Developing a Security for Home In Terms Of Locking Door Using Android OS

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Abstract: Now Technology has unfolded in each and every area of our lives. In existing era, everybody is having some kind of connectivity with science whether or not in shape of mobile, laptop computer or others. Here we are going to talk about the use of technological know-how infield of domestic security. In this system, we are the usage of ARDUINOUNO microcontroller board. This device is primarily based on door lock security with the assist of two excessive degree safety passwords and simultaneously the machine would be related with owner's mobile smartphone via GSM Module So that the proprietor ought toopen the door from far flung area also. When any licensed would attempt to open the door, he would have to enter two passwords when requested to do so. If he enters right passwords then the door will get open. But in case, he enters any of the two or both passwords incorrect then the gadget would get alert and ship a message to the proprietor to ask him whether or not it is he or now not and work accordingly. This device will be defend to Homes, Shops, Banks and establishments etc.

Keywords: Arduino Uno, GSM Module, Solenoid Lock, Home Security, Door Security

I. INTRODUCTION

In existing scenario, Security problems are the most mind boggling situations which have arose in the front of every individual. So, in this kind of situation, there ought to be some of the Smart options for them. Here in this paper, we a retrying to provide a very clever answer for the domestic security. This device protects the homes from unauthorized entry of any unknown and welcomes you and your visitors too (when you would no longer be existing at home). This device works on two excessive degree safety passwords. These passwords work as the key to authorization and solely the man or woman which is aware of these passwords would be in a position to liberate the door. This system should additionally be unlocked by means of the cell cell phone by using the owner. Whenever, there will be any unauthorized person then this gadget will ship a message to the proprietor about the situation. Right here, Arduino uno board will address the general working of the system as critical device. For the running of arduiono we are able to need to enter the popular password, which we want to use at the time of authentication, on the time of Programming of the board. Now the Solenoid lock should must be utilized in area of a mechanical lock simply so it is able to Be operated via capacity of the electrical indicators[1].

Brief messaging provider is used as the possibility of the high stage security password that is if the proprietor or person forgot the any of the 2 password then he may open the lock with the resource of the usage of their cell cell phone. To allow this carrier GSM module would moreover be used with a reason to be linked at as soon as to the Arduino uno[2]. But this SMS carrier may additionally be activated easiest if you entered a incorrect password. A few other gadgets alongside with temperature sensor, relay board of 12v etc additionally are used to numerous features stated on this paper. This device will take care of nearly the complete aspect related with safety inside the absence of the proprietor of the residence or banks.

Hardware Description

Inside the designing of this system numerous system have been used. This equipment Arduino Uno board, GSM module, Solenoid lock for the doorways, Relay board, Temperature sensor, Keypad etc. Now discussing about specifications of the equipments.

ARDUINO UNO BOARD

The Arduino Uno is a microcontroller board based on the ATmega328P microcontroller, which has an 8-bit resolution. It includes extra components to assist the ATmega328P microcontroller, such as a crystal oscillator, serial communication, voltage regulator, and so on. The Arduino Uno contains 14 digital input/output pins (including 6 PWM outputs), 6 analogue input pins, a USB connection, a Power barrel connector, an ICSP header, and a reset button

Table. Specification of the Arduino Uno Microcontroller [12].

Microcontroller	ATmega328P
Input Voltage (Recommended)	7-12 V
Input Voltage (Limit)	6-20V
Digital I/O Pins	14
PWM Digital I/O Pins	6
Analog Input Pins	6
DC Current per I/O Pin	20 mA
DC Current for 3.3V Pin	50 mA
Flash Memory	32 KB(ATmega328P) of which 0.5KB used by bootloader
SRAM	2 KB (ATmega328P)
EEPROM	1 KB (ATmega328P)
Clock Speed	16 MHz

GSM MODULE

Nuclear instruments are used to detect, measure, and identify radiation in a variety of ways. These instruments are primarily used for safety reasons, such as monitoring radiation levels and ensuring the safety of radiation workers, the general public, and the environment. An important feature that could help wireless connectivity can be added to these equipment to improve their capabilities. The combination of the continuous radiation monitoring will be possible thanks to sensors with wireless connectivity, particularly for wireless device setup, adjustment, or removal from remote places, as well as early radiation emergency alert query that meets the requirements of a certain application

GSM stands for "global system for mobile communication" and is a mobile communication modem (GSM).SIM800 is a quad-band GSM/GPRS module that works on GSM 850MHz, EGSM 900MHz, DCS 1800MHz, and PCS 1900MHz. It is designed for the global market.

1900MHz. SIM800 supports the GPRS coding schemes CS-1, CS-2, CS-3, and CS-4 and has GPRS multi-slot class 12/ class 10 (optional). SIM800 can suit practically all space needs in users' applications, such as M2M, smart phones, PDAs, and other mobile devices, with its small configuration of 24*24*3mm [4],[14]. The board's power source should be 12 volts and 1-2 amps.

SOLENOID DOOR LOCK

Solenoids are essentially electromagnets, consisting of a large coil of copper wire with an armature (a metal slug) in the centre. The slug is drawn into the centre of the coil when it is electrified. As a result, the solenoid can pull from one end. It runs on 12V DC (but it can run on 9-12 DC volts, however lower voltage results in weaker/slower performance). When triggered, it draws 650mA at 12V. It was created with a 1-10 second activation time in mind[9].

The Arduino board is connected to the solenoid lock through the Relay board. Here, a relay board is utilised to provide ac power to the solenoid, allowing it to create electromagnetism and perform its purpose[15].

TEMPERATURE SENSOR

This device detects temperature differences in the home or in institutions. In the event of a fire or other emergency, this device will detect the temperature. If a high level of temperature is detected in the residence, this device will promptly contact the owner [12].

The Arduino Uno board will be utilised in this system since the Arduino Uno IDE makes Arduino programming easier (integrated development Environment). All of these devices must now be linked to the Arduino, and the Arduino'sTx and Rx must be defined using programming. The GSM module and the relay board would be given power [6].

Methodology

The system is ready to use when the relevant connections have been made. To authenticate the owner of this machine, we use two high-level passwords. Two scenarios may emerge when the owner enters the two passwords using the keypad. If both passwords are correct in this circumstance, Arduino will compare them to the password entered during programming and send signals to the device

To open the solenoid lock. A 12V ac current will run through the copper coin when the solenoid lock receives the signal, causing magnetism to unlock the lock. After that, the door lock will be unlocked immediately, allowing the owner to enter the residence.

The Arduino Uno board will send a signal to the GSM module if any of the two passwords, or both, are incorrect. Now, when GSM receives a signal from Arduino, it will send a message to the owner's cell number specified in the programming, asking him "is it he or not"[13]. The door will open if the answer is YES, indicating that the person is the

owner. If he says no, the system will send him another message asking him if he wants to call the cops.And will follow the owner's advice by responding to the message.
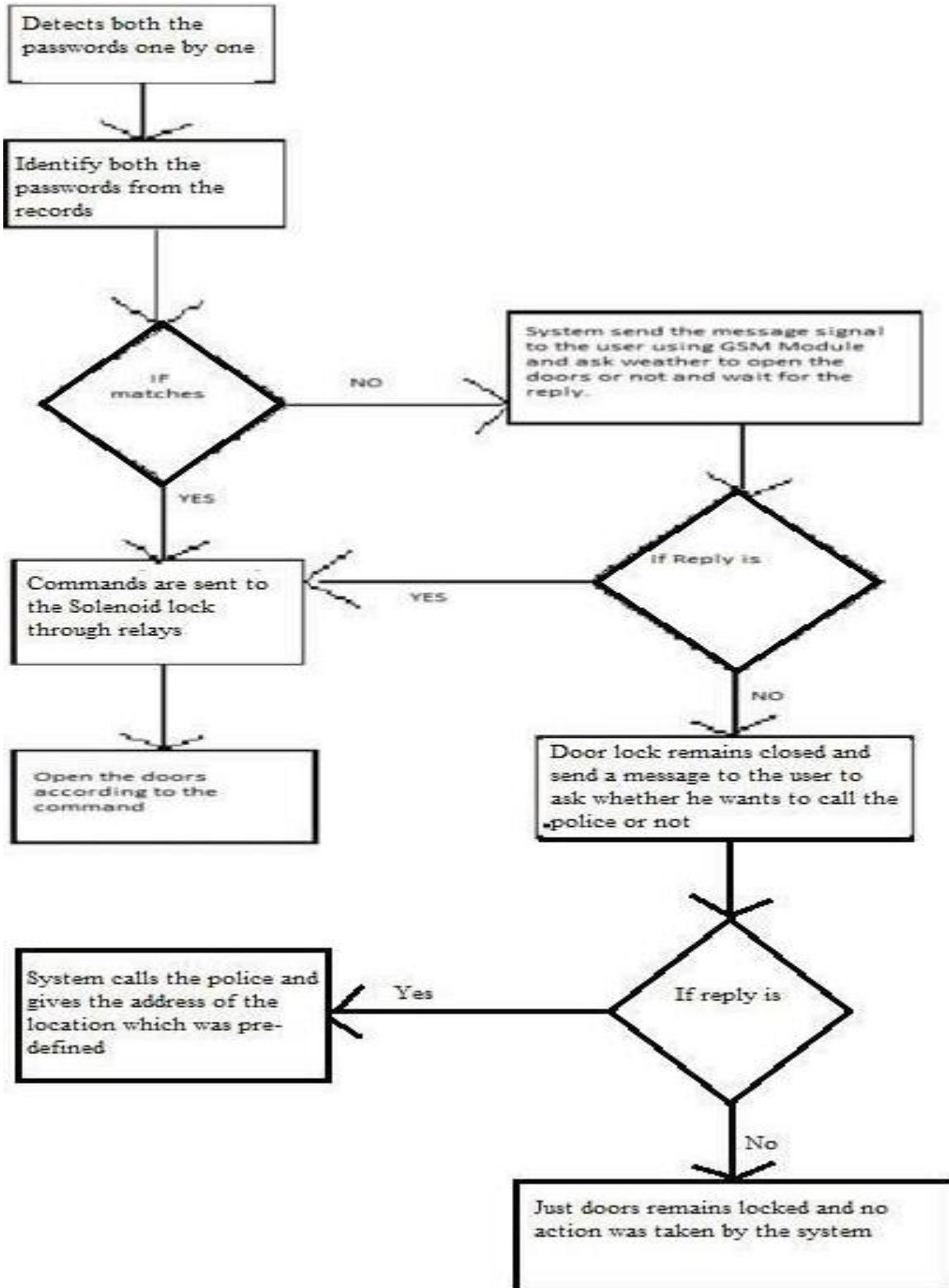
Flow chart of the System

The Authorized Person will not be inconvenienced in any circumstance and will be allowed to open the door. It will prevent illegal candidates from entering.

We are also utilising a temperature sensor in this system, which will monitor temperature variations and, if the temperature value exceeds a certain threshold, the system will notify the owner and ask him whether or not to send a message to the fire department. When the system send a message to the fire department or the police department. It will also notify the location's address to the department so that, in an emergency, aid can be dispatched to the specific spot as quickly as possible.

RESULT

The security system was prototyped and tested, as indicated in the security system functions accurately and efficiently in all aspects of its operation.

Hardware Design

The GSM module is working well. It was put to the test by sending and receiving messages, and it proved to be quite efficient at both sending and receiving messages, as well as reading and writing them. The temperature sensor was also put to the test by burning wood, and it was shown to be capable of detecting temperature variations. After entering the password, the solenoid lock works flawlessly. To link the Solenoid lock to the Arduino Uno board, an extra relay board was utilised.

The system is put to the test on a variety of metrics, including execution time and false alerts. The experiment was repeated around 20 times, with an average time lapse of 1000-1500 milliseconds in the best case and 2700 milliseconds in the worst case. That it is much faster than other security systems and has a very quick response time.

It is particularly effective in the event of a false alarm. Even after giving correct credentials, it only sent a false alert once out of 50 random tests, which is quite impressive.

DISCUSSION

After discussing the entire system, we came up with the notion of creating a gadget that might be employed for house or institute protection. We've now successfully installed the device and obtained the expected outcome. We received the device's communication and responded by unlocking the lock. As a result, the work is both successful and adaptable. The system is now ready for implementation and use.

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