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Enhanced ATM Security System with Automatic Abnormal Event Detection and Alert System to Reduce Banking Cost

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Abstract: ***Now a day's government taking various steps to enAable safety of the ATM, but it causes additional charges for the human security system. The method proposed here are higher security and cost effective based on checking many unusual events. This paper ensures enhanced ATM security system with automatic abnormal event detection and alert system to reduce banking cost by checking multiple unusual events like if more than one person entering inside the ATM, checking if cameras are removed or masked or checking if the person wearing helmet or not. If any of these conditions occurred, system sends an alert information to the nearest police station and doors of the ATM will be automatically locked and buzzer will on.***
Key points: -ARM Microcontroller, Vibration sensor, IR sensor, ATM(Automated Teller Machine), Mat lab.

I. INTRODUCTION

ATM is an electronic device which enable people to perform financial transaction. It is an important advanced technology with which people can easily withdraw the money 24x7. Therefore ATM's are constantly targeted by frauds and thieves to steal the money by tampering the ATM machine, attack on customer or by explosive and by hacking.
Mainly there are two types of attacks[3]

A. Physical Attack

The person intentionally do attack by weapon or damaging any devices called physical attack.

B. Logical Attack

This attack mainly causes to the web application as well abuse some files or uploading some files. This algorithm provides security against physical attack using sensors and by checking abnormal events using mat lab.

II. LITERATURE SURVEY

Paper presents algorithm which detects unusual events such as overcrowding are fight. It uses conventional low resolution cameras therefore it is cost effective but it does not detect uncommon events like steal the ATM[1].
Paper proposes enhanced ATM security ARM7 LPC2148.It uses GSM module if any unusual event occurred and then buzzer will on[2].
Paper proposes ATM security based on embedded Linux platform. It provides security by designing and implementation of face detection. If the human face is not detected properly, it send the OTP to watchman's registered mobile number and doors of the ATM will be automatically locked[3].
Paper proposes biometric security ,it compares the input image with the image stored in the data base. If the comparison gets satisfied then transaction will proceed[4]. Paper proposes ATM safety and security, it provides security to the ATM network to avoid manipulating the transmitted data, spoofing and misuse of ATM channels [7]. Paper proposes secured ATM transaction using GSM, if the person enters the password after swiping, if the password matches then ATM machine will send the alert message to the corresponding account holder. in this way this system provides security[9].

III. HARDWARE AND SOFTWRE REQUREMENTS

A. Hardware Requirements Are

1) ARM Microcontrolle
2) IR Sensor

3) Vibration sensor
4) LCD
5) GSM
6) H Bridge Circuit
7) Zigbee
8) Buzzer

B. Software requirements are:
1) Embedded
2) Mat lab

IV. PROPOSED BLOCK DIAGRAM

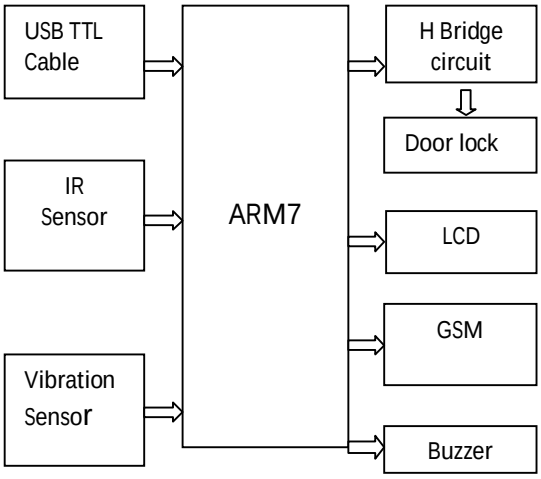

Fig 1: Block Diagram

A. ARM Controller

Fig 2:ARM7 LPC2148

ARM7 is a microcontroller. In this system it is used to process the information received by the various sensors and sends the appropriate information.
Features:
1) It is a 16-bit /32-bit microcontroller.
2) It has 8KB to 40KB on chip static RAM.
3) It has 32KB to 512KB on chip flash.
4) It has two 32-bit timer, PWM unit and watchdog.
5) Up to 21 external interrupt pins are available.

B. IR Sensor
IR sensor is referred as infrared radiation sensor. In this it is used to detect the person entered into the ATM or not.

C. Vibration Sensor

If anybody tries to damage the ATM, vibration sensor sends the information to the microcontroller.
It senses the vibration beyond the threshold.

D. Gsm

Here it is used to send the message to the nearest police station when any abnormal event occurred.[2]

E. Lcd

It is referred as liquid crystal display, here we are using 2x16 LCD display module to display the message when any abnormal event occurred.

F. buzzer

Buzzer is the audio signalling device. It alerts the system by producing sound.

V. WORKING PROCEDURE

ARM7 Microcontroller is heart of our system. Using mat lab it receives events through USB TTL cable and it process the information, if any unusual event occurred it produces alert sound by buzzer and doors of the ATM will be automatically locked and it send the message to the nearest police station.[2][5] If multiple person entered into the ATM or if the person mask the camera present inside the ATM room or if the person wearing helmet system will follow the same procedure as above[1]
If anybody tries to damage the ATM itself, using vibration sensor it sends the information to the microcontroller, microcontroller process the information and it follow the same as above to alert the system.

VI. FLOW CHART OF WORKING

Flow chart below shows how system will work when abnormal events occurred

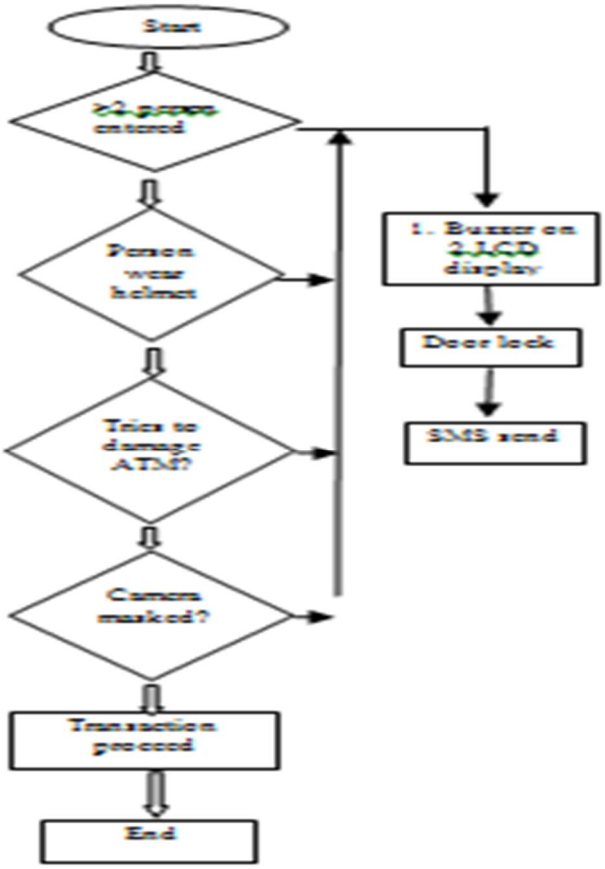

Fig 3: Flow chart for working

VII. RESULT AND OBSERVATION

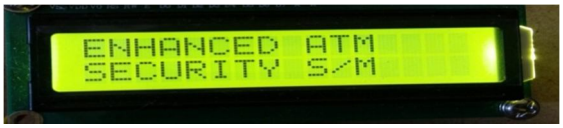

Fig 4: First validation message

Fig 5:when person detected

Fig 6: when unusual event occurred

Fig 7: when multiple person entered

Fig 8: when person wearing helmet

Fig 9:when camera

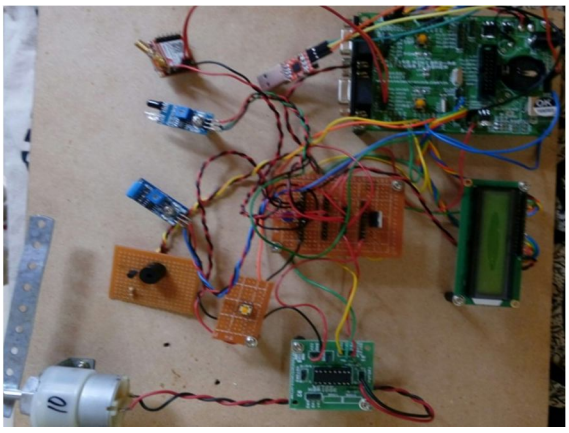

Fig 10:Final prototype

VIII. CONCLUSION

We implemented an ATM model for providing more security. Security features were enhanced largely for protection of ATM's when compare to previous systems. The system will built on the technology of embedded system which makes the system more safe reliable and easy to use. once the unusual event is occurred it send the signal to the nearest police station through the GSM(Global System For Mobile communication).

IX. FUTURE WORK

In our proposal , any abnormal event occurred SMS will send to the nearest police station but if there is any network issues then SMS will delay in future this problem will also overcome by sending email also. and instead of giving security to the each ATM, in future we can give security to all ATM's in a city at a time by using centralized server so it can control all ATM's at a time.

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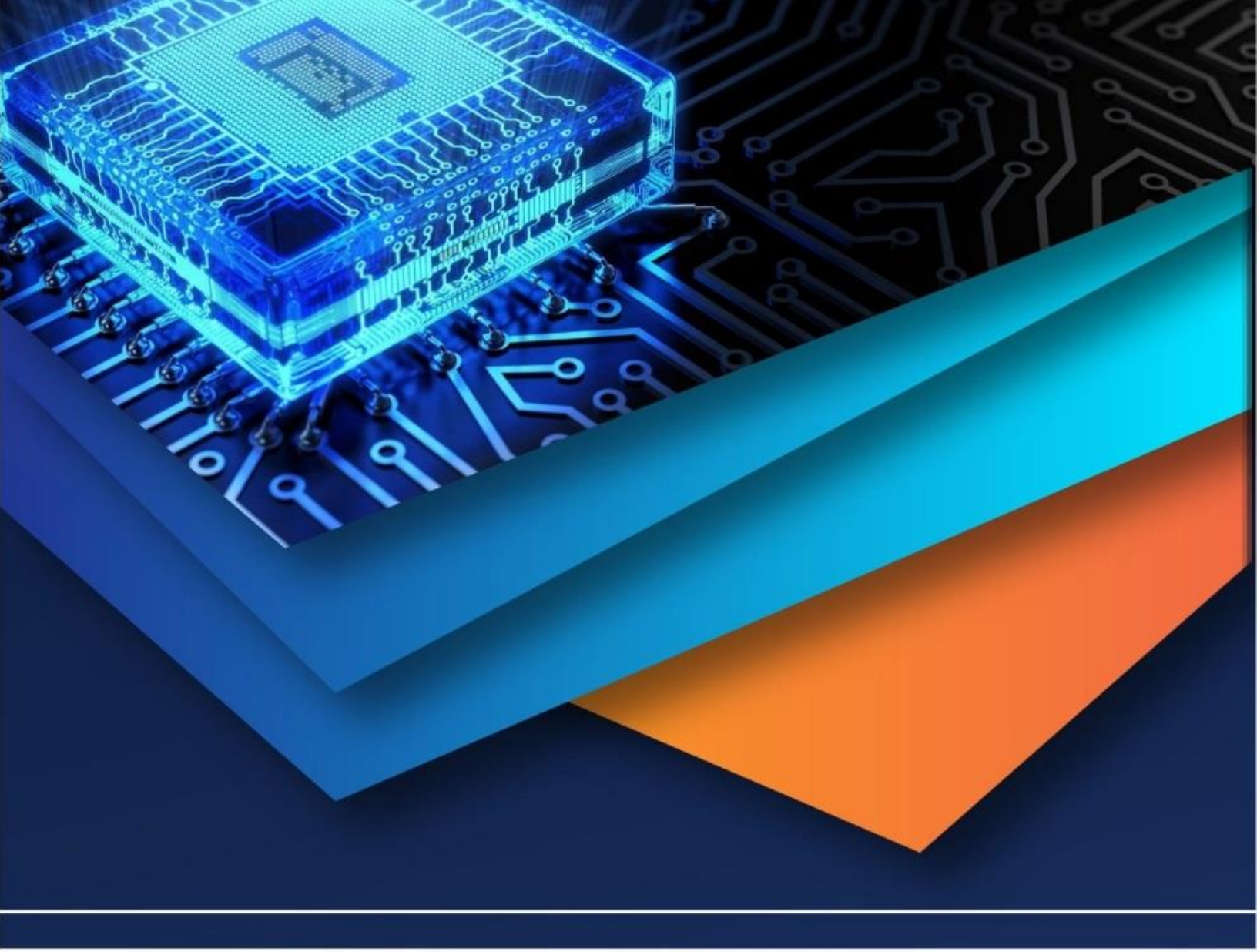

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