

SECURITY ENHANCED SCHOOL BAG

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Abstract—Recently, abuses against children have increased and Child security gained more importance. Another main problem is heaviness of their school bags. Incorporating technologies like Global Positioning System (GPS) for tracking, Global System for Mobile(GSM) and Radio Frequency Identification (RFID) technology for timetable assistance can be used to disentangle these problems. In this proposed system, a raspberry-pi along with GPS, RFID, and Camera is used for tracking and timetable assistance. GPS system persistently tracks child and saves position coordinates in its database. The saved coordinate is sent to the parent via email when child goes out of provided zone or panic button becomes active. When panic button is pressed camera capture picture of surroundings and send it along with the position coordinates to the parent. RFID is used to assists pupil in their time-table management. Time-table schedule is stored in the database. Tag reader identifies books according to the schedule saved in the memory. The system integrates both security and assistance for children.

Keywords—*raspberry-pi, Arduino, RFID, GPS, camera, intelligent system, security, safety.*

I. INTRODUCTION

In education structure the learners has to carry their bag daily. Due to the weightage of the bag the student can cause shoulder pain, tiredness, aching muscles etc. By implementing this technology, the weightage of the school bag would be reduced by setting certain timetable of the current date. This is not only the problem faced by the children, their security is also an important factor. Kidnapping, molestation and sexual abuse of school going children are increasing at an alarming rate. According to this certain case studies done and found that unsecure problem. There is a need of sensible answer to the current drawback. Therefore, the parents would possibly be able to understand the whereabouts of their kids.

In smart school bag, here system uses RFID tags and RFID reader. Each and every book that the student possesses is labeled with a tag with unique ID. The RFID reader identifies the books by unique ID. The bag is supplied with a panic button within the reach of the child, which triggers the panic mode once pressed. On activation of panic mode, the camera connected to the system takes photos of surroundings and therefore the GPS module collects the location coordinates of the student and transfer identical to the minicomputer and from there the alert notification is sent to the parent/guardian. The related works are explained in section II. Section III deals with methodology used in the proposed system. Result and discussion are mentioned in section IV

II. RELATED WORKS

One of the early works in child security was “School Zone Safety System with Wireless Sensor Network” [1]. This project included a sensor network and a management system. The sensor network was divided into two sub systems they are as follows, Parking Control sub network consist of sensors for Detecting illegally parked or stopped vehicles and a warning system to warn the driver. The second sub system is the vehicle speed control sub network which measures speed of passing vehicle and if the vehicle is over speeding it activates warning system. One of drawbacks of the system was warning system was not that much effective in reduction of accidents. A similar work in the same field was” Children Tracking System Using Arm7 Microcontroller” [2]. It tracks location of a child’s position constantly and the location is sent to parent. Here the proposed system tracks the location of child using GPS module and the coordinate values are sent using a GSM module. A major setback is that the system is integrated to the bag and missing of the child’s bag compromises the entire system. A more recent work was “Smart Tracking System For School Buses Using Rfid Technology” [3]. Here communication between applied tag and a reader relies on RFID technology.

An RFID Reader module placed at school bus door and Passive RFID tags provided to children. Data of children boarding a bus is provided in database of the main system RFID reader reads the tag and marks the presence the of child in the bus.

III. METHODOLOGY

The proposed system mainly concentrates in security and time table assistance of the child. For this purpose, to be carried out efficiently the system works in two modes namely(a)Monitoring mode (b)Timetable mode

The two modes can be selected using the mode select switch that is provides in the system. Upon selection, the system works accordingly as the coded program in the system.

In monitoring mode, the system waits for the signal from the processors and when the panic button is pressed email containing the image of the attacker and the current coordinates of the child are send to the registered email address of the parent. The processor continues to send the coordinates of the child to the registered mobile number of the parent through a GSM module integrated with the system. This happens after the panic button is pressed by child.

In timetable mode, timetable is saved in the system memory and RFID tags are attached to note books of each subject the RFID reader module first determines the day and then the books are identified according as the saved time table. The day selection is

done by the select switch provided by the processor. Parents can select this mode and before going to school the system can be put back to the monitoring mode

As for the protection of the child it's not safe to keep our system only in the bag. The main concern about tracking was if the tracking module is placed in the bag there can be chances for the separation of the bag from the child at the time of an attack. Keeping the panic button in the bag section was not a promising option because the panic button is the one that triggers all the sub systems of proposed system. To avoiding such an event will increase the efficiency of the system and for this the hardware of the proposed system is divided into two sections they are shown in the figure1.

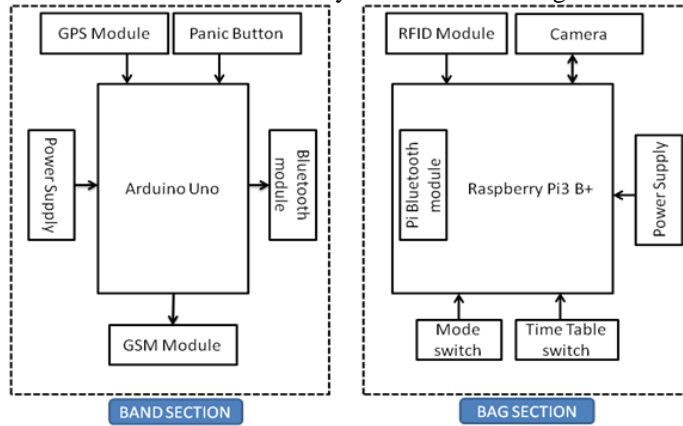


Figure 1. block diagram

The two main section of the system are (a) Bag section

(b) Band section. The bag section contains hardware for image capturing, timetable management and communication between bag section and the parent. It also incorporates mode select switch and time table selection switch. The raspberry pi module integrates the GSM module, camera module and a Bluetooth module to connect between the bag section and the band section of the system. A camera is used to capture the image of the child's surrounding when the panic button is pressed the image is saved in the memory of the processor.

When the panic button is pressed the band section gets triggered and the paired Bluetooth modules exchanges information about the current location of the child to the bag section. This information is then added to the e-mail address of the parent with the camera captured image. This process works in the monitoring mode of the proposed system. When the system works in the timetable mode the only module working will be the RFID module when day selection input is detected by the processor in the bag section the RFID reader module gets started and waits for the book to be read. When the book is read, the led indication bulb will glow once for the correct book in the time table saved and the bulb glows twice if it is a wrong book.

IV. RESULT AND DISCUSSION

In the proposed system there were two sections the bag section and the band section. The final prototype of the system was made and this can be integrated with the school bag later. Figure2 shows the prototype of the bag section. The prototype of the band section is shown on figure3. Screenshot of the email send to the parents is shown in figure 4.



Figure 2 prototype of bag section

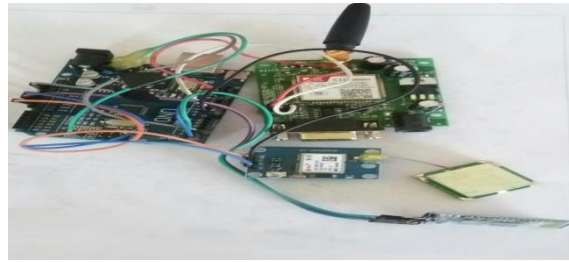


Figure 3 prototype of band section

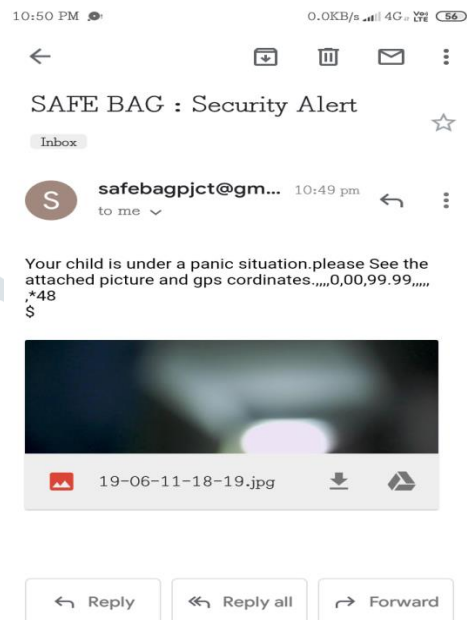


Figure 4. Screenshot of the email

V. CONCLUSION

The developed system is can be integrated to a normal bag. The smart school bag implements the utilization of real time system for the correct functioning of the RFID system. As soon as the student presses the panic button his GPS coordinates and the image is sent to the email id of the parent. In future the proposed methodology can be modified by introducing the automatic attendance-uploading feature and sending assignments and project details to the smart school bag.

VI. REFERENCES

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