



KLE Technological University
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School
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Electronics and Communication Engineering

Mini Project Report
on
ATTENDANCE MONITORING SYSTEM

By:

- | | |
|-----------------------|------------------|
| 1. Gagan P.A | USN:01fe19bec220 |
| 2. Vinaykumar B Patil | USN:01fe19bec207 |
| 3. Madhukeshwar V.P | USN:01fe19bec063 |
| 4. Vrashank | USN:01fe19bec033 |

Semester: V, 2021-2022

Under the Guidance of

Prof.Prashant V Achari
Dr.Saroja V.S

**K.L.E SOCIETY'S
KLE Technological University,
HUBBALLI-580031**

2021-2022



**SCHOOL OF ELECTRONICS AND COMMUNICATION
ENGINEERING**

CERTIFICATE

This is to certify that project entitled “ Attendance Monitoring System ” is a bonafide work carried out by the student team of ”Gagan P.A(01FE19BEC220), Vinaykumar B Patil(01FE19BEC207), Madhukeshwar V.P(01FE19BEC063), Vrashank(01FE19BEC033)”. The project report has been approved as it satisfies the requirements with respect to the mini project work prescribed by the university curriculum for BE (V Semester) in School of Electronics and Communication Engineering of KLE Technological University for the academic year 2021-2022.

Prof.Prashant V.Achari
Guide

Dr.Nalini C.Iyer
Head of School

Dr.N.H. Ayachit
Registrar

External Viva:

Name of Examiners

Signature with date

1.

2.

ACKNOWLEDGMENT

We thank our guide Prof. Prashant V.Achari for his continued support and guidance throughout the course of the project.We thank Dr.Saroja V.S, for all the valuable inputs and assessment. We also thank Mrs. Nikita Patil for her continuous motivation.

-The project team

ABSTRACT

The Educational Institutions or any other organisations need to monitor the movements of individuals within their boundaries. This task cannot be handled manually on a consistent basis. In order to assist the human force, we can use the technical systems. We have the attendance monitoring systems based on face recognition, biometric, blue-tooth, Rf-id and many more. In this project, we have considered Rf-id based attendance monitoring system which can help the teaching staff. This project uses Rf-id reader which reads when the Rf-id tag is brought nearer. Then the reader processes and sends the data to the micro-controller which stores the values and displays the desired output on the lcd. Once the authenticator presses the tactile switch, the micro-controller sends the data to the server(ThingSpeak) through the wifi device(esp8266). The attendance of the individuals will be displayed. This project's main motive is to aid teachers' in managing the attendance of the students.

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Chapter 1

Introduction

1.1 Motivation

Marking attendance is a tedious and time consuming process if done manually and hence in this automated era, we decided to work on the attendance system that would be user friendly and fast. We hence read many a research papers and tried to come up with the best system that would use low cost technology and already available soft-wares to connect various systems that would manage student attendance and class details effectively.

1.2 Objectives

- 1.To mark the attendance of students and store it in the database.
- 2.To avoid proxy we have used RFID tags which will be distributed to each and every student which will be unique for each.
- 3.We build a cheaper and portable model which will be userfriendly for users.

1.3 Literature survey

1.3.1 Approach 01

[?]This paper contains the information of Attendance monitoring system based on RFID using GSM Network. RFID uses electromagnetic coupling between the chip and reader. RFID tags are been classified as active tags (contains inbuilt batteries) and passive tags (don't contain inbuilt batteries). We use GSM (Global system for mobile) standard for communication of mobiles. GSM is a digital system using TDMA technology. All the information like student name, ID, mobile number, password and attendance record will be stored in the database. Here we use UART to send or receive the data. The RFID data is sent to system and then it will match with database if it exists the success message will appear or else new record button will appear.

1.3.2 Approach 02

[?]This paper contains information of capturing student attendance based on android based attendance system. As all have their own mobiles it's easy for lecturers and that even reduces the cost of hardware. Admin needs to install an application in there android device and login into that application with their user name and password, then after login it directly redirects to another page that tells them to enter the course code and student group will be checked.

Then the selected students who have registered will be in a list, that list will be downloaded from database in android device. By this list student attendance will be checked through the application and the camera to scan the QR code present on the ID card. When all the attendance is been registered admin can upload the updated list back to online data base server.

1.3.3 Approach 03

[?]This paper says about the attendance monitoring system can be checked automatically through the RFID and IOT by cloud. RFID chips are cheaper in cost but, cost varies according to distances we choose. When RFID of student ID card is been detected data will be saved. Cloud is the database in project so that we can use IOT. Hence we can access the data from anywhere. Then we use camera to get images and we extract the frame two times. We do image comparison by pixel values. When we get results of image comparison we have to get the information of student. Attendance will be then uploaded and stored in the internet as per time.

1.3.4 Approach 04

[?]This paper tells about the attendance monitoring system using Near Field Communication (NFC). This contact-less technology will be more secured and fast identification by tags which are been assigned initially. We have chosen fingerprint identification because it is cheaper and easily available. Due to security purpose cards are been distributed to the students through that card we get the information of that student. The admin verifies the student by the cards which are been distributed. There is a terminal which serves the interface between the student and the system. Terminal reads the card and fingerprint from card and then register the event. Terminals work independently from each other.

1.3.5 Approach 05

[?]In this paper, the attendance is been monitored by image of face captured by the device. Group of images are been captured and recognised on an individual basis. The face recognition is a method of distinguishing an individual, it recognizes picture or image of a student and saves the database. We train the image as the name of registered number so that it's easy to differentiate the students and these trained data will be saved in the SQL server database. Machine needs to understand the image clearly so, the image will be trained many times until it gets clear clarification of an image. Face detection is been done on each student by their identity as a number which is been registered. When the camera is on, it starts capturing images of student and the name of registered number will be saved and then creates attendance report in excel sheet.

1.4 Problem statement

Design a smart attendance system using Thing-Speak as server and ESP8266 as the wifi module. A server is set up on Thing-Speak to process the data and mark the attendance of the student, hence the attendance monitoring system.

1.5 Project Planning and bill of materials

As we need to capture the data from the RFID tag, when the person come in the range of RFID reader we will need to detect the presence of any RFID tag which is achieved through ESP8266 module.

Sl.No	Component	Price(Rs.)	Quantity
1.	Arduino UNO	800	1
2.	RFID Reader	102	1
3.	RFID Tag	30	5
4.	LCD	115	1
5.	ESP8266	108	1
6.	Voltage Regulator	20	1
7.	Dot pcb	30	1
	Total cost	1210	

1.6 Organization of the report

- Chapter 2 gives details about the system that we have designed and the various functional blocks and flow diagrams that we have used in the project.
- Chapter 3 deals with the implementation aspect of the project hence all related achievements in the form of the hardware and software are here mentioned and snapshots of the system/software that was built has been shown in this section.
- Chapter 4 the crucial part of the project and hence talks about the results and observations derived from the project and experiments. Ways to optimise the system have also been briefed in the same.
- Further the conclusion and application of the project has been briefed in the last chapter 5.

Chapter 2

System design

In this Chapter, we list out the interfaces.

2.1 Functional block diagram

picture

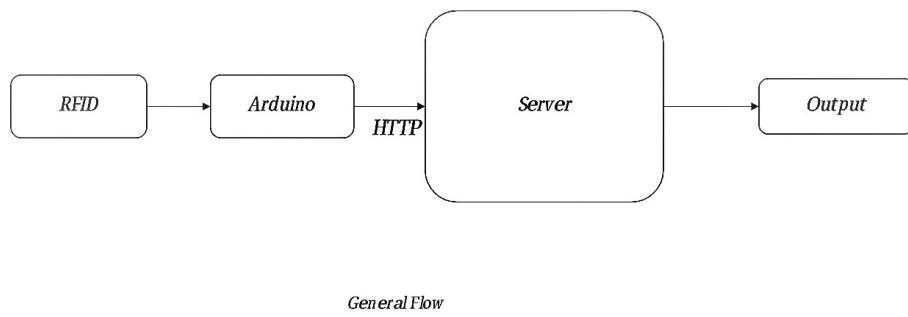


Figure 2.1: General flow

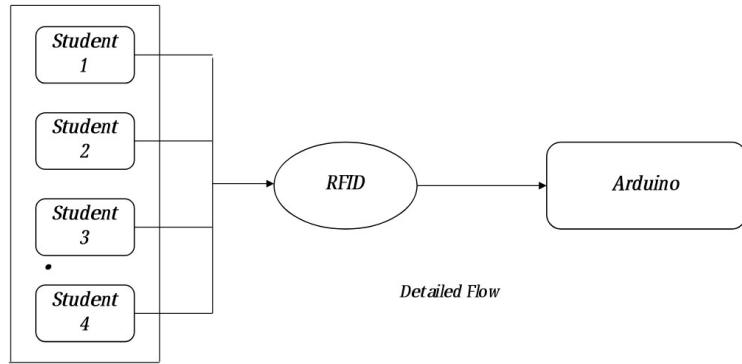


Figure 2.2: Detail flow

2.2 Design alternatives

We can make attendance monitoring system using the following technologies:

- 1.Face recognition
- 2.Finger print recognition
- 3.Voice recognition
- 4.RFID tags
- 5.Pin number

2.3 Final design

We select one of the optimal solutions based on its working and ease of the implementation, that is,attendance monitoring system using rfid.

```

// Arduino code for Attendance System
// This code reads an RFID card and prints the ID to the Serial Monitor

#include <SoftwareSerial.h>
SoftwareSerial mySerial(10, 11); // RX, TX

void setup() {
  mySerial.begin(9600);
}

void loop() {
  if (mySerial.available() > 0) {
    String id = mySerial.readStringUntil('\n');
    id.trim();
    if (id == "1234567890") {
      Serial.println("Attendance Marked");
    }
  }
}

```

Figure 2.3: arduino code

```
#include <OneWire.h>
#include <DallasTemperature.h>
#include <SoftwareSerial.h>

SoftwareSerial mySerial(10, 11); // RX, TX
OneWire oneWire(D2);
DallasTemperature sensors(&oneWire);

void setup() {
  Serial.begin(9600);
  sensors.begin();
}

void loop() {
  float temperature = sensors.getTempByIndex(0);
  if (temperature > 30) {
    mySerial.write("1");
  } else {
    mySerial.write("0");
  }
}
```

Figure 2.4: arduino code

```
#include <OneWire.h>
#include <DallasTemperature.h>
#include <SoftwareSerial.h>

SoftwareSerial mySerial(10, 11); // RX, TX
OneWire oneWire(D2);
DallasTemperature sensors(&oneWire);

void setup() {
  Serial.begin(9600);
  sensors.begin();
}

void loop() {
  float temperature = sensors.getTempByIndex(0);
  if (temperature > 30) {
    mySerial.write("1");
  } else {
    mySerial.write("0");
  }
}
```

Figure 2.5: arduino code

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
100	2021-12-15T18:04:13+05:30		99	VINAYAKUN	01FE198ECCD													
101	2021-12-15T18:04:32+05:30		100	MADHUKES	01FE198ECCD	Absent												
102	2021-12-15T18:04:52+05:30		101	VRASHANK	01FE198ECCD	Absent												
103	2021-12-17T21:51:13+05:30		102	GAGAN P.A	01FE198ECCD	Present												
104	2021-12-17T21:51:53+05:30		103	MADHUKES	01FE198ECCD	Present												
105	2021-12-17T21:52:13+05:30		104	VRASHANK	01FE198ECCD	Absent												
106	2021-12-17T21:56:33+05:30		105	GAGAN P.A	01FE198ECCD	Present												
107	2021-12-17T21:56:53+05:30		106	VINAYAKUN	01FE198ECCD	Present												
108	2021-12-17T21:57:13+05:30		107	MADHUKES	01FE198ECCD	Present												
109	2021-12-17T21:57:33+05:30		108	VRASHANK	01FE198ECCD	Absent												
110																		

Figure 2.6: Display of the student status in excel sheet

Chapter 3

Implementation details

3.1 Specifications and final system architecture

3.1.1 Components



Figure 3.1: Rfid reader

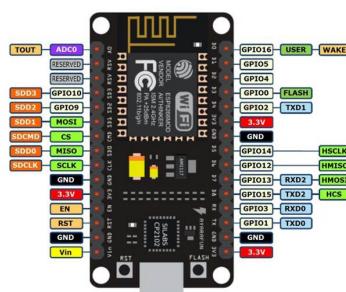


Figure 3.2: Wifi module:ESp8266



Figure 3.3: Arduino Uno:AtMega328p u

3.1.2 Specifications

1.Rfid

Frequency Range:13.56 MHz ISM Band

Host Interface :SPI / I2C / UART

Operating Supply Voltage is between 2.5 V to 3.3 V

Max. Operating Current is 13-26mA

Min. Current(Power down) is 10 μ A

Read Range 5 cm

2.ESp8266

Operating Voltage is 3.3V

Input Voltage lies between 7-12V

Digital I/O Pins (DIO): 16

Analog Input Pins (ADC): 1

UARTs: 1

SPIs: 1

I2Cs: 1

Flash Memory: 4 MB

SRAM: 64 KB

Clock Speed: 80 MHz

2.ArduinoUno

Microcontroller used is Microchip ATmega328P

Operating Voltage is 5 Volts

Input Voltage lies between 7 to 20 Volts

UART: 1

I2C: 1

SPI: 1

Flash Memory: 32 KB of which 0.5 KB used by bootloader

Clock Speed: 16 MHz

3.1.3 System Architecture

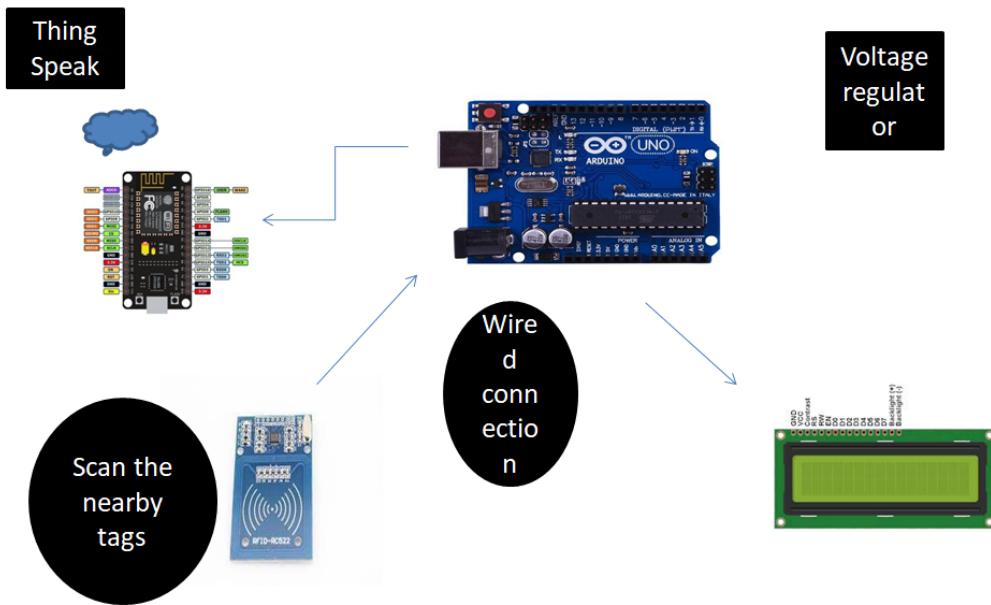


Figure 3.4: System Architecture

3.2 Flowchart

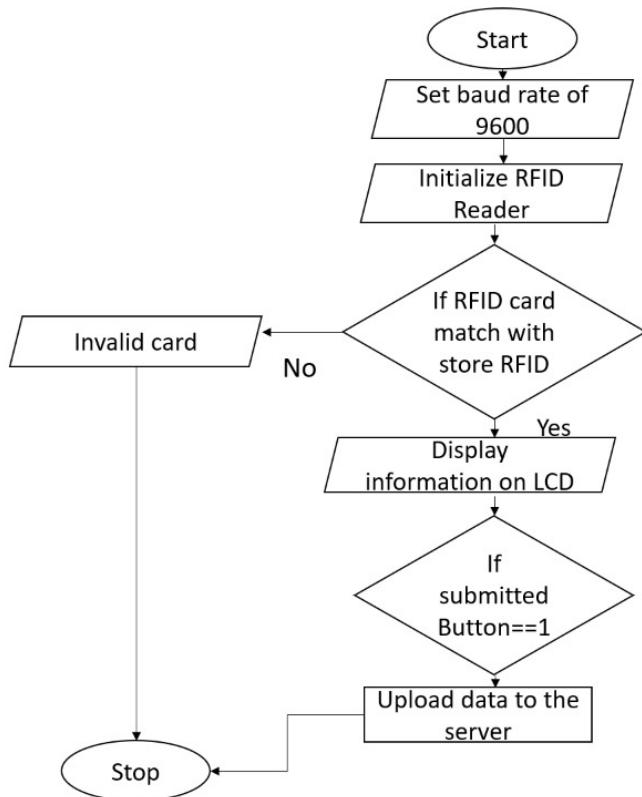


Figure 3.5: Flow chart

Chapter 4

Optimization

4.1 Introduction to optimization

The basic objective in design optimization may simply be to reduce the cost of production or to increase production efficiency. An optimization algorithm is a method that is carried out iteratively by comparing different solutions until an optimum or satisfying answer is discovered. Optimization has become a part of software package activities since the introduction of computers. Additionally, optimization is space-specific.

4.2 Types of Optimization

- Code optimization
- Time and Memory optimization
- Cost optimization

4.3 Selection and justification of optimization method

4.3.1 Time and memory Optimization

Time optimization achieved through by making the scanning time as small as possible so that the tag scan for a small interval of time and detects the nearby available Rfid tags (Memory optimization needs to be looked into).

Chapter 5

Results and discussions

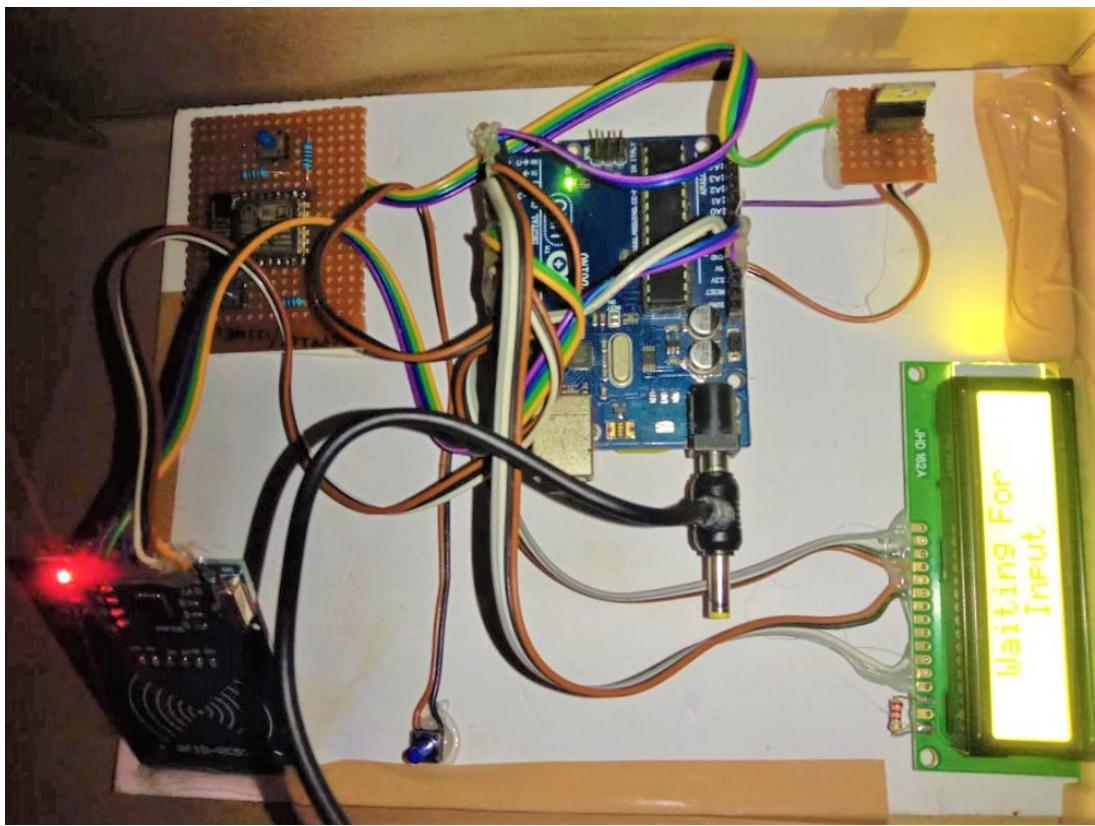


Figure 5.1: Set up of the project and ready to read the tags



Figure 5.2: Student1 scanning his tag



Figure 5.3: Student2 scanning his tag

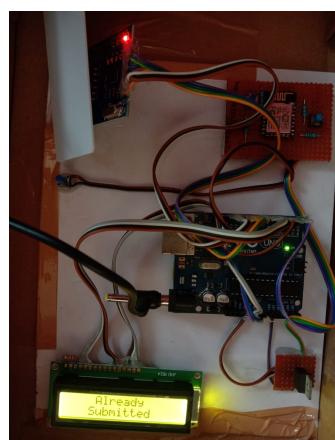


Figure 5.4: Particular student can scan once only

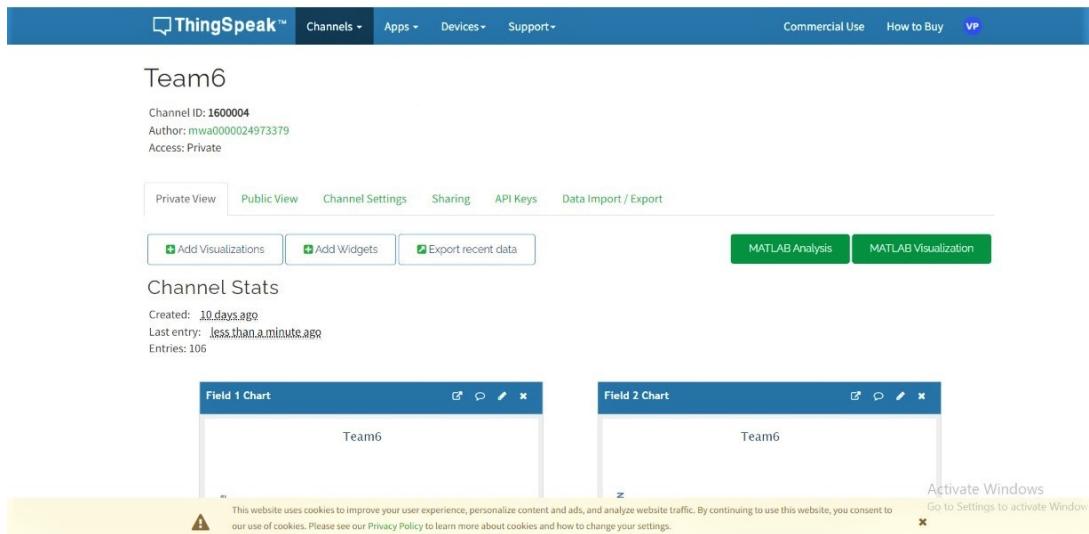


Figure 5.5: Data uploaded to the server(thingspeak) after taking the attendance

5.1 Result Analysis

The solution of the problem statement is achieved. Our proposed product of Attendance Monitoring System successfully scans nearby Similar Rfid tags when brought near to the rfid reader and then based on the analysis of which is done with the help of algorithm we have used in it, it updates the entry time of the student and his/her status . Whenever a tag comes within the range of 5 cm, our Reader successfully processes and sends it to the arduino which in turn uploads the data through the wifi module.Hence, based on the snapshots of the results above there, we can say that our problem statement is achieved.

5.2 Discussion on optimization

In the design of a system, optimization plays a significant role. We are still looking to optimise the the memory related topics.The length of the code, execution time, memory needs, and resource allocation are all important factors in code optimization. To solve this, several optimization strategies have been offered in the literature. One of the most often utilized optimization techniques for engineering and nonengineering applications is the evolutionary algorithm. This study presents a review of numerous code optimization methodologies based on different types of evolutionary algorithms, as well as a comparison of their performance to traditional methods.

Chapter 6

Conclusions and future scope

6.1 Conclusion

6.2 Future scope

In present situation, class attendance monitoring system plays a significant role. The future scope of this project is to reduce the time of the lecturers in taking attendance of each student. We can create a server that can handle all the database. This will also reduce manipulation of attendance record done by the students. And this system can also be used at the time of elections where the voters can be identified easily.

6.2.1 Application in the societal context

The lecturers face consequences like wastage of time and even proxy attendance is an obvious issue. So, marking attendance is a tedious and time consuming process if done manually. Hence we have switched from manual to automated attendance monitoring system that would be faster and user friendly. We have used already available hardware devices which helps to reduce the cost of system.