High-Tech ATM

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Abstract---Our project high-tech ATM is a small effort to do reduce the crime in the society. There are various prospect of security purpose like Catching a person using blocked ATM cards, Blocking a person using wrong password more than 3 times, detecting the wanted criminal and Informing the nearest police station when crime is detected. This can be achieved by designing a system consisting of password system, card detection system, camera surveillance and communication system. In our project we have decided to use a controller, image processing and GSM module to meet the requirement.

Keywords: ATM security, Face detection, authorized access, crime detection and prevention.

I. Introduction

In today's advancing world along with the technologies the crime has also advanced severely. So it is very necessary to find ways to restrict such crimes. Our project high-tech ATM is a small effort to do so. There are various prospect of security purpose in our project. They are as follows:-

1. Catches a person using blocked ATM cards.
2. Blocks a person using wrong password more than 3 times.
3. Detects the wanted criminal.
4. Informs the nearest police station when crime is detected.

This can be achieved by designing a system consisting of password system, card detection system, camera surveillance and communication system. In our project we have decided to use a controller, image processing and GSM module to meet the requirement. All the above prospects are covered under the bellow shown logic through a flow chart.

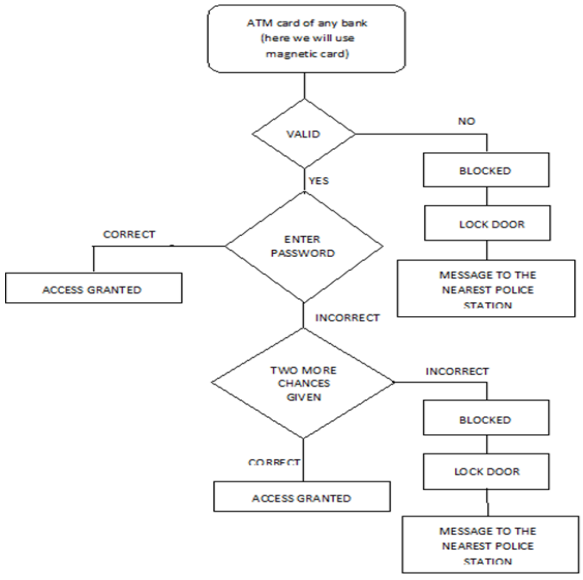

Fig.1: Authorized access (flow chart)

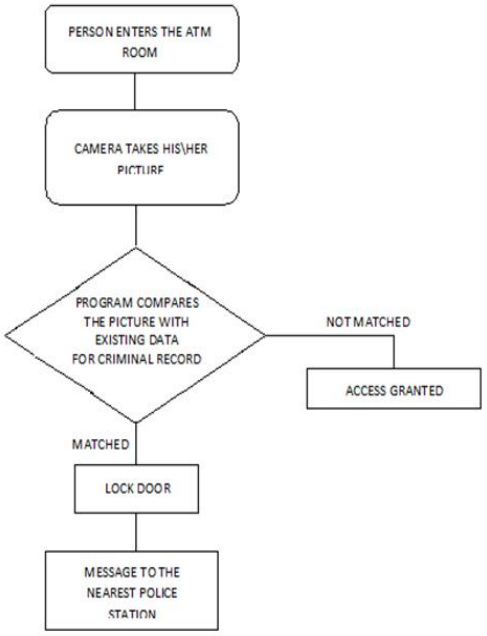

Fig.2: Face detection (flow chart)

II. Authorized Access

This section mainly consists of hardware section and its programming. In the hardware section it mainly consists of a microcontroller (Atmega16) along the following interfacings:-

1. LCD
2. Keypad
3. RFID
4. GSM module.
5. Lock assembly.

ATmega16:

We are using the ATmega16 microcontroller of the AVR family IC in this project. Now a question arise Why AVR?

AVR is faster and more powerful than 8051, yet reasonably cheaper and in-circuit programmable. Most AVR development software is free as these are open source. Moreover, discussions and tutorials on the AVR family are available on the internet. ATmega16 is a high performance, low power 8-bit AVR microcontroller. It has 16 kb of in system self-programmable flash, 1 kb of internal SRAM, 512 bytes of EEPROM, 32 x 8 general purpose working resistors and JTAG interface (which supports programming of flash, EEPROM, fuse and lock bits).

In the interfacing section as listed above we are using them along the controller in our hardware section. For this we had taken the help of "The 8051 microcontroller and embedded system using assembly and C" [2] and "The 8051 microcontroller" [3].

All the programming is done through AVR studio in C language.

III. FACE DETECTION

During our literature survey we had come across many methods of face detection. But we found the method using HMM and SVD [1] the most efficient for this task.

We have used MATLAB for the simulation of face detection part. The codes for the same are very simple and can easily be understood [4].

The simple explanation of this section is that we have a database created initially and whenever a person enters the ATM room the camera there captures his/her image and compares with the database. If this matches with the criminal record the door automatically locks and a message is send to the nearest police station. In this way it reduces the crime and helps the police in a great manner.

Here the HMM stands for Hidden Markov model. Hidden Markov model is simple tool for determining the past and future of an event in a sequence of event. More than that it can answer what is occurrence probability of a sequence of event. It is used here to extract features from the face.

Then SVD Singular value decomposition is used to reduce the extracted values to a lesser number (more nearer to one). We obtain three values of matrix at the end of this step. Finally the quantization is used to reduce these three values to one and the whole detailed explanation is in the book Face reorganization with Hidden Markov model in MATLAB [1].

IV. MERITS

- A very efficient security system.
- Helps the security personal by a great means.
- With face detection included this system would bring a revolution in the world of security.
- Crime would be reduced to a great effect.
- Bank customers would feel more secure in terms of their ATM transaction and stolen cards.

V. DEMERITS

- Somewhat costly than the present systems availing.
- The criminal can break the door when blocked inside; leading to violence. Remedy to this is use of bulletproof glasses in door but that too makes the system costly.
- The whole system is based on accuracy of every single parameter if any of them doesn't work coordinately then the whole system declines from its regular performance.

VI. CONCLUSION

Our project would bring a revolution in the world of ATM security as well as would help a great deal in catching the criminals of the society. Thus our project is a boost to the safety and security of the people and would help the policemen to reduce the crime to a large instinct and built a safe and healthy environment all around where there is no fear of ATM card being stolen along with this ease the work of policemen. This is our aim and dream also.

REFERENCES

[1]. OmidSakhi, "Face reorganization with Hidden markov model in MATLAB", 2013
[2]. Mazidi and Mazidi, "The 8051 microcontroller and embedded system using assembly and C", Pearson publication, 2013
[3]. Kenneth Aayla, "The 8051 microcontoller", 2009
[4]. URL: http://www.mathworks.com/matlabcentral/file exchange/37351-face-recognition-software/all_files.

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