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ATM Pin Security Scheme using Concentrate Haptic Feedback

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ABSTRACT: Authentication based on password is used largely in applications for computer security and privacy. With web applications and mobile apps piling up, people can access these applications anytime and anywhere with various devices. This evolution brings great convenience but also increases the probability of exposing passwords to shoulder surfing attacks. Attackers can observe directly or use external recording devices to collect user's credentials. To overcome this problem, 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 efficient-security setting which is suitable for him.

I. INTRODUCTION

Shoulder surfing is an identity theft technique that relies on obtaining the password of the user either by visual observation or by recording the password entry process. If the password is deciphered by the imposter, security of the device may be compromised. Therefore, authentication systems should be robust, secure, and user friendly. There are three common forms of user authentication, namely identification by knowledge, possession, and property. Identification by knowledge uses the information known only to the user (e.g. password entry), whereas, possession involves techniques using objects, specific to the user (e.g. tokens, smart cards) and property-based. Verification refers to the exploitation of user specific property (e.g. biometrics) for validation. In object-based authentication, requirement of objects specific to individual users, makes the login process difficult if the objects are tampered or lost. On the other hand, biometric authentication needs special hardware. In contrast to the above two methods, establishing the identity of a user via password is more popular.

In this paper, we present a secure authentication system named haptic feedback that protects user from becoming victim of shoulder surfing attack. A password is randomly generated from the haptic feedback and will be useless after the session terminates. This haptic feedback system provides better security against shoulder surfing attacks, since user use dynamic password rather than using same password everytime

II. RELATED WORK

To enhance the resistance to observation attacks, audios have been used to transmit secret information from the remote system to the user. In 2011, Bianchi proposed an audio based observation attacks resistant 4-digit PIN-entry scheme using earphones, the audio version of Phone Lock. However, as the user's operation burden is rather high, its usability is insufficient. In the same year, an audio based observation attacks resistant 4-digit PIN-entry scheme using earphones, Spinlock was proposed. The user has to spin the disc and count the cues to login the system. However, the average login time of Spinlock is rather long and the resistance of Spinlock to observation attacks is weak.

Many graphical password schemes are proposed with an objective to save memory, work fast and less prone to shoulder surfing attacks. One of the early graphical authentication schemes is proposed by Dhamija and Perrig. Their technique is based on hash visualization where the server needs to store the seeds of the portfolio images of all users in plaintext. Also, random picture selection from a huge database is a tedious process and schemes have been proposed to



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efficiently store and select images . In a technique called “Passface” , the user is asked to select four images of human faces. The authentication phase shows 9 faces out of which eight are decoy and one is the previously chosen images out of four. The user recognizes and clicks anywhere on the known face. This technique is extensively memorable over long intervals. However, the major drawback of such a scheme is a natural inclination to choose faces based on gender, race or cultural inclinations. This makes the password somewhat predictable. one time password system is available to prevent shoulder surfing attacks that sends OTP to any registered mobile GSM device.

III. THE PROPOSED SCHEME

The major common drawback of existing observation attacks resistant PIN-entry schemes employing audios is that the user has to carry an earphone with him/her. Audio-PES includes the registration phase and the login phase, which makes the usability of the system more complex. Graphical interface includes both the Graphical and Text- based images interface for identification. imposter can crack the password if he records the images for more than 10 times. This makes the system insecure. The user must always have access to the registered mobile GSM device else he will be locked out of the premises and it takes too much time to access a resource.

Our proposed system overcomes the above drawback by using haptic feedback method. In this system, haptic vibrator is fixed under the 4x4 matrix keypad. Based on body temperature of the user ,the temperature sensor produce random vibrations from (1-5) counts. Let us consider the 4 digit personal identification number of the user as $X_1X_2X_3X_4$ (Base pin). Sensed vibration is added with base pin to get a secured pin.

Base pin	$X_1X_2X_3X_4$
	1 4 5 9
Vibration	2 4 3 1
New pin	3 8 8 0

When the imposter use the same pin number(new pin)of the user .By using GSM an alert message is sent to the police and the ATM shutter gets closed. In addition to that the shutter is opened only when the police press the police open button.

IV. BRIEF DESCRIPTION

4.1. Proteus software

Proteus is a simulation and design software tool developed by Labcenter Electronics for Electrical and Electronic circuit design. It also possess 2D CAD drawing feature. It deserves to bear the tagline “From concept to completion”.

About Proteus

It is a software suite containing schematic, simulation as well as PCB designing.

ISIS is the software used to draw schematics and simulate the circuits in real time. The simulation allows human access during run time, thus providing real time simulation.

ARES is used for PCB designing. It has the feature of viewing output in 3D view of the designed PCB along with components.

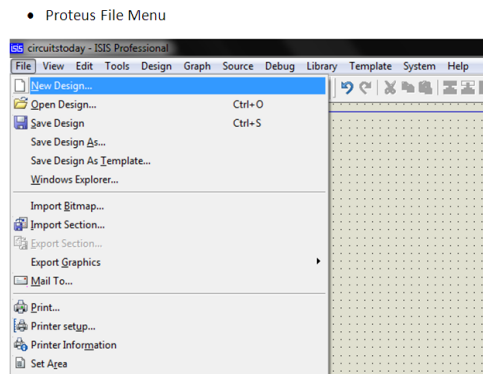


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The designer can also develop 2D drawings for the product

4.2.Hi-Tech C compiler

The HI-TECH C Compiler for PIC10/12/16 MCUs (Lite mode) is a freeware compiler. It supports all PIC10, PIC12 and PIC16 series devices.

HI-TECH C for Z80/Z180 offers a complete ANSI C embedded compiler package with a full development system for language C and assembler. HI-TECH C supports the 64K memory model for the base Z80, plus the expanded memory on the Z180 and 64180, or even user-defined banked memory on any other Z80 device, allowing a megabyte of program memory. Interrupt functions can be defined entirely in C, including mode 2 vectors, and I/O ports are mapped as C variables with the port qualifier.

Overview

- Fully compatible with Microchip's MPLAB ID
- Fully ANSI-compliant
- Includes Library source - for standard libraries and sample code for I/O drivers
- Includes macro assembler, linker, preprocessor, and one-step driver
- Runs on 32/64-bit Windows, Linux and Mac OS X

Compiler Features

- ANSI C, supporting all standard data types
- Unlimited number of source files
- Multiple optimization levels
- Comprehensive library with source code
- Floating point support (32-bit)
- Mixed C and assembler programming
- Listings showing generated assembler

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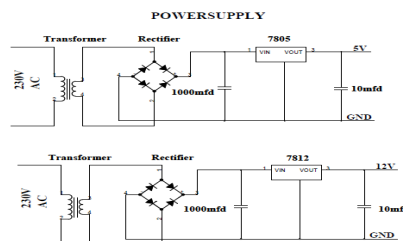
- Optimizing assembler
- Full linker, with overlaying of vocal variables to minimize RAM usage
- Remote source-level debugger for low-cost in-target debugging included at no extra cost

Layout



4.3.POWER SUPPLY

The ac voltage, typically 220V rms, is connected to a transformer, which steps that ac voltage down to the level of the desired dc output. A diode rectifier then provides a full-wave rectified voltage that is initially filtered by a simple capacitor filter to produce a dc voltage. This resulting dc voltage usually has some ripple or ac voltage variation.



A regulator circuit removes the ripples and also remains the same dc value even if the input dc voltage varies, or the load connected to the output dc voltage changes. This voltage regulation is usually obtained using one of the popular voltage regulator IC units.

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4.4. PIC MICRO CONTROLLER

The microcontroller that has been used for this project is from PIC series. PIC microcontroller is the first RISC based microcontroller fabricated in CMOS (complimentary metal oxide semiconductor) that uses separate bus for instruction and data allowing simultaneous access of program and data memory.

The main advantage of CMOS and RISC combination is low power consumption resulting in a very small chip size with a small pin count. The main advantage of CMOS is that it has immunity to noise than other fabrication techniques

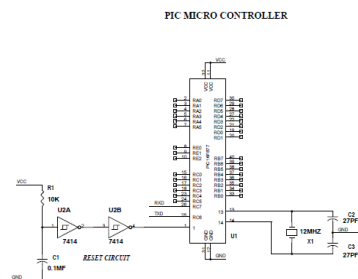
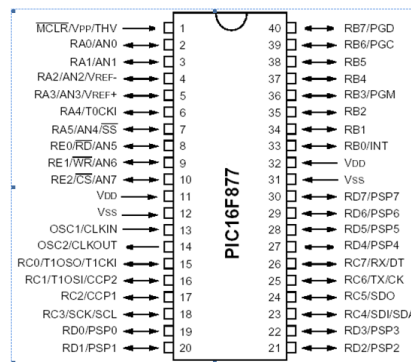


FIG 2.2 PIN DIAGRAM OF PIC 16F877



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4.5. VIBRATOR MOTOR

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.

WORKING PRINCIPLE

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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.

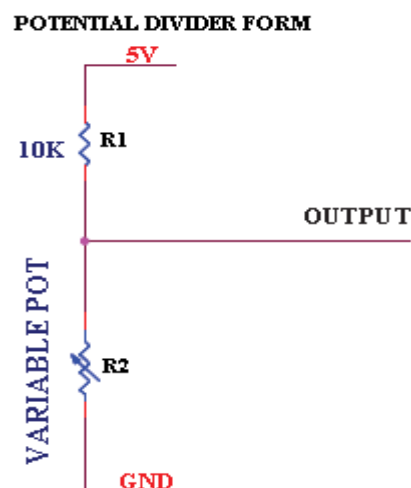
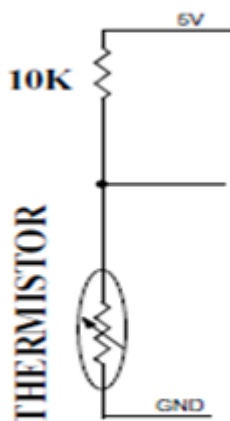
Applications

Discharge Aids

Vibrators

4.6. Temperature measurement Using Thermistor

Schematic diagram :



Schematic Explanation:

In this circuit the thermistor is used to measure the temperature. Thermistor is nothing but temperature sensitive resistor. There are two type of thermistor available such as positive temperature co-efficient and negative temperature co- efficient. Here we are using negative temperature co-efficient in which the resistance value is decreased when the temperature is increased.

Potential divider form:

$$V_{out} = V_{in} \frac{R_2}{(R_1 + R_2)}$$

If the R1 and R2 value is equal means the output is half of the Vcc supply. In this circuit output is a variable one. So the output is depending upon the R2 resistance value.

Resistance value will be varied depend upon the Temperature level. Temperature varied means the resistance value also varied. If resistance value increased means output also increased. The resistance value and output is a directly proportional one. Then the final voltage is given to ADC for convert the analog signal to digital signal. Then the corresponding digital signal is taken to process in microcontroller.

International Journal of Innovative Research in Computer and Communication Engineering

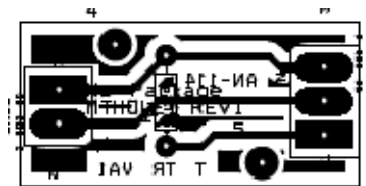
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Vol. 7, Issue 3, March 2019

The ADC value will increase if the temperature increased. We can measure the temperature only with the help of any controller or processor.

PCB LAYOUT :



THERMISTOR :

A **thermistor** is a type of resistor used to measure temperature changes, relying on the change in its resistance with changing temperature. Thermistor is a combination of the words thermal and resistor. If we assume that the relationship between resistance and temperature is linear (i.e. we make a first-order approximation), then we can say that:

$$\Delta R = k\Delta T$$

Where

ΔR = change in resistance

ΔT = change in temperature

k = first-order temperature coefficient of resistance

Thermistors can be classified into two types depending on the sign of k . If k is positive, the resistance increases with increasing temperature, and the device is called a positive temperature coefficient (**PTC**) thermistor, **Posistor**. If k is negative, the resistance decreases with increasing temperature, and the device is called a negative temperature coefficient (**NTC**) thermistor. Resistors that are not thermistors are designed to have the smallest possible k , so that their resistance remains almost constant over a wide temperature range.



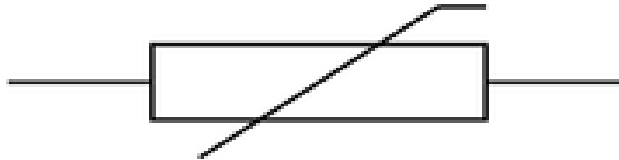
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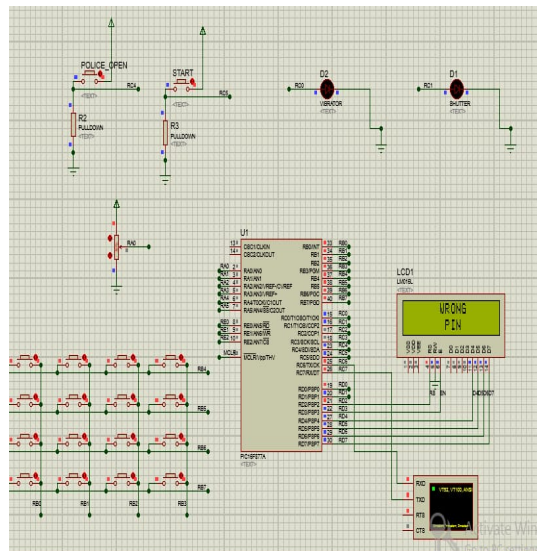
Vol. 7, Issue 3, March 2019

Symbol:

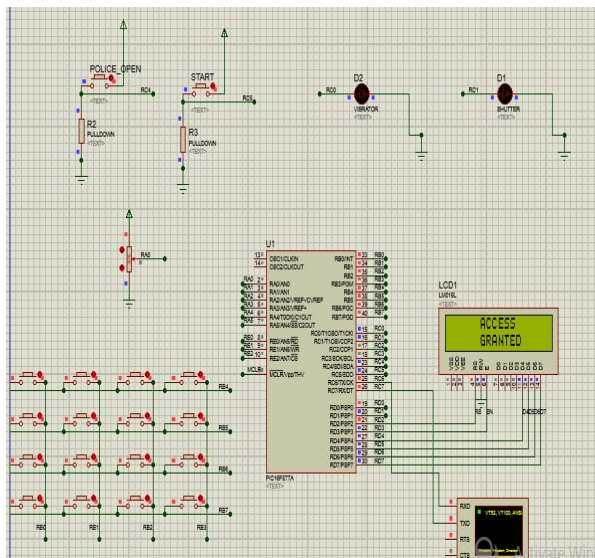


V. SIMULATION OUTPUT

5.1. WRONG PIN



5.2. ACCESS GRANTED



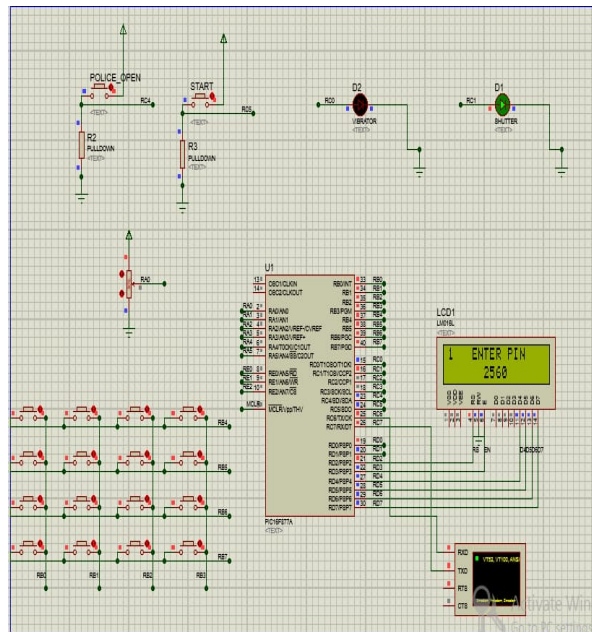
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Website: www.ijircce.com

Vol. 7, Issue 3, March 2019

5.3. ENTER THE PIN



VI. CONCLUSION

In this paper we have proposed an observation attack resistant by haptic feedback scheme with enhanced security and usability. Using traditional textual password or pin method user need to type the password to authenticate themselves and these password can be revealed easily if someone peeks over shoulder or uses video recording devices such as hidden cameras. This drawbacks can be overcome by this proposed system by generating new password everytime.

REFERENCES

- [1] S. Sood, A. Sarje, and K. Singh, "Cryptanalysis of password authentication schemes: Current status and key issues," in *Methods and Models in Computer Science*, 2009. ICM2CS 2009. Proceeding of International Conference on, Dec 2009, pp. 1–7.
- [2] S. Gurav, L. Gawade, P. Rane, and N. Khochare, "Graphical password authentication: Cloud securing scheme," in *Electronic Systems, Signal Processing and Computing Technologies (ICESC)*, 2014 International Conference on, Jan 2014, pp. 479–483.
- [3] A. D. Luca, K. Hertzschuch, and H. Hussmann, "ColorPIN: Securing PIN entry through indirect input," *Proc. CHI 2010*, 2010, pp. 1103–1106.
- [4] M. K. Lee, "Security notions and advanced method for human shoulder-surfing resistant PIN-entry," *IEEE Transactions on Information Forensics and Security*, vol. 9, no. 4, pp. 695–708, April 2014.
- [5] Shah, Amish, et al. "Shoulder-surfing Resistant Graphical Password System." *Procedia Computer Science* 45, 2015.
- [6] Dhamija, Rachna, and Adrian Perrig. "Deja Vu-A User Study: Using Images for Authentication." *USENIX Security Symposium*. Vol. 9. 2000.
- [7] Brostoff, Sacha, and M. Angela Sasse. "Are Passfaces more usable than passwords? A field trial investigation." *People and Computers XIV: Usability or Else!*. Springer, pp 405–424. London, 2000.
- [8] Jansen, Wayne. "Authenticating mobile device users through image selection." *WIT Transactions on Information and Communication Technologies*, 2004.