 1, p. 020024, 2017.

[9] Harris C. & Stennett C. "Rapid - A Video Rate Object Tracker", Proc. British Machine Vision Conference, BMVC-90, Oxford, pp.73-77, 1990.

[10] M. Isard and A. Blake, "Contour Tracking By Stochastic Propagation of Conditional Density," In Proc. European Conf. Computer Vision, pp. 343-356, 1996.

[11] Jie Wang, K.N. Plataniotis, A.N. Venetsanopoulos, "Selecting discriminant eigenfaces for face recognition", Pattern Recognition Letters 26 (2005), science direct.

[12] Kresimir Delac and Mislav Grgic,"Face recognition", I-TECH Education and Publishing, Vienna, Austria,2007.

[13] Kwang-Eun Ko, Kwee-Bo Sim "Deep convolutional framework for abnormal behavior detection in a smart surveillance system", School of Electrical and Electronics Engineering, Chung-Ang University, 84, Heukseok-ro, Dongjak-gu, Seoul, 06974, Republic of Korea.

[14] U.L. MeMakin, D.M. Shccn, 1I.U. Collins, T,E. Hall mid R.H. Scvcrtscn, Junc 1995, "Widcband, Millimetcr-Wavc, Holngrnptiic Wcxpons Survcillance Sys tcms", OU HOYI'O Symposium on taw Llnfurccment Teclmologics: Irlcntilicatiori Tcclinologics and Traflic Safely, Muiiicli, Germany.

[15] P. Salesmbier, L. Torres, F. Meyer, and C. Gu, "Region-based Video Coding Using Mathematical Morphology," Proc. of the IEEE, Vol. 83, No. 6, pp. 843-857, 1995.

[16] D.M. Shecn, D.L. McMnkin, 11.U. Collins, T.E. Halland R.H. Sevcrtscii, 1996, "Cont;e&xl Explosivc Dctcctim on Personnel Using *n* Widebnnrl Holographic Millimeter-Wave Imaging Systcni", AERO SENSE AcrnspacclDcfcnsc Sensing nrld Colitrols, Orlatirlo, Fin USA, Proceedings of ttic SFIC, Vol. 275.

[17] M.Turk. and A.Pentland., "Face recognition using eigenfaces", Proceedings of IEEE Conference on Computer Vision and Pattern Recognition, Maui, Hawaii, pp. 586-591, 3-6 June 1991.

[18] WeilongChen, MengJooEr, "Illumination Compensation and Normalization for Robust FaceRecognition Using Discrete Cosine Transform in Logarithm Domain," IEEE Transactions On Systems, Man And Cybernetics, Vol.36, No.2, April 2006.

[19] Shruthi. K and Ramaprasad. P, "Design of a prototype to detect mobile phone usage in restricted areas" SSRG International Journal of Electronics and Communication Engineering 2.12 (2015): 10-15.

[20] Piyush Kiran Redgaonkar, Ajinkya Prakash Sonar, Amit Sunil Tatar, R. Bhambhare, "Paper Title" SSRG International Journal of Electrical and Electronics Engineering 3.3 (2016): 16-18.

[21] D.Sangavi and N.Rajagopal, "Velocity regulator of AC motor with V/F controller" SSRG International Journal of VLSI & Signal Processing 3.3 (2016): 22-26.