



Mobile Home Locking Unlocking Systel

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ABSTRACT :

The Internet of Things (IoT) is increasingly influential across various research domains, contributing significantly to modern automation that simplifies and enhances daily life. Our project, "Smart Doors," integrates IoT to create a user-friendly digital door locking system, enhancing convenience by allowing users to unlock doors within a specific range using their smartphones. This system eliminates the need for physical keys, utilizing Bluetooth and Wi-Fi for data transfer, and combines software and hardware for robust functionality. This smart lock system ensures secure environments by preventing unauthorized access.

Keywords: Arduino Uno, Bluetooth, Internet of Things, Smart door lock

I. Introduction :

The Internet of Things (IoT) network comprises interconnected smart devices, digital systems, and mechanical systems, facilitating data exchange without human or machine interaction. These smart devices, equipped with sensors, processors, and networking components, collect and share environmental data, either transmitting it to the cloud or processing it locally. This interconnected system enables informed decision-making based on real-time data.

II. Related Work :

Numerous studies have aimed to improve the security and convenience of digital door locks using IoT. These systems enhance security by sending alerts to users' smartphones when unauthorized access attempts are detected. Some systems also allow remote control of the lock, adding a layer of convenience. For instance, biometric locks, which utilize fingerprint sensors, offer enhanced security over traditional keys. Our project builds on these ideas, employing Arduino-based technology and Bluetooth for wireless control via a smartphone app.

III. System Analysis and Design :

Traditional lock systems often fall short in terms of security and efficiency, leading to potential theft risks. Our digital door lock system addresses these issues by using a PIN code instead of physical keys, thus enhancing security. Figure 1 illustrates the flowchart of the proposed system, which involves initializing connections, starting the program on an Arduino board via the Arduino IDE, and using a Bluetooth controller app on a smartphone to manage the lock. An OTP is generated and verified for additional security, with the system displaying appropriate messages on an LCD screen.

IV. Hardware and Software Requirements :

Our system utilizes several key hardware components and software tools:

- *Arduino Uno*: An open-source platform for hardware and software development, capable of reading inputs and generating outputs based on programmed instructions (Figure 3).
- *Bluetooth Module (HC-05)*: A simple, easy-to-use Bluetooth SPP (serial port protocol) module (Figure 4).
- *16x2 LCD Display*: A basic module for displaying system status, capable of showing 16 characters per line (Figure 5).
- *Servo Motor*: A DC motor for precise control of the door lock's position, with three pins for power, ground, and control.



Fig 5. Servo motor

C.Servo motor - It is an ordinary geared DC motor for precise control of angular position and show the state of door's lock or

- *Breadboard:* A solderless device for connecting and testing the Arduino and Bluetooth components.

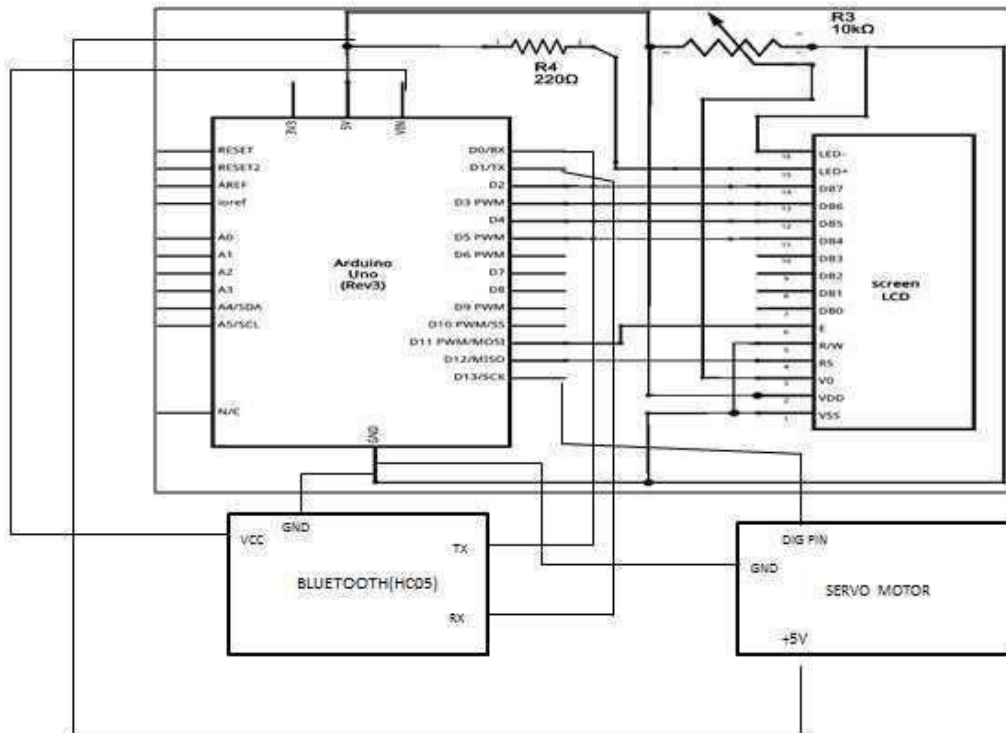


Fig 2. Schematic diagram of proposed system

IV. HARDWARE AND SOFTWARE REQUIREMENTS

Numerous hardware components and software are used to apply this work. These are mentioned below:

- Arduino Uno - Arduino is an introductory hardware and software-based open-source platform. Arduino boards can read inputs such as a finger on a button, a light on a sensor and convert them into outputs similar as operating a motor, or switching on an LED. By delivering a set of instructions to the microcontroller, we can instruct the board about its work. It is shown below in figure 3.



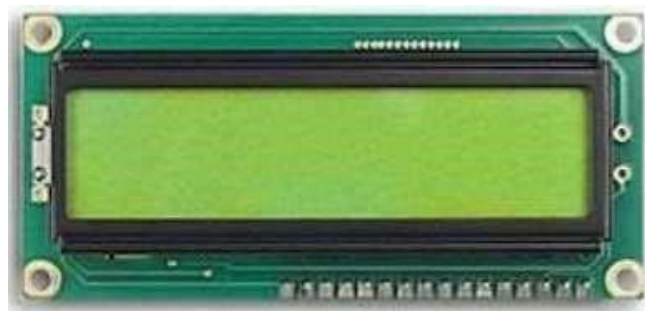
Fig 3. Arduino Uno board

- B. Bluetooth module - HC-05 module is easy to operate bluetooth SPP(serial port protocol) module .It has six pins in which 4 pins: TX,VCC,RX& GND are generally used and its default baud rate is 9600. Image is shown below.



Fig 4. Bluetooth module

- C. 16x2 LCD - 16x2 LCD display is very introductory module. it can display 16 characters per line. In this LCD each character is displayed in 5x7 pixel matrix. It can display status as per demand. Its image is given in figure unlock. It has 3 pin: GND, +5V dc and controlling pin.



- D. Bread Board - A breadboard is a solderless device for controlling or monitoring arduino pins over bluetooth.

V. Results and Conclusion :

Our OTP-based smart lock system has been positively received for meeting current security standards. The wireless nature of the system makes it cost-effective, flexible, and easy to install, eliminating the need for complex wiring and structural modifications. Users can conveniently manage access through their mobile devices, enhancing security and ease of use. The outcome of our project is depicted in the following figures.

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