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Smart OTP Based Wireless Locking System

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Abstract: ***OTP based wireless system is the advanced version of key based locking system the problem with the earlier key based locking system is that every time we need to carry a key to unlock the lock there is a high risk of losing a key if key is lost then we have to break the locking system which also result in wastage of money and for old people it is difficult to open the key based lock and there can only be one unique key for different lock you have different keys. Furthermore, carrying many keys also a burden tasks the advanced version of key based locking system is OTP based wireless locking system. This smart lock can generate a new password every time you unlock it, which further enhances your security level.***
Keywords: Risk, Burden, Unlock, Enhances

I. INTRODUCTION

Now a days technology plays a very vital role in human's life. Technology has great influence in our day-to-day life activities, and it also helps improve our surrounding also. The best example of enhancement in technology is use of mobile phone and computer which make life very easy. Our project comes under home automation. Home automation system an intelligent network of device which is used to control home appliances. In earlier stages for safety purpose Key based locking system and electronic wireless locking systems are used which are not safer. The basic problem with this type of locking system is that like in key based locking device every time we need to carry a key to unlock the door and there is a higher risk of losing a key if he is lost then we have to break the locking system which also result in wastage of money for old age people it is difficult to open key based lock and there can only be a unique key for single lock and for different lock you have different keys. Furthermore, carrying many keys also burden task. The advanced version of key based locking system is wireless locking system but here also one disadvantage is that the pin code can be easily seen or remembered by other person or by a thief under reserves in bulgary.

II. DESCRIPTION OF COMPONENT USED

A. Arduino Uno

It is a microcontroller board based on ATmega328P. It has 14 digital input/ output pin 6 analog inputs, a 16 MHz watch crystal, a USB connection a power Jack, an ICSP header and a reset button.

B. Bluetooth HC – 05

It is basically used to transfer data between two devices in this module we use Bluetooth for serial communication which provide switching mode between master and slave.

C. Servo Motor

It is basically used for performing the locking action which have very high torque. A servo motor is a Rotary actuator or linear actuator that allows for precise control of angular or linear accumulator angular or linear position, velocity, and acceleration.

D. Led

Led it used for showing whether our entered OTP is correct or not. If OTP matched, then servo motor performed action and Led will be glown.

III. FUNCTIONAL DESCRIPTION

A. Working

In this project first we connect the Arduino UNO controller to HC-05 Bluetooth module in this we connect the transmitter and receiver pin of Arduino to the HC-05 receiver and transmitter then we connect to Vcc and ground pin of HC-05 to servo motor positive and negative pin signal pin of servomotor connect to the Arduino pin number 09 then we create app using MIT app inventor for random OTP generation then we include the code portion of working to the Arduino microcontroller using Arduino IDE then we give the power supply to Arduino board through power bank or battery .

Keywords: MIT App, Arduino IDE, Microcontroller

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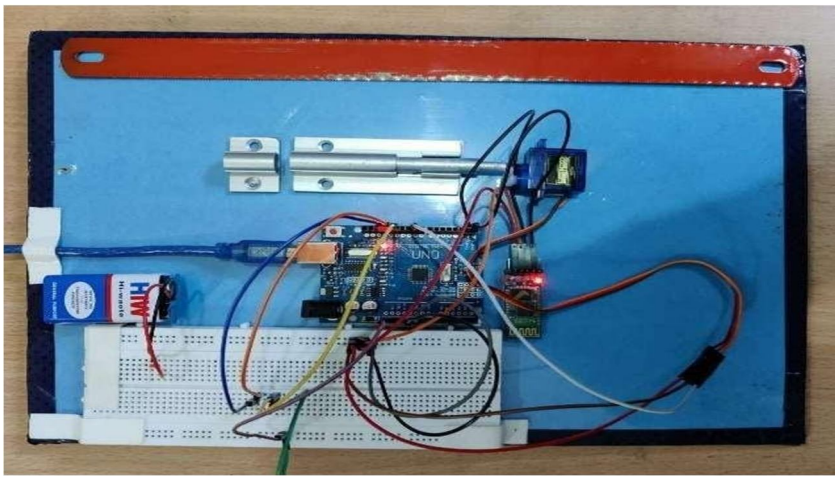


Figure 1: Working Model

B. Coding Part

First, we include the library and declare variables needed as in the snippet of code. We include the server library than we create password using string array after this we need to create more string variable to store password for OTP and LED pin number.

```
#include <Servo.h>
String dicid;
String pwd;
String letters[6] = {"ashw", "prie", "bitech", "plpl", "efdf", "gthfjk"};
String otpp = "";
String numbers[4]={"6372", "9956", "55555", "9004"};
int sled1=12;
int sled2=13;
Servo myservo;
void setup() {
Serial.begin(9600);
myservo.attach(9);
pinMode(sled1,1);
pinMode(sled2,1);
}
void loop() {
while (Serial.available()==0);
dicid=Serial.readStringUntil('\n');
if (dicid== "asdfg"){
  otp();
  digitalWrite(sled1,1);
}
check();

}

void otp(){
    otpp =  letters[random(0, 6)] + numbers [random(0, 4)] ;
  Serial.println(otpp+"\n");

}
void check(){
  while (Serial.available()==0);
 pwd=Serial.readStringUntil('\n');

if (pwd == otpp ){
  Serial.println ("unlocked");
  myservo.write(120);
  digitalWrite(sled2,1);
  digitalWrite(sled1,0);
}
if (pwd != otpp ){
  Serial.println ("reset try again");
  myservo.write(50);
  digitalWrite(sled2,0);
  digitalWrite(sled1,1);
}
}
```

Figure 2: Coding

In second part of coding, we must define the serial we must define and set the serial and baud rate of Bluetooth. Here we use a 9600 baud rate for HC-05 module. Thus, we must set up a pin for servo using servo.Attach.

After this we create a loop for checking the data coming from Bluetooth or not then we create if () statement to check device identification. If the condition matches, then the OTP () execute for the generation of OTP.



Figure 3: App Interface

IV. ADVANTAGES

A. *Ensures You a High Security*

Bulgary is the common thread for all home, shop owners any thief can easily broke the key based locking system, but a smart OTP based locking system is difficult to break or crack its code because to unlock it who unlock it every time a new OTP is sent to the owner's mobile which ensures you a high security.

B. *Easy to use by Elderly and Physically Impaired People*

This is smart lock can easily be opened by the OTP for its unlocking no key and the physical strength is required, senior citizen or disabled do not have to struggle with keys or go near the door to open it which is biggest advantage to use this locking system.

V. FUTURE SCOPE

1) This smart lock can be easily used, it is highly safer because every time you unlock it a new OTP will be generated.
2) This smart lock is not very costly so it can be availed by every common person.
3) This smart lock can easily replace the electronic lock system in future because it is highly secured.

VI. APPLICATION

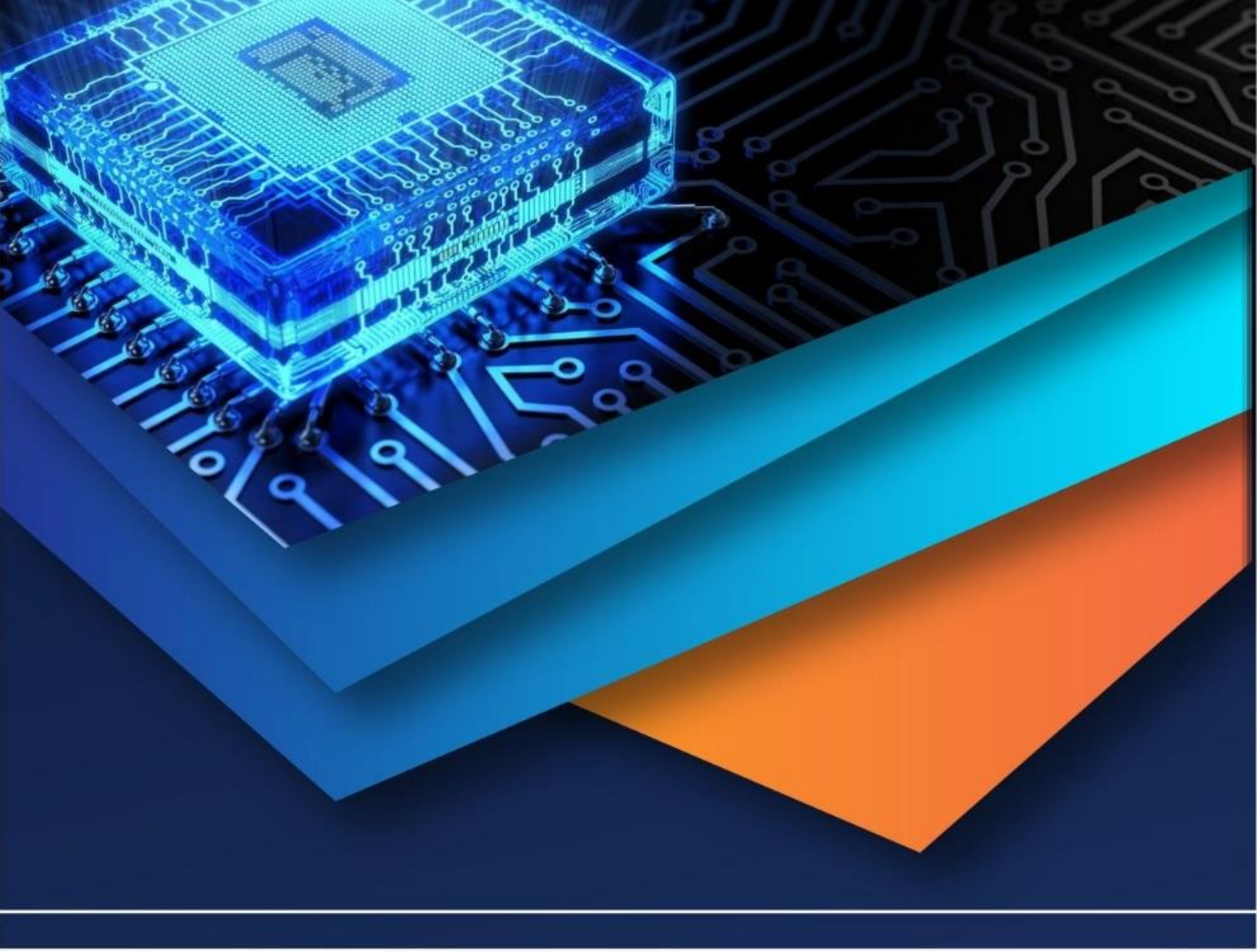
1) It can be used for door at home and offices.
2) It can be used for industrial door.
3) It can be used for high security bank door.

VII. ACKNOWLEDGEMENT

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