

Review On-A Knock Based Security System

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Abstract:- Security is prime concern in our day-to-day life. Everyone wants to be as much as secure as to be possible. An access control systems forms a vital link in a security chain. Door lock is use in doors to lock the door; it is a security strategy use for avoiding opening the door. Only rightful person can open the door. The arduino controller based digital lock is an access control system that allows only authorized persons to access a restricted area. This system is best suitable for corporate offices, ATMs and home security. A knock based security system (KBSS) system using a Piezo sensor and ARDUINO

Leonardo. The ARDUINO Leonardo controls the system, the expected outcome includes:

1. Locking and Unlocking of the door through patterns based on knocks.
2. The unlocking of the door through a mobile phone incase if user forgets the pattern using the Bluetooth module.
3. Automatic locking of the door for 30min if intrusion is detected and an alert is sent to the authorized user.

After successfully authentication of a user through knock, the door gets unlocked based on vibrations and patterns.

Keywords-Knock, ARDUINO, Security and Piezo Sensor.

I. Introduction

There are many type of door locks currently use in the world. Key door lock is the most common one among them. In high security systems it uses electronic door locks. Electronic door lock is locking device which operate with the means of electricity. More often electronic door locks are connected to an access control. The advantages of an electric lock connected to an access control system include: key control, where keys can be added and removed without re-keying the lock cylinder; fine access control, where time and place are factors; and transaction logging, where activity is recorded. Numerical codes, passwords, passphrase, Security tokens, biometrics, Finger prints, Face recognition etc. are some types of electronic locks.

Key door lock is the most common door lock which is used in homes and many other buildings. Mostly one Key is use for one door so when many users use door, problems may occur. And also if the keys can be duplicated. If the key is lost door can't be opened by the user and it can be found by someone else. And also door opening should be very simple and user doesn't like to spend more time in front of the door opening the door and face recognition, eye detecting door lock also have some problems. Passcode door locks have security problems in if someone can fetch the password by looking user typing the password.

About the above mentioned problem, to find a solution and a way to improve the security. So knock detecting door lock is the idea. Here, door user can assign specific knocking pattern to the door lock (can be music pattern of a song or a simple pattern) so only the person who know the pattern and who can knock that pattern in certain accuracy can open the door. So only having one key trouble may not occur with this door lock. Because any user who uses the door should know the knocking pattern and they can open the door any time they want. Further development and higher password security having a password or face recognition and also connecting the door lock with a mobile phone via Bluetooth. It increases the security and if user forgot the knock pattern only the specific user is able to connect the door lock.

II. Literature Survey

[1] Avishek Ahmed, 2 Tanvir Ahmed, 3 Md. Samawat Ullah, 4 Md. Manirul Islam, "Controlling and securing a Digital Home using Multiple Sensor Based Perception system Integrated with Mobile and Voice technology", they have designed and developed a very efficient Digital home system. Fully Controlled Digital Home is no more a Luxury. We built a feature-rich Digital Home System (DHS). Digital Home System is combination of automated services i.e. Electronic Device Controller, IR Security System, Web Desktop, Remote Video Surveillance System and Virtual Mobile by which we can control our home by avoiding old

manual processes e.g. our physical presence at home is optional.

[2]Nikhil Agarwal, Department of EC Engineering MIT, Manipal,” Microcontroller based Home Security System with Remote Monitoring”, proposes construction of a micro-controller based automated Home Security System. The door lock is password protected with an LED based resistive screen input panel which operates by detecting difference in light intensity captured by the photo diode which is emitted by surrounding red LEDs and reflected by the finger.

[3] Minal Nikose, Pratibha Mishra, Avinash Agrawal, ”A Review On Industrial Automation By Zigbee Based Wireless Remote Controller”, Proper use of wireless sensor networks (WSNs) can lower the rate of catastrophic failures, and increase the efficiency and productivity of industrial operations. Diversification of remote control mode is the inevitable trend of development of smart appliances. This paper proposes a review on remote control system of smart appliances based on Zigbee wireless sensor network. Status of the home appliances can be queried and controlled through the remote controller. The proposed work presents the design and implementation of a novel wireless sensor network based home security system with a modular self-reconfigurable remote controller.

[4] Jayashri Bangali, 2Arvind Shaligram,” Energy efficient Smart home based on Wireless Sensor Network using LabVIEW”, Smart home is a house that uses technology to monitor the environment with the help of various sensors, control the electrical appliances and communicate the outer world. Now-a-days the demand for home automation systems in homes and offices are invariably increasing. In this paper we present the design and implementation of a smart home based on LabVIEW using wireless sensor network system. The system can monitor the temperature, light, fire & burglar alarm of the house and have infrared sensor to guarantees the family security. The monitored data is automatically stored into an excel file. The system can be connected to internet to monitor the security of home from anywhere in the world.

[5] Wuhan, Hubei,” A Remote Home Security System Based on Wireless Sensor Network and GSM Technology”, in this paper, a low-power consumption remote home security alarm system developed by applying WSN and GSM technology is presented. It can detect the theft and send alarm message remotely. The system software has the ability of collecting, wireless receiving and sending data, and can send a piece of alarm short message to the user’s mobile phone when some dangerous condition has been detected.

[6]N. Bharath Kumar, “Anti-Theft ATM Machine Using Vibration Detection Sensor”, this paper provides security system for ATM machines. Now a days there is no particular security system for ATM machines. The only security system provided at the ATM centers is ATM card detector near the doors. If the inserted card is authorized then the door will open automatically.

[7]Instrumentation and Measurement Technology Conference (I2MTC), 2012 IEEE International,” Sensor based home automation and security system”, presents the design and implementation details of this new home control and security system based on field programmable gate array (FPGA) The user here can interact directly with the system through a web-based interface over the Internet, while home appliances like air conditioners, lights, door locks and gates are remotely controlled through a user-friendly web page

[8]Rupinder Singh Brar, “ARDUINO Based industrial security system using piezo electric sensor.” Security is prime concern in our day-to-day life. Everyone wants to be as much as secure as to be possible. An access control systems forms a vital link in a security chain. The arduino controller based digital lock presented here is an access control system that allows only authorized persons to access a restricted area. This system is best suitable for corporate offices, ATMs and home security.

III. Proposed approach

When given input as door knock if it is correctly entered the door will open otherwise it is incorrectly entered three times, the code lock will switch to block mode. Whenever the door knock is incorrectly entered then an alert will be sent to the authorized user.

Having a secret knock to get let into a locked to turn into unlocked. It’s a tradition used in secret societies for hundreds, if not thousands of years. Here using a Piezo element to detect sound, what will allow us to use it as a knock sensor. Taking advantage of the processors capability to read analog signals through its ADC - analog to digital converter. These converters read a voltage value and transform it into a value encoded digitally. In the case of the Arduino boards, it transforms the voltage into a value in the range 0.1024. 0 represents 0volts, while 1024 represents 5volts at the input of one of the six analog pins.

IV. Tools for development and verification of the Device.

Software:

- AVR Studio 5 for Development of Program (Written in C)
- Extreme Burner
- ProgISP

Hardware:

- 1 Arduino Leonardo
- 1 5v Gear reduction motor.
- 1 Piezo sensor. You can use larger or smaller ones, smaller will be less sensitive.
- 1 SPST momentary pushbutton. (normally "off")

V. Proposed Model

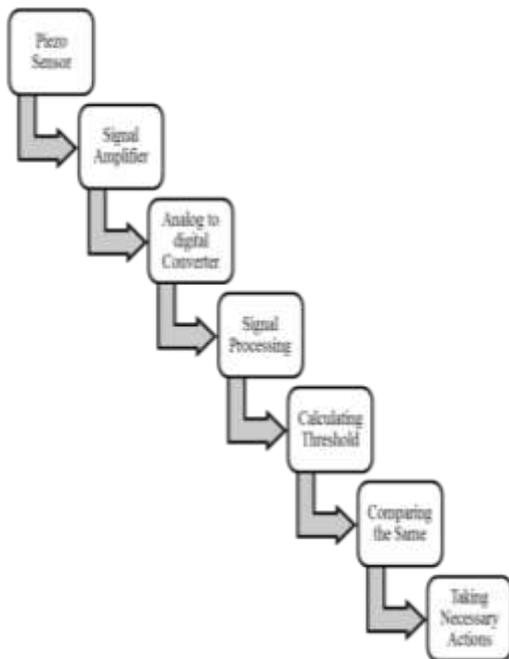


Figure 1.1 Design of Proposed System

VI. Methodology

Arduino

Arduino is a single-board microcontroller, intended to make the application of interactive objects or environments more accessible.^[1] The hardware consists of an open-source hardware board designed around an 8-bit Atmel AVR microcontroller, or a 32-bit Atmel ARM. Current models feature a USB interface, 6 analog input pins, as well as 14 digital I/O pins which allow the user to attach various extension boards.

Piezoelectric Sensor

A piezoelectric sensor is a device that uses the piezoelectric effect, to measure changes in pressure, acceleration, strain or force by converting them to an electrical charge. Piezoelectric sensors have proven to be versatile tools for the measurement of various processes.

Firstly identified the need of a door locking system that reacts to knocking. About how to get sound of knocking. Getting noise free sound, how to recognize patterns using suitable algorithms:

- Interfacing Piezo Sensor with Arduino.
- Getting Piezo Sensors reading in analog Form (Conversion of ADC).
- Checking against stored threshold with Current Reading.
- Acting as per results extracted from above steps.
- Sending SMS to the user using GSM Modem

Arduino programming are the thing in purpose of coming up with a better solution for the problem.

VII. Expected Outcome

A knock based security system (KBSS) system using a Piezo sensor and ARDUINO Leonardo. The ARDUINO leonardo controls the system, the expected outcome includes:

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VIII. References

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