

# ATM PIN Security System Using Haptic Feedback

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**Abstract:** Nowadays ATM theft has been increased a lot, this includes recording the pin number by using camera while entering it. This System is used to prevent ATM shoulder peaking attacks in pin entry access systems using novel methods. Common PIN-entry schemes are vulnerable to observation attacks. To enhance the resistance to observation attacks, some observation attacks resistant PIN-entry schemes for mobile devices based on audios and/or haptics have been proposed. However, none of existing observation attacks resistant PIN-entry schemes can achieve both good security and high usability. Herein, we propose a new observation attacks resistant PIN-entry scheme, Loc-HapPIN, for touchscreen devices providing localized haptic feedback. By using the technology of localized haptic feedback, the usability and the resistance to observation attacks are improved. Furthermore, the user can choose the efficiency-security setting suitable for him. One Time Password system is available to prevent shoulder surfing attacks that sends OTP to any registered mobile GSM device. We are going to enhance resistance to observation attacks, the proposed system uses a haptic feedback system.

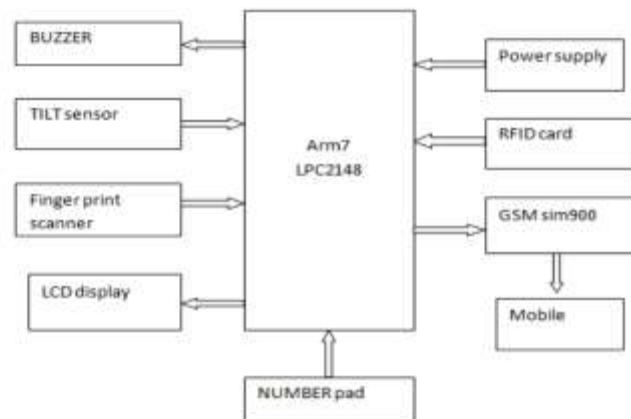
**IndexTerms - Pic, Vibrator Motor, GSM Module, MP Lab, Proteus**

## I. INTRODUCTION

ATM is a machine which is used to dispense and deposit money. ATM processor is an Automatic Teller Machine, i.e. a machine that, when you insert a card, gives you means an exchange. There are two types of ATM machine. The First type is to drop money by the user and get the receipt based on the account. The second type is more advanced in which we will be able to credit card payment, deposit money and user can get information about the account. ATM is used by many people to drop money. If cash is required to user they can get money with the help of ATM machine, which is near to the user location. ATM machine has two input and four outputs as per user needs. Each ATM card has unique number is called as PIN number. If the card is identified, then machine will ask user to enter the PIN number. ATM machine will start the process of transaction if PIN number is correct, if not transaction process will be blocked. Each user can change their PIN number, so that it is easy to remember. Output of the ATM machine is Display screen, Receipt printer Cash dispenser, Speakers. But we propose a new observation attacks resistant PIN-entry scheme, Loc-HapPIN, for touchscreen devices/keypad providing localized haptic feedback. By using the technology of localized haptic feedback, the usability and the resistance to observation attacks will be improved.

## II. EXISTING SYSTEM

Security has always been a major concern and securing the integrity of it is the major goal of all organization. When talking about ATM machines we are mainly concerned with Physical security which aims at ensuring Access control, Identification and Authentication. Access control is another consideration of Information System security to confirm the identity of individual so that only authorized entity is accessible to the system. With the development of banking technology the way of banking has changed. In this proposed system we are securing the ATM user transaction by using OTP and biometric.

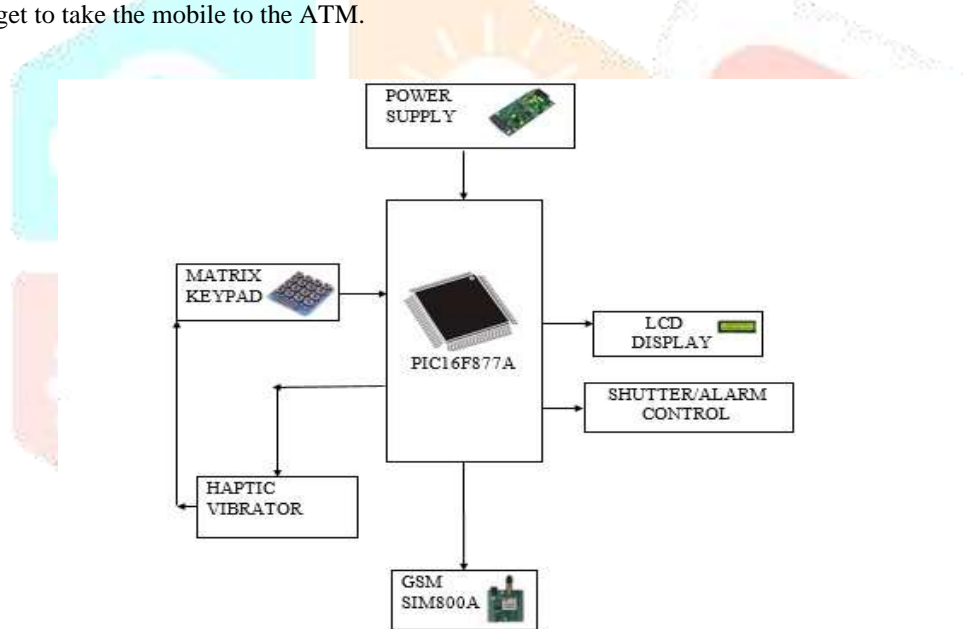


**Fig. 1. Block Diagram of Existing System**

Here we are using RFID card as ATM card, amount and OTP is entered by number pad, OTP is sent to the registered mobile number by using GSM, a finger print scanner is used for biometric security, and the output of the overall system is displayed on the LCD. In addition with this a tilt sensor is used for the security of the ATM machine, if anybody try to steal the machine then there will be tilting which is sensed by tilt sensor interfaced to the ATM machine and is indicated by the buzzer alert. All these sensors are connected to the ARM7 LPC2148 microcontroller.

### III. PROPOSED SYSTEM

We propose a new observation attacks resistant PIN-entry scheme, Loc-HapPIN, for touchscreen devices/keypad providing localized haptic feedback. By using the technology of localized haptic feedback, the usability and the resistance to observation attacks will be improved. Common PIN-entry schemes are vulnerable to observation attacks. To enhance the resistance to observation attacks, some observation attacks resistant PIN-entry schemes for mobile devices based on audios and/or haptics have been proposed. However, none of existing observation attacks resistant PIN-entry schemes can achieve both good security and high usability. Herein, we propose a new observation attacks resistant PIN-entry scheme, Loc-HapPIN, for touchscreen devices providing localized haptic feedback. By using the technology of localized haptic feedback, the usability and the resistance to observation attacks are improved. Furthermore, the user can choose the efficiency-security setting suitable for him. Fig c shows the content that involved in the proposed system and its functions. Nowadays the ATM theft has been increased a lot. These theft can be occurred by seeing the password while entering the pin by using camera and storing the number while card is swiped, by merging these two i.e., the card number and the password the theft has been occurred. To overcome the theft in ATM many methods have been introduced, these includes GSM using OTP.OTP method is nothing but the person receives one time password once the card is swiped at the ATM, so that the person can enter the received one time password to access the transaction. The above method has some disadvantages like there may any problem with the mobile or the signal i.e., the person may not receive the one time password at that time or the person may forget to take the mobile to the ATM.



**Fig. 2. Block Diagram of Proposed System**

Therefore we are proposing a new method to prevent the ATM theft, our method includes haptic feedback. Haptic in the sense is nothing but the vibrator that is used in the keypad of the ATM machine. Once the card is swiped, the person has to touch the check alert button that is to be included in our project, once the check alert button is pressed the person will receive vibration on the keypad. For e.g. the person's pin is 1234 say and if it vibrates 3 times we have to add that 3 with the first pin number i.e., 1 so 4 is your first pin number at that time and when we press the check alert button another time keypad will vibrate again say it vibrates 2 times so add this 2 with your second pin number i.e., 2 so your second pin number is 4. In this way the person has to add the original pin number with the received vibrations. The vibrations are generated randomly so the original password is the same and his/her password will be changed based on the vibrations at the time of swiping of the Card in this method the ATM theft can be reduced because the person can feel the vibrations so that it cannot be seen and also each and every time the vibrations are generated randomly so the ATM theft cannot be occurred anymore.

#### IV. EMBEDDED SYSTEM

An embedded system is a combination of computer hardware and software, either as fixed in capability or programmable, that is specifically designed for a Particular function an embedded system usually does not look like a computer, often there is no keyboard or monitor or mouse. But like any computer it has a processor and software, input and output. The word embedded means it is built into the system.

These systems are playing very important roles in day to day life, even though they might not necessarily be visible. Some of the embedded systems used are controlling the menu system on television or any other device with some amount of intelligence built-in. key components of an embedded system are Processor, Memory and Peripherals.

#### *Pic Microcontroller*

A microcontroller is a complete computer system on a single chip. It is more than Just a microprocessor: It also contains a Read-Only Memory (ROM), a Read-Write Memory (RAM), some input/output ports, and some peripherals, such as, Counters/timers, analog-to-digital converters, digital-to-analog converters, and serial Communication ports. The PIC contains an ALU, which does arithmetic and logic operations, the RAM, which is also called the “register-file”, the program EEPROM (Flash Memory), the data EEPROM, and the “W” register. The “W” register is not a part of the register-file but is a stand-alone, working register (also called an “accumulator”). The ALU, the RAM, the “W” register, and the data EEPROM each manipulate And hold 8-bit-wide data, which ranges in value from zero to 255 (or, in hexadecimal, From 0x00 to 0xFF). The program EEPROM (Flash Memory) works with 14-bit-wide words and contains each of the user’s instructions.

#### *Vibrator Motor*

LRA stands for Linear Resonant Actuator. It is comprised of a magnetic mass on a spring and a voice coil. When a current flows through the voice coil, a force is generated due to the magnetic field. This force causes the mass to displace. The repeated displacement of the mass produces a varying f Vibrating Motor is essentially a motor that is improperly balanced. In other words, there is an off-centered weight attached to the motor's rotational shaft that causes the motor to wobble. The amount of wobble can be changed by the amount of weight that you attach, the weight's distance from the shaft, and the speed at which the motor spins. This type of motor can be used affixed to all kinds of objects, which will cause them to vibrate and move freely about. This is a quick and dirty way to get a simple bot to move about, but not exactly the most elegant. Vibrating motors can be found inside cell phones, pagers, gaming controllers, and personal massagers. During rotation, the eccentric weights mounted on the two shaft ends generate a circular vibration, causing a vibrating motion to be impressed onto the components coupled to the motor base - such as trough conveyors or screening machines. Two counter-rotating vibrating motors generate directed vibrations. The vibrating motors are selected according to the required centrifugal force and the desired speed.

#### *GSM Module*

GSM (Global System for Mobile communications) is the most popular standard for mobile phones in the world. Its promoter, the GSM Association, estimates that 82% of the global mobile market uses the standard. GSM is used by over 3 billion people across more than 212 countries and territories. Its ubiquity makes international roaming very common between mobile phone operators, enabling subscribers to use their phones in many parts of the world. GSM differs from its predecessors in that both signalling and speech channels are digital, and thus is considered a second generation (2G) mobile phone system. This has also meant that data communication was easy to build into the system.



**Fig. 3. GSM Module**

The ubiquity of the GSM standard has been an advantage to both consumers (who benefit from the ability to roam and switch carriers without switching phones) and also to network operators (who can choose equipment from any of the many vendors implementing GSM. GSM also pioneered a low-cost (to the network carrier) alternative to voice calls, the Short message service (SMS, also called "text messaging"), which is now supported on other mobile standards as well. Another advantage is that the standard includes one worldwide Emergency telephone number, this makes it easier for international travellers to connect to emergency services without knowing the local emergency number.

#### IV. CONCLUSION

The Haptic feedback system implemented was found to be feasible and cost effective for ATM pin security. This Haptic feedback system allows to produce vibrations which is used to secure our ATM pin number. The main intension of this project is to prevent entering the original pin number at the ATM thereby securing the ATM pin and reducing the ATM theft.

#### V. FUTURE WORK

Thus in this implemented system the vibrations are generated randomly using the temperature sensor values, the number of vibrations generated will be added to the original ATM pin number. So that each and every time the pin number is changed, even though the pin is recorded using camera it won't be the pin for next time since vibrations are generated randomly. Therefore this system provides efficient and secured access of ATM.

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