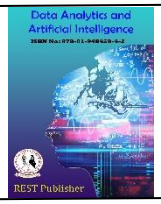
DOI: https://doi.org/10.46632/daai/2/4/12

Data Analytics and Artificial Intelligence
Vol: 2(4), 2022
REST Publisher; ISBN: 978-81-948459-4-2
Website:http://restpublisher.com/book-series/data-analytics-and-artificial-intelligence/



Arduino Based Rfid Attendance System with Audio Acknowle dgement

***Sudhakar S, Joel Moses M, Kishore R, Harish D**
Veltech HightechDr.RangarajanDr.Sakunthala Engineering College, Chennai, Tamil Nadu, India
*Corresponding author Email: sudhakar@velhightech.com

Abstract: For industries and businesses, there is a growing demand for secure systems that are reliable and respond quickly. RFID (Radio Frequency Identification) is a fast and accurate method of identifying any physical object. Because of their non-line-of-sight technology, they can be read wirelessly, hold more information than barcodes, and are more durable. RFID tags can read in any tough environment, rendering other read technologies such as barcode or optical card readers worthless. In this study, we presented a secure mechanism for delivering information on authorised and unauthorised individuals. When a card is brought close to the RFID module, the system scans the data on the card and compares it to the data in the programme memory, indicating whether the entry is authorised or not. The gate opens for authorised entry, marking the attendance corresponding to that code id and saving it in excel sheet format on SD card, then displaying all information on the LCD, such as name and employee code number that link with authorised entry and welcome message with audio greetings by taking their name that is already saved in SD card, and the gate remains closed for unmatched entry, by playing a separate audible message through the speakers, the security person is alerted.

Keywords: RFID, Arduino NUO, RFID Reader

1. Introduction

RFID technology allows you to identify something quickly and easily. Barcodes, optical character recognition, biometrics, and smart cards are examples of other methods of identification, but the RFID system's potential application area is substantially larger. Only a few of the subjects covered include transportation and logistics, security and animal tagging, postal surveillance, time and attendance, and road toll management. RFID tag is miniature transponders that wirelessly reply to reader queries and send a serial number or other identifier. RFID systems are commonly utilized to develop an access control system that keeps illegal personnel out of the premises. Employees used an RFID-enabled access badge to control access. If the RFID chip code matches the record code, the gate opens; otherwise, it remains closed. An electromagnetic field is utilized to exchange information between the reader and the chip, allowing for accurate authentication and tracking. We wish to build a system that goes beyond RFID detection and stamping authorized entry attendance in this project. The new strategy is to roll out a feature called "VOICE GREETINGS." As a result, we used an SD card module to save a large number of audio files with different names and phrases, each with its own tag ID. When a card is recognized, the audio file connected with it is played, and if the card id matches the saved code, GATE opens, greets the user, and saves their attendance to the memory card using an EXCEL sheet. As a result, it provides an excellent SECURITY and ATTENDANCE system, particularly because of its unique function of GREETING the individual by yelling their name. As a result, it creates a superb SECURITY and ATTENDANCE system, especially with its unique feature of GREETING the individual by shouting their name. The rest of the paper is laid out as follows: The suggested system architecture and flowchart are presented in section two, the proposed circuit diagram, findings, and discussion are presented in section three, and the article is concluded with future scope in section four. In this study, we describe a low-cost system based on the newest microcontroller technology.

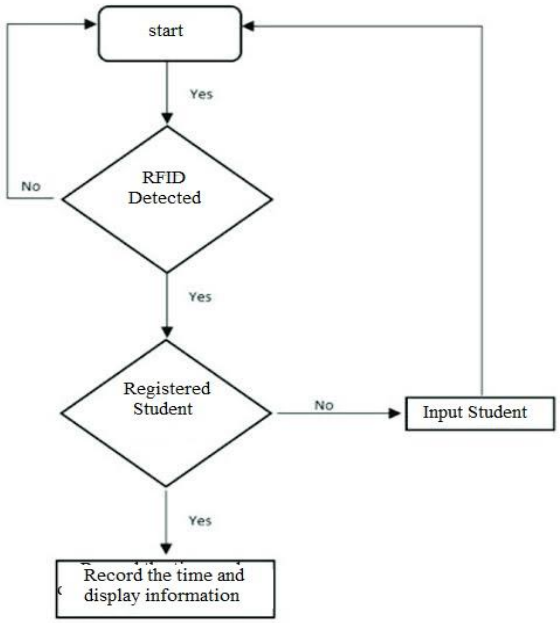


FIGURE 1. RFID technology

2. Hardware Description

The following modules are included in the proposed system architecture:

a) ARDUINO UNO R3
b) RFID READER
c) RFID TAGS
d) MICRO SD CARD
e) LCD
f) SPEAKER
g) MOTOR

Arduino Uno R3: Arduino is a company, an effort, and a user community that creates single-board microcontrollers and microcontroller kits for building digital devices with open-source hardware and software. Its hardware is licenced under the Creative Commons BY-SA licence, and its software is licenced under the GNU Lesser General Public License (LGPL) or the GNU General Public License (GPL), allowing anybody to build Arduino boards and share software. Commercial Arduino boards can be purchased from the official website or through authorised resellers. Arduino manufactures a variety of microprocessors and controllers. Digital and analogue input/output (I/O) pins on the boards can be connected to a number of expansion boards. The PCBs include serial communications interfaces, They are used in the loading of programmes as well The Arduino programming language, which is based on Processing and comes with a modified version of the Processing IDE, may be used to programme microcontrollers using C and C++ programming languages and a standard API. In addition to typical compiler toolchains, the Arduino project provides an integrated programming environment (IDE) and a command-line tool developed in Go.

FIGURE 2. Arduino Uno R3

Rfid Reader: RFID readers, also known as proximity coupling devices, read data from the tag antenna at a certain frequency. The reader generates a radio signal that the passive tag can read in the event of a passive tag. The reader transforms the data received and transfers it via wired or wireless connection to the forwarding system. A single reader can read many frequency-based tags.

FIGURE 3. Rfid Reader

Rfid Tags: An RFID tag that can be powered actively or passively is known as a proximity integrated circuit card. An antenna, a microprocessor, and a battery make up RFID tags, also known as transponders (for active tag only). The size of the chip is usually governed by the size of the antenna. The frequency of the tag determines the antenna's size and form. Passive tags are fueled inductively by the radio signal emitted by the RFID reader, whereas active tags include a power source on board. The active tag can record sensor readings or execute calculations in the absence of a reader. Passive tags can only be used in the presence of a reader. Some tags feature rewritable memory in addition to the microchip, the size of which varies depending on the use. The purpose of a microchip is to store the Unique Identification Number (UID) of each object (ID). This ID is stored as a serial number in the RFID memory. The frequency of RFID tags determines their range. The three frequency bands are low frequency (30-500 KHz), high frequency (10-15MHz), and ultra high frequency (10-15MHz) (2.4- 2.5GHz). Other performance characteristics and interference resistance are determined by this frequency range.

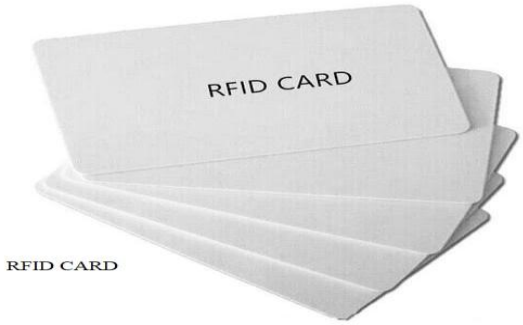


FIGURE 4. Rfid Card

Micro Sd Card: In the suggested configuration, a micro SD card was used, which was also connected to the controller. The primary use of this SD card is to store employee information such as names, which are displayed on an RFID tag and read by an RFID reader. The gate opens if the read code matches the recorded base code, and all data connected with that code is shown on the LCD.

FIGURE 5. Micro Sd Card

Lcd: The main objective of the LCD in this proposed design is to display information such as the employee code and name, as well as a welcome message saved on the SD card, when the tag matches the base code. The LCD that was used has a 16*2 format.

FIGURE 6. LCD

Motor: A motor is an electrically powered mechanical device that converts electrical energy into mechanical energy. In this project, a DC motor is used to open the gate when the tag code matches the saved code in the software. The DC motor uses relatively little electricity to operate and swiftly opens the gate.

FIGURE 7. Motor

3. Result and Discussions

Working: When an RFID tag is placed on an RFID reader, the reader reads the tag and sends the code to the controller; if the code matches the stored code, the door opens for authorised entry; if the code matches the stored code, the door opens for authorised entry; and if the code matches the stored code, the door opens for authorised entry; and the attendance corresponding to that code id is marked and saved.

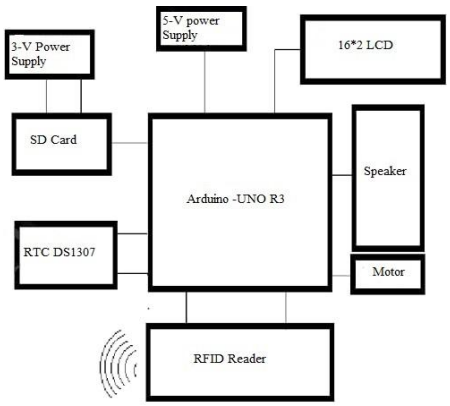


FIGURE 8. Block Diagram of the Circuit

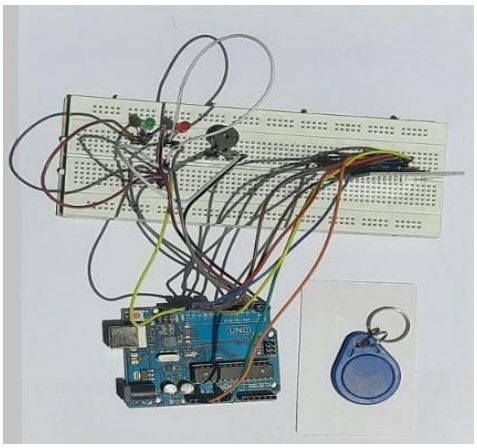


FIGURE 9 . Circuit Diagram of Proposed Circuit

4. Conclusion & Future Scope

The advantages of RFID technology were used to successfully design and execute an automated attendance recording system in this paper. This approach has the ability to save a significant amount of time and labor in the administration of any organization. It's a cost-effective system with high efficiency. It also has the advantages of low cost and simplicity. Future scope .1) a voice announcement system might be beneficial to this project. As a result, we can display notifications like "Your attendance has been recorded" or "Your card is invalid" whenever someone checks in. 2) we can convey this information to the user via the internet. So that the user can access it from anywhere in the world via the internet. 3) We are able to make advantage of GSM technology. As a result, the scope of this project will be broadened to incorporate an RFID Attendance System with SMS Notification.

References

1. Dorman ,D., 2002. Technically speaking New Vendors heating Up radio Frequency ID Market. MOLNAR.D,WAGNER. D (2004).
2. Library RFID privacy and security: Issues, practices, and rchitectures.
3. SCANLON.L(2003).Good vibrations. Technology Review
4. GIAN DOMENICO ROMAGNOSI. (2009). In Encyclopedia Britannica. Retrieved October 25, 2009
5. JOHN CURTIN ROBERT KAUFFMAN.J, FREDRICK RIGGINS.J Information Technology and Management
6. “Simulation of Attendance on college ” by DANIA ERIDANI , EKO DIDIK Indonesia
7. “RFID Based Attendance System” by T.S. LIM , S.C. SIM and M.M. MANSOR Faculty of Engineering and Technology, Multimedia University,Malaysia