Impact Factor (SJIF): 5.301

International Journal of Advance Research in Engineering, Science & Technology

e-ISSN: 2393-9877, p-ISSN: 2394-2444
Volume 5, Issue 4, April -2018

Smart Home Technology for Door Lock System

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Abstract—**In this work, we propose a Door lock System using Bluetooth. It is a part of smart home technology for door locking and unlocking operation. The ideal purpose of this work is, it greatly helps physically challenged people and old age people to lock and unlock the door without moving from their place. To perform door operation, Bluetooth enabled devices (such as mobile phones, laptops, watches) are searched first. Then the signals from mobile devices are transferred to Bluetooth module which is fixed with a breadboard. This Bluetooth module is then connected to an arduino microcontroller. C based program is embedded in arduino microcontroller to perform door lock operation. When user switch on the Bluetooth in the mobile device, the signal is transferred from arduino microcontroller to DC motor which is attached with the door? By using gear mechanism in clockwise and anticlockwise direction, the DC motor is operated to perform Door operation. For safety purpose, the project is designed with an additional facility of automatic door locking mechanism with the time span of 30 seconds after the unlock of door.**

Keywords: Adriano microcontroller, DC Motor, Bluetooth module.

I.INTRODUCTION

Most of the embedded systems hold Microcontroller inside it. This project was designed to open a door anywhere from home or building using Bluetooth. This makes a user to open a door either from Laptop or in a Mobile Phone with android application. The idea behind this project is to lock and unlock the door anywhere in our home or Organization from a single location via Bluetooth, because now-a-days Bluetooth is available in many areas for transferring a signal. The home automation function in door lock system enables user to control and monitor home environment and condition from a single master control board before entering or leaving the house. Early Bluetooth versions allowed users of cellular phones, pagers and personal digital assistants to buy a three-in-one phone that could double as a portable phone at home or in the office, get quickly synchronized with information in a desktop or notebook computer, initiate the sending or receiving of a fax, initiate a printout, and, in general, have all mobile and fixed computer devices be totally coordinated over a short distance. More recent Bluetooth versions make it possible for a user to place hands-free phone calls through a mobile phone or connect wireless headphones to a smart phone's music playlist, for example. Bluetooth technology can simplify tasks that previously involved copious wires strewn among peripheral devices. For instance, with a Bluetooth-enabled printer, one can connect wirelessly with a desktop, laptop or mobile device and print out documents. It is also possible to sync a wireless keyboard with a tablet-style device, such as an Apple iPad or Kindle Fire, or even a DVD player with a television. Laptop or desktop computers without built-in Bluetooth can gain those capabilities through an inexpensive USB dongle. The one caveat here is Bluetooth technology typically uses considerable battery power, so it's suggested that it be monitored closely by the user to prevent a device's battery from running down.

Bluetooth technology requires that a low-cost transceiver chip be included in each device. The transceiver transmits and receives in a previously unused frequency band of 2.45 GHz that is available globally -- with some variation of bandwidth in different countries. In addition to data, up to three voice channels are available. Each device has a unique 48-bit address from the IEEE 802 standard. Bluetooth connections can be point to point or multipoint.

The maximum Bluetooth range is 10 meters. Data can be exchanged at a rate of 1 megabit per second -- up to 2 Mbps in the second generation of the technology. A frequency hop scheme allows devices to communicate even in areas with a great deal of electromagnetic interference. Built-in encryption and verification is provided. Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online. You can tell your board what to do by sending a set of instructions to the microcontroller on the board. To do so you use the Arduino programming language (based on Wiring), and the Arduino Software (IDE), based on Processing.

Arduino board Supports the HC-05 Bluetooth module and never allows for large range. The Arduino microcontroller is a mini computer built for specific tasks which contains memory, storage, input and output programs on a single Integrated Circui**t.**

II. LITERATURE SURVEY

Recently, lot of researches has been devoted to a technology-based home security and automation. Smart Key Door with Wireless Security System using RF Signal [5] and Door Locking System using RFID Technology [6] using different mechanism to lock and unlock the door namely RF identification card (RFID). Both using PIC 16F87XA as a micro controller. Besides that, the Main Door Security System using SMS [3] propose the uses of Short Message Service Text Messaging (SMS) as a mechanism to control the system via mobile phone to lock and unlock the door. Rabbit Microprocessor is use as a micro controller to perform this operation. Face Recognition Based on Auto-Switching. With the rapid development in the fields of communication/networks and other related wireless technologies such as RFID (Radio Frequency Identification), UWB (Ultra Wide Band), Zigbee, NFC (Near Field Communication) and Bluetooth enable us to develop various kinds of wireless systems via handsets or Smartphone. Research by [6] use handset and actuator for remote operation of various electrical devices at home. By

pressing a single button on the handset, the signal is sent through the Zigbee technology to the actuator and subsequently switches ON/OFF the intended device. Research [6] on the other hand, demonstrated a handwriting recognition technology as a security tool to manage a security of the door. Once the disabled user enter the handwriting on the Smartphone, the door will immediately opened after going through the process of identification by the system. Researcher [6] develops a home automation through Bluetooth on Android mobile device. This system allows the user to lock and unlock a door in a short range.

III.SYSTEM DEVELOPMENT

The Structure of the proposed home door locks application via Bluetooth technology is depicted. Mobile Apps called Locklt Door is designed to allow user choose their selection whether lock or unlock the door.

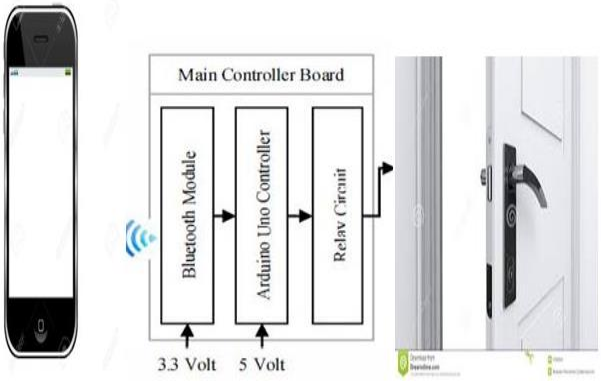

Fig1: System Architecture

Once wireless communication between mobile Bluetooth and Bluetooth module is established through a pairing process, user's key selections are sent as signal to the main controller board installed at home. Then, Arduino controller is used to interpret key selections and determines whether to release or not the electromagnetic (EM) lock home door. The Arduino controller is programmed with C language. It sensed the signal at the input port of the controller. The relay circuit that is connected to Arduino released the EM lock to open the door if the relay circuit is triggered at 12V. Hardware set-up for the entire project which compose with three main parts; Locklt Door Application on the Bluetooth enabled devices, main controller board and DC motor.
Arduino makes several different boards, each with different capabilities. In addition, part of being open source hardware means that others can modify and produce derivatives of Arduino boards that provide even more form factors and functionality. The Arduino Uno R3 is a microcontroller board based on the ATmega328 (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Atmega16U2 (Atmega8U2 up to version R2) programmed as a USB-to-serial converter.

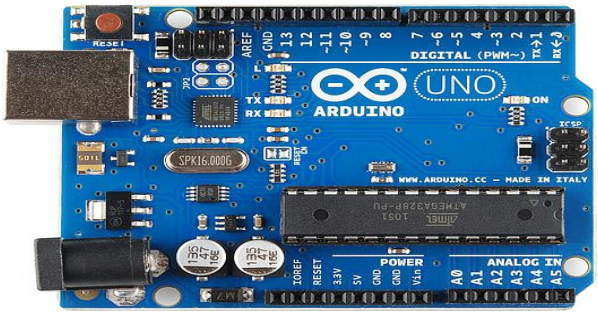

Fig2: Arduino Uno (R3)

Measurement Set-Up for Different Location:

There are three (3) different types of measurements have been done; (i) indoor and, (ii) outdoor with non-obstacle area and (iii) indoor with obstacle area. it is found that, for indoor (obstacle and non-obstacle area), the maximum distance that the receiver can detect the signal from the mobile is around 15 meters in house while for outdoor area, the maximum distance is 20 meters. In this case, it can be said that for non-obstacle area, the system can communicate between input and output at a distance of at least 20 m. However, the effectiveness of the system is reduced up to 20% for an obstacle area.

IV CONCLUSION

The goal of this study is to propose a system that can help disabled people to open a magnetic door wirelessly using Android Smartphone. The range and security aspects were considered through the use of Bluetooth technology that is embedded in the mobile device. The system was able to actuate a pin to Lock or unlock the door from a short distance away by just pressing a button on a Smartphone. The status of the door also has been created to make the system more complete. In future, the LockIt

Door Apps should offer assistance in controlling more doors, windows and basic home electronic appliances. Battery backup system should also be considered to ensure the completeness of the system.

Our proposed system exploits the ZigBee's full capacity for monitoring and controlling Room environment and condition through the digital door lock. Since our proposed system is built over Bluetooth network, it is a cheap, flexible, and easily installable.

REFERENCES:

[1]Islam, M.R., "Right of the People with Disabilities and Social Exclusion in Malaysia", International Journal of Social Science and Humanity, Vo. 5, No. 2, pp. 171-177, 2015.

[2] RA Ramlee, D. H. Z. Tang, M.M.lsmail, "Smart Home System for Disabled People Via Wireless Bluetooth", in Proc. of IEEE International Conference on System Engineering and Technology, pp. 1-4, 2012.

[3] lulisah Binti Mohamad Isah (2009), "Main Door Security System using SMS." Faculty of Electrical and Electronic Engineering, University Tun Hussein Onn Malaysia.

[4] Harnani Hassan, Raudah Abu Bakar, Ahmad Thaqib and Fawwaz Mokhtar (2012), "Face Recognition Based on AutoSwitching Magnetic Door Lock System using Microcontroller" in International Conference on System Engineering and Technology, Indonesia.

[5] Stapathy, A. and Das, D.P., "A system for remote operation of devices: Helpful for elderly and disabled people" in Proc. Of IEEE International Conf on Advanced Electronic Systems, pp. 350- 353, 2013.

[6] Kuang-Yow Lian, Sung-Jung Hsiao and Wen-Tsai Sung, "HomeSafety Handwriting Pattern Recognition System" in Proc. Of IEEE 1ph International Conf on Cognitive Informatics and Cognitive Computing, pp. 477-483, 2012

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