

Smart Attendance System and Path Follower Mechanism with Monitoring

Harshal S. Patil¹, Ishwar S. Jadhav², Chaudhari Vijay D.³, Ingale Hemant T.⁴

¹PG Scholar, M.E. (VLSI & Embedded System Design)

^{2,3}Asstt. Prof. ⁴Asstt. Prof and Head

^{1,2,3,4} E&TC Engg dept, GF's Godavari College of Engineering, Jalgaon-4252001, Maharashtra, India

patil.harsh1177@gmail.com¹ ishwar.jadhav@rediffmail.com² vinuda.chaudhari@gmail.com³ hetui@rediffmail.com⁴

Abstract- Successful schools tend to make sure that their students come to school regularly. The consequences of low attendance of students are serious and they affect the community. The classical way of taking attendance by saying student's names causes time consumption, insecurity and inefficiency. The attendance system depending on Radio Frequency Identification technology is one of the tools to solve this trouble. This system is used at universities, school, and business sites. Several studies is published in this field for improving and replacing the classical method of taking attendance by RF module based technology for attendance system. The principle operation of RF modules attendance system depends on tagging objects to identify them. The RF modules technique gives several benefits over classical method of taking attendance in class whereas the system is able to uniquely identify each person depending on their RF modules unique codes for each students, so that the operation of taking the attendance is easier, faster, and more secure comparing with classical method. The real time clock attendance taken will be more accurate

The attendance system proposed is used to manage attendance system in large and branched factory or university from central unit. It consists of terminal units and a central unit. Each terminal unit consists of Arduino Microcontroller (ATMEGA328), LCD display, RF modules as transponder card with each user (like student) and board. The central unit consists of Arduino, Matlab and a computer. The terminal unit is responsible of making a connection with a transponder card to bring its ID's and make a comparison with the names listed in the database of to get the names of the absent students and send their serial numbers by using RF modules. The central unit is considered as a heart of system where it is

responsible of collecting all the information from the terminal units, displaying them and making special processing to take a decision about persons whose absence.

RF modules based attendance system is quite simple technology that minimizes the time to take and maintain the attendance of each class in school, colleges or unit. Each student provided a special module with unique identification code related their respective classroom to get noticed by attendance system. These system will reduced the time and effort require to maintain daily attendance of each class and also capable to provide students daily/monthly records in a scale of percentage. In which students having attendance below 75% will displayed in red colour, more than that will displayed in green. In this way the attendance system will minimize the efforts and time to take attendance and time to calculate attendance.

Keywords- ATMEGA328, LCD, LDR, RF, USB, RFID

I-INTRODUCTION

The electronic platform for education when compared to other conventional techniques and access of nearly all processed data on the Internet, these days has resulted students to be less motivated for attending the class lecture than compared before. Indolence on the part of students, nonchalance to school work, extra social activities that have created managerial are major issues for the institutions. Lecturers and administrators in most developing countries have had to come up with ideas to make certain that a hearty involvement from students, and ensure that the teacher-student interaction is kept strong. Managements have employed simple ideas like roll calls, quizzes and extra credits for such issues. These practices are however time consuming, nerve-racking and laborious

because these consume more working time and also are not completely accurate. As the technology is progressing, record and assessment systems are currently in more demand as devices are integrated with each other and can work as an automated control network. Providing a sophisticated control environment has become nowadays a primary need of every control environment. Our proposed smart control system can be a perfect environment for an expert system where it can manage the controlling environment in a convenient way; it can provide quite efficient ways to perform goals like managing administrative tasks of the environment while conserving energy. The system is designed to be of adaptive nature and can easily adapt the present environment by collecting the data from the intelligent sensor network designed to provide real time feedback.

An RF module based attendance system is able to change the applications of management, assessment, inventory control and record database. Automatic identification and process control are keys to improve efficiency. Using the RF module based technology can achieve the part of automatic identification and attendance. The system is mainly incorporated with three top technologies providing a very sophisticated control for management. The technologies included in this project are RF module, LCD, Arduino Microcontroller, LDR, USB to TTL, MATLAB module. The combination of these methods reduces complexity in the system for the design engineer but it carries the user to a very comfort zone where user can perform his tasks idly. The system can also be said as wireless medium, providing automatic attendance system in an easy and correct way effortlessly with no wastage of time.

The attendance system proposed is used to manage attendance system in large and branched factory or university from central unit. The terminal unit is responsible of making a connection with a transponder card to bring its ID's and make a comparison with the names listed in the database of respected classrooms. The central unit is considered as a heart of system where it is responsible of collecting all the information from the terminal units, displaying them and making special processing to take a decision about persons whose absence. to maintain daily and monthly records.

II. LITERATURE REVIEW

Smart Attendance Record

Logging attendance for students is always an oppressive job. Their check-in and check-out time, duration of their presence, if managed manually is a huge task. Also, if

done using traditional methods like bare code, smart card and short range RFID lead to waste of time and persons queue. The proposed system would simplify this problem in the following case. When an student enters the university, the reader node detects its tag, so that it's check-in time is marked and log is maintained at the central database server. This operation repeated when he sits in a class room, etc. Student has the liberty of wandering in the university premises. Many hours duration of presence should be required in a day to confirm his or her attendance at the end of the day. Table 1 below shows the comparison summary of various identification technologies.

Table 1: Comparison of Identification Technologies

	RFID	Barcode	Smart card
Line of Sight	Not required (in most cases)	Required	Required (exposed to reader)
Memory	Small ≥ 2 KB	No memory	Large
Cost	Medium	Low	High
Range	Inches to 100's of feet	Inches to feet	Inches
Reusability	Yes	No	Yes
Read Rate	Multiple (simultaneously)	One at a time	One at a time
Security	Medium	Very Low	High (Encryption)

Previous Work:

Samuel King Opoku [1] have underwent a project based on biometric system. In this system, time and attendance software is paired with a time clock which uses biometric technology for authenticating persons.

The employees can use their fingerprints for clocking in and clocking out. Similar technology was implemented by Simao, P. Fonseca, J. Santos [2], with the two technologies namely Embedded system and Biometrics.

Arulogun O. T. , Olatunbosun, A. , Fakolujo O. A. , and Olaniyi, O. M [3] have developed an RFID based Attendance System that are commonly used to track of attendance for community organizations like educational institutions, business organizations etc. Similar project was undertaken by Nurbek Saparkhojayev and Selim Guvercin. Fonseca, J. Santos, V. with the help of two technologies namely Embedded system and Biometrics [4]. Meenakshi P. et.al. have put up the idea in her project

that can check the status of hostel rooms at anytime from anywhere only by internet. This can keep track of number of student in the hostel rooms and also saves the electricity according to the presence or absence of students in the room [5].

Problem Statement:

The system will be able to produce the students' attendance report thus reducing the need for manual labor which is prone to human errors and time consuming. The Student Attendance will be based on the department and section. The student and staff have unique user login id and password available. The student can view the attendance record on weekly, monthly, and whole semester basis. The staff can view as well as modify the attendance record when in need.

Proposed System:

RF modules based attendance system is quite simple technology that minimize the time to take and maintain the attendance of each class in school, colleges or unit. Each student provided a special module with unique identification code related their respective classroom to get noticed by attendance system. When student will enter in class he/her have to press button on RF module to get recognized by his/her respective classroom at the same time LDR at the door will recognize the entry count and the receiver will receive the unique code of student RF module. If the student from class A will enter in classroom B then his/her attendance will not recognized by the system. These system will reduced the time and effort require to maintain daily attendance of each class and also capable to provide students daily/monthly records in a scale of percentage. Printing facility for attendance record is available for staff/admin.

III. METHODOLOGY

System block diagram & description:

It describes the detail of the Automatic attendance system with path following technology methodologies with modules and their interfacing. Details of modules and technology make to understand how data collection, recognition and operation of system may occur. In this project we have used RF ASK343K module for wireless attendance system Radio-frequency (RF) is a technology that uses radio waves to transfer data from an electronic circuit, called RF tx module, attached to an object, through a reader for the purpose of identifying and tracking the object. Radio frequency (RF) is a matured technology that incorporates the use of electromagnetic or

electrostatic coupling in the radio frequency portion of the electromagnetic spectrum to uniquely identify an object, animal, or person. RF chips contain a radio transmitter that emits a coded identification number when queried by a reader device. In this application we are using Matlab interface for attendance system and USB to TTL converter.

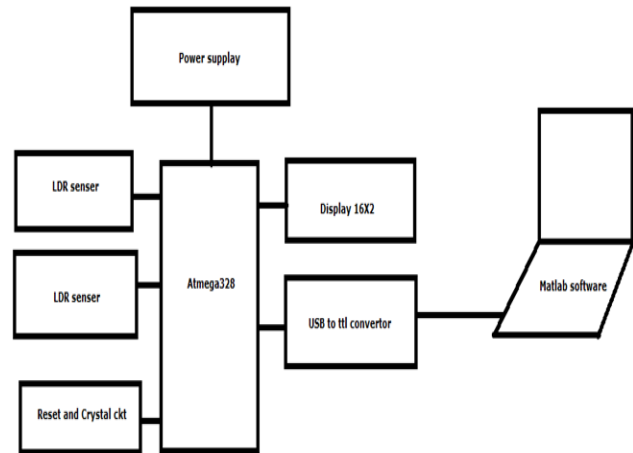


Fig. 1 Block diagram of the proposed system

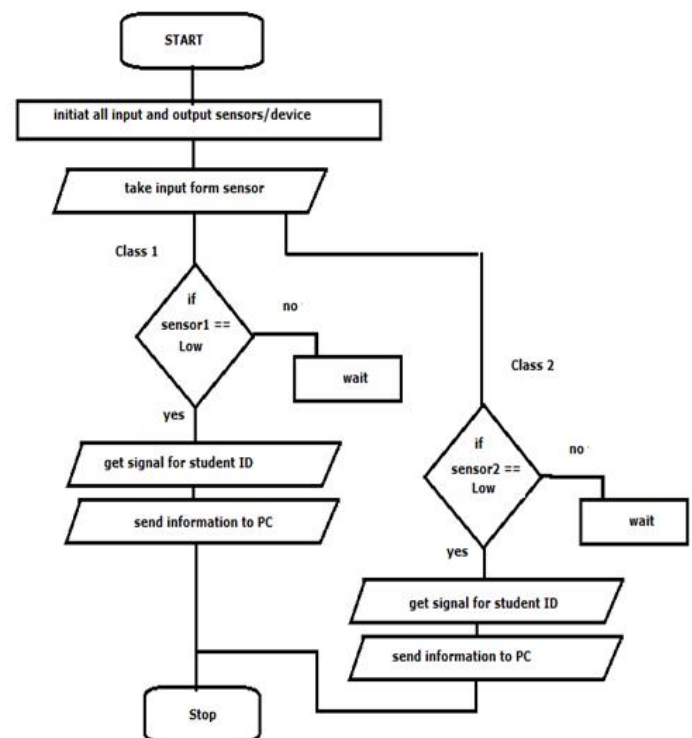


Fig. 2 System Flow diagram

System Flow Diagram:

Algorithm:

1. Start
2. Initiate all inputs & output of system

3. Take inputs from sensor
4. If sensor 1 is ON then it will be receive the signals from classroom 1 student's id and reject other signals, same for sensor 2.
5. Receive the information in student's id
6. Transfer information to pc
7. Stop

IV. RESULT AND DISCUSSION

When student want to enter in the classroom, he want to press the buttons on the id module provided(RF transmitter).Then the RF receiver module will receive the specific code of student id and the LDR at the door will count the entry of student in the classroom. Here one authentication will be provided by the system is the student in classroom A will be count as present only when he will enter in classroom A or that entry will be discarded but the count will be taken as the total entry in classroom. Following are the screen shots of Matlab view about the system changes while the entry of each student and the managed display of daily or monthly record of each student.

As shown in Figure 1, these transmitter unit provided at student side with a unique address to recognized in specific classroom.

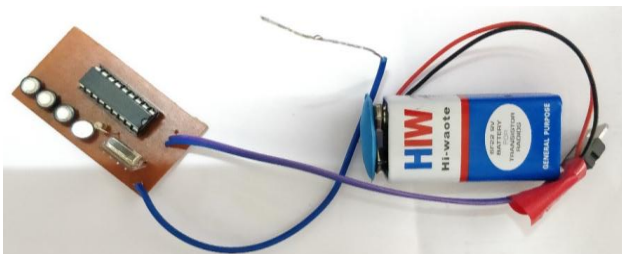


Fig 1: Transmitter at student's side

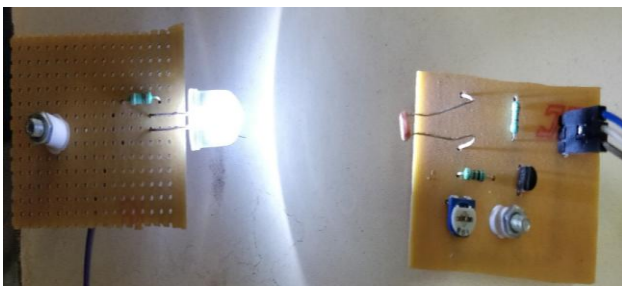


Fig 2: Circuit for count student's entry

As shown in Figure 2, it's a mechanism developed by using LDR and LED to count student entry in classroom.

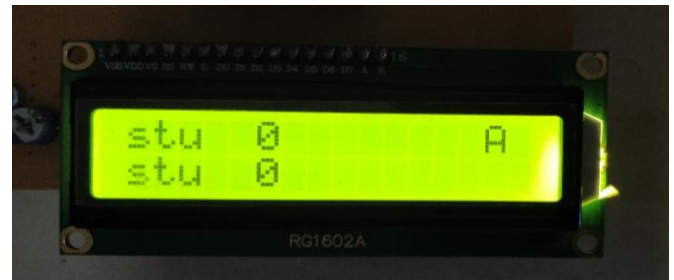


Fig 3: Display at null count

As shown in above Figure 3, display is in null position these will indicate that no student is present in classroom.

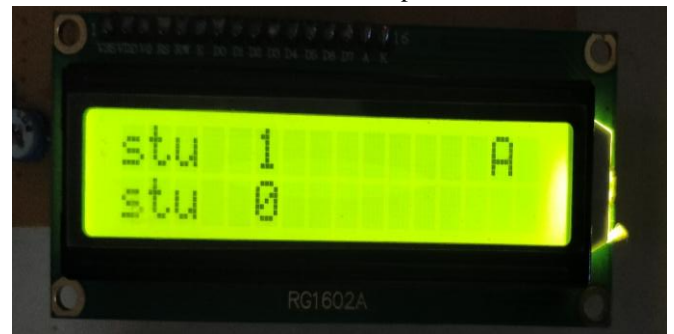


Fig 4: Display after first entry in classroom A

As shown in Figure 4, display shows the entry of student recognised in classroom A.

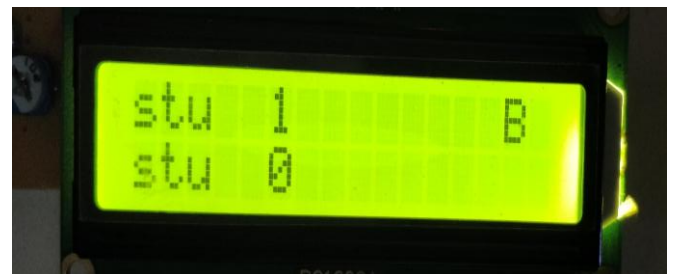


Fig 5: Display after first entry in classroom B

As shown in figure 5 display shows the entry of student recognised in classroom A.

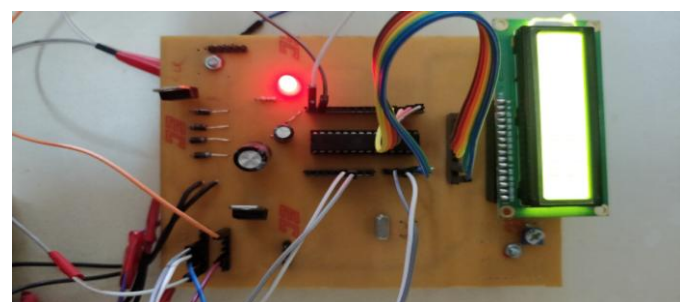


Fig 6: Receiver unit

As shown in Figure 6, receiver unit is designed to receive the signals transmitted by the receiver presented at student's side.

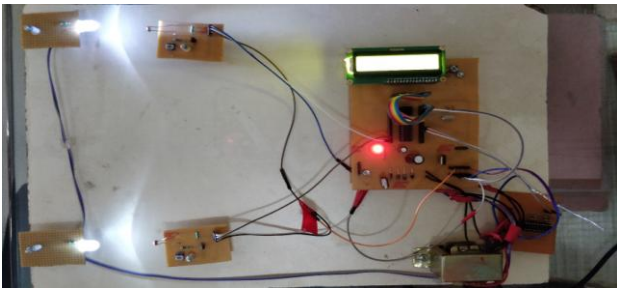


Fig. 7: Total unit

Total unit with the transmitter, receiver and the LED display is shown in figure 7.

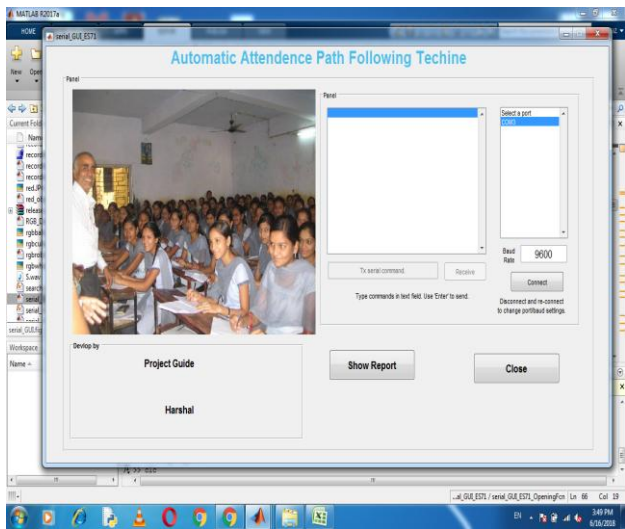


Fig. 8: Matlab view of Automatic attendance system chart

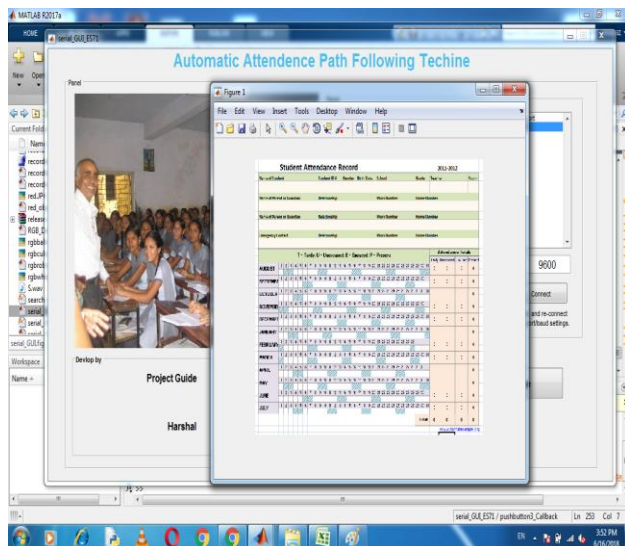


Fig. 9: Matlab view of Automatic attendance system chart

Attendance system with path following technology consist of the auto attendance system and automatically generated daily and monthly reports of attendance and the path following technology which consist of the part after

finished the attendance deals with the path following mechanism, If we want to know the exact place of student the we have to enter his/her name in system then system will show the current location of that person with time count. This path following mechanism is under process for complete the system.

Attendance system with path following technology consist of the auto attendance system and automatically generated daily and monthly reports of attendance and the path following technology which consist of the part after finished the attendance deals with the path following mechanism, If we want to know the exact place of student the we have to enter his/her name in system then system will show the current location of that person with time count.

Student Attendance Record							2011-2012																												
Name of Student	Student ID #	Gender	Birth Date	School	Grade	Teacher	Room																												
Name of Parent or Guardian		Relationship	Work Number	Home Number																															
Name of Parent or Guardian		Relationship	Work Number	Home Number																															
Emergency Contact		Relationship	Work Number	Home Number																															
							T = Tardy; U = Unexcused; E = Excused; P = Present																												
							Attendance Totals																												
							Tardy	Unexcused	Excused	Present																									
AUGUST	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	0	0	0	0
SEPTEMBER	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	0	0	0	0	
OCTOBER	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	0	0	0	0
NOVEMBER	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	0	0	0	0	
DECEMBER	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	0	0	0	0
JANUARY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	0	0	0	0
FEBRUARY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	0	0	0	0			
MARCH	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	0	0	0	0
APRIL	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	0	0	0	0	
MAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	0	0	0	0
JUNE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	0	0	0	0	
JULY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	0	0	0	0
							Total	0	0	0	0																								

Fig. 10: Attendance chart

V. CONCLUSION & FUTURE SCOPE

This system provides an effective and more convenient method of taking attendance when compared to the manual system. In terms of performance and efficiency, this project has provided a convenient method of attendance marking compared to the traditional method of attendance system. By using databases, the data is more organized. This system is also a user friendly system as data manipulation and retrieval can be done via the interface, making it a universal attendance system. Thus, it can be implemented in either an academic institution or in organizations.

Future Scope:

In future this system can be advanced by using biometric or solar powered transmitter at student's side, which helps to provides more accuracy and security to the student's

attendance and also we can add the text message tool to provide the students daily attendance to parent.

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