A NOVEL AI AND RF TUTORED STUDENT LOCATING SYSTEM VIA UNSUPERVISED DATASET

1RATHEESHKUMAR A.M, 2DR. D SUDHARSON, 3P. DIVYA, 4DR. SAKTHI GOVINDARAJU

1Assistant Professor, Department of Information Technology, Sri Krishna College of Engineering and Technology, ratheeshkumar@skcet.ac.in.
2Assistant Professor, Department of AI&DS, Kumaraguru College of Technology, sudharsonswich@gmail.com.
3Assistant Professor, Department of Computer Science and Engineering, Bannari Amman Institute of Technology, divisrecme@gmail.com.
4Assistant Professor, Hindusthan College of Engineering and Technology, sakthihit@gmail.com.

ABSTRACT

Our work is a result of an insight to a specific problem faced by kindergarten children or kids under 12 years when they are at school and in their everyday life. This paper is proposed to design and implement a system that is done by the recordings at the entry and exit with the help of RF. This ensures the safety of the students. The proposed system notifies the parents when they enter and leave the school via mobile text messages with the help of GSM. The system uses fingerprint verification as a part for locking and unlocking the student band which is worn by each and every student. Therefore, with the help of the proposed system safety of the kindergarten children or kids under 12 years (i.e school student’s) is enhanced. In order to evaluate the proposed technique, an experiment is run and the result is acceptable.

I. INTRODUCTION

The Internet of Things (IOT) plays a critical role in the advancement of innovative technologies in today’s world, and helps to build and incorporate different concepts. The definition of IOT is used in an advanced and practical way here. Nowadays IOT becomes so significant that it has the ability to represent itself digitally. IOT makes the physical world as a one big information system. The role of IOT in our proposal “RF based Student Tracking System” is huge.

Security and health are the biggest threats faced in today’s world by the children or school students. Statistical study says that every year about 50,000 children are missing, of which 42 per cent are not identified. An article published in India says that a child is missing in every eight minutes a data released by the national office for criminal records. There are several problems that may present.

The project proposed is done to initiate the safety for students in terms of security that can keep their parents free from worries. This also ensures that their parents can be able to know that their wards are safe. As mentioned it is done with the help of automatic entry and exit recordings that are created with some criterion. It will in turn have a positive impact in the family.

The system is designed in such a way that it captures unique information of every student using an RF tag that will interchange the data with the reader through the radio waves or a sensor that interacts with the microcontroller. The parents will receive message if their children entered the school, through a GSM module connected with the watch like system in student’s hand.

System uses RF technology to track the student. Radio frequency (RF) is a technology that transmits data using radio waves from an RF tag attached to an object by the reader for tracking and identifying objects. RF system contains two main components: the reader and the tags. The tag is usually attached to the objects to be monitored.
and carries information in a microchip. The reader on the other hand detects tags that are within it frequency limit and writes to or read from the tags.

Fingerprints are the major part in this system as it can be unique and added along with fingerprint classifications called Henry classes. This system includes all the mentioned to help parents to track their children in real time. The data collected are sent in the form of SMS when the child enters or leaves the school premises. The enhanced fingerprint image increases performance and also decreases the overall system percentage without the need for a estimation.

Fig - Fingerprint Classes: (a) Tented Arch (b) Arch (c) Right loop (d) Left loop (e) Whorl

II. LITERATURE SURVEY

[1] A. Al-Mazloum and others in (2013) and Rohit N. Bhoi and colleges in (2015) developed a system to aim locating missing or lost children using mobile smart phone.

[2] The most related work regarding the issue intended by this project is presented in this segment. The author Saranya proposes a framework that traces location of youngsters using a child module that transmits the following data to a database and a cell phone. The drawback of this framework is that the module may not be suitable for children and wide-scale deployment is costly.


III. EXISTING SYSTEM

“Letstrack personal” is an established system of our proposed system where it is an innovative GPS tracking device by Letstrack limited. In this existing system we need to connect the device to the Letstrack app which in turn lets you track your loved ones instantly. It is not in the wearable form and cannot handled by the small kids it remains only handy for the people above 12 years could be placed in a bag or fasten to a child’s belt.

And there is also an another existing system which is in wearable form as like the band but it does not exist in a secured way (i.e) the children can remove it from their hand whenever they want where it will not satisfy parents and the children’s safety to the full. The existing system uses RFID to track the children’s safety.

Fig - Existing system

IV. PROPOSED SYSTEM

The proposed system uses fingerprint sensor for unique identification of the band. The parent keeps their fingerprint on the band and then locks the band on their child’s hand before he or she leaves the home[21][22].

www.turkjphysiotherrehabil.org
Once he or she enters the school a text message is sent to the parents that their child has been entered the school campus. Also when he or she gets out of the school campus a message is sent to the parents that their child has left the school campus.

In any case, if a student tries to remove the band alert message is sent to the parents immediately so that parents and school management can take necessary actions immediately to protect the child. This can be more helpful when the children have been kidnapped and parents can take appropriate actions regarding this. With this system parents can monitor their child at their places.

**WORKING OF THE PROJECT:**

- Start the project by powering up the controller.
- Upload the program to both the transmitter side and receiver side using Arduino IDE.
- Store the fingerprint of the parent in the fingerprint sensor.
- It helps to identify if any unauthorized person other than the parent is trying to unlock the band, fingerprint not matched message will be displayed on the serial monitor as that they cannot proceed the final process.
- If a student tries to remove the band without authorized fingerprint then the “Alert” message will be sent to the parent and also will be displayed in the serial monitor.
- If a student entered the school campus, then “In campus” message will be sent to the parent and also “Student present” will be displayed on the LCD display.
- If a student leaves the school campus, then “Out of campus” message will be sent to the parent and also “Student Absent” will be displayed on
- the LCD display.

The architecture consists of two main modules they are :

- Transmitter Side
- Receiver Side

The transmitter side is present on the student band and the receiver side is present on the campus gate.

**V. MODULE DESCRIPTION**

**TRANSMITTER MODULE:**
Transmitter consists of Arduino, GSM, Trigger Pin, RF transmitter and a fingerprint sensor. The transmitter transmits the radio frequency signal at a particular range continuously. The signal transmitted will be received by the microcontroller and the controller sends it to the receiver when the both transmitter and receiver are in the range[23][24]. The transmitted signal is then received by the receiver which is present in the school campus gate When the receiver receives the signal the controller in the transmitter side identifies that the signal is received in the receiver side and alerts the parents with the notification SMS generated by GSM attached in the transmitter side. The alert is sent to the parents notifying about their child’s presence.
RECEIVER MODULE:

Receiver end consists of LCD display, GSM, Arduino and a RF receiver. The receiver receives the signal with the help of controller when the transmitter comes nearer to it. When the student tries to get out of the campus the RF signal again gets sync and the GSM in the receiver side sends alert to the parents notifying that the student as left the school. It also displays the result in the LCD display.

FINGERPRINT SENSOR AND TRIGGER MODULE:

In this module there is a trigger pin where it implies the working of locking and unlocking the band in the Student’s hand. The Fingerprint sensor is attached in the project which helps the parents to lock the band in the Student’s hand. The fingerprint of the parents is mandatory in our system to remove or to wear the band in the Student’s hand. This facility makes the project efficient as that no one can remove the band from the student’s hand unnecessarily.

Here the trigger pin acts as the locking part and when anyone tries to pull it with the mismatching fingerprint then it sends the alert to the parents notifying the activity and so that the parents can take respective actions. In case of correct match of finger print no alert is sent and it means that the parents are removing the band from the student’s hand.

V. RESULTS

Fig-Prototype of RF based student tracking system
VI. CONCLUSION AND FUTURE WORK

It is a high risk in today's world as it is unsafe for children. We have come across cases where students are kidnapped and abused in everyday news. This system is highly effective for the monitoring of students. Modern technologies like RF suitably controlled and details are sending to mobile phones of parent by utilizing IOT.

It also reduces the fact to personally monitor the students and tracing them manually during their way to and from schools. In this research, a new technique has been proposed along with the existing ideas to protect children (i.e.) the Fingerprint authentication of the parents that might be tracking the entering and leaving activities of the children at school. In this case, the parents will now feel more comfortable about the safety of their children on their school hours. This approach uses fingerprint image enhancement without depending on the orientation estimation.

This system also makes use of affordable components such as RF, Arduino, GSM, LCD display and fingerprint sensor. This project provides the design which has the advantages of low cost, portability and small size. Experimental work has been carried out carefully. This system also will have broad application prospects and it will play an important role in day to day life in future and present.

Our system will be an efficient, user friendly and safer device to provide safety for the school going students. Our motto is to protect our future generations from the unnecessary activities and to make them and their parents to be in the comfort level.

FUTURE WORK
➢ The future enhancements or advancements expected to be implemented in our project are the above discussed idea can be made even more effective and to work with accuracy using RFID tags.
➢ The additional facilities like smart bus tracking can also be added to it (i.e.) The smart bus tracking process provides parents, students and school service firms with the capability to track accurately the location of the Student’s mobile school service vehicles.
➢ By combining this concept with our idea they can track their kids continuously from home to school and vice versa. Therefore, on the whole the safety of the children can be monitored or tracked easily.
➢ Attendance monitoring process can also be added to this project by providing facilities like automatic updation of attendance in the school management’s server instead of updating it manually.
➢ It can also help them in generating the annual or monthly reports.

REFERENCES