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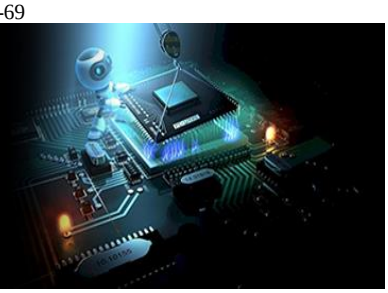

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Aizaz Ahmad
Department of Computer Applications, Tula's Institute, Dehradun, Uttarakhand, India

Corresponding Author:
Aizaz Ahmad
Department of Computer Applications, Tula's Institute, Dehradun, Uttarakhand, India

Smart beloved tracking system with IoT features

Aizaz Ahmad

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Abstract
The issue concerning children due to abduction, disappearance and threats were of great concern to the parent. Daily surveillance of their kids would seem incredibly difficult for working parents when safeguarding their kids. Therefore, a smart beloved tracking system (BTS) is developed to protect children from emergencies whenever pressing the button. The system comprises of the Arduino-nano board and a GSM with an OLED display and then further equipped with SMS notification function to send a SMS to the parent. The goal is to build a portable device related to the safety of the child and to establish a notification system for alerting the current position and to send SMS to parents whenever the child feels unsafe. Wide communication coverage by using GSM features in comparison with Bluetooth communication and appealing compared with the current monitoring unit on the market. BTS prototyping has demonstrated the ability to manufacture the proposed design and successfully demonstrate the ability to track children.

Keywords: Child tracker, GSM system, remote monitoring

Introduction
In today's world, children's protection has become a big concern because they cannot leave their homes at any given time because of physical or sexual abuse and fear of crime. Even in the 21st century where the technology is rapidly growing, and new gadgets were developed but still children are facing problems. The world is becoming increasingly dangerous for children in all ways, and violence against them is growing at a higher pace. We are all aware of importance of children safety, but we must examine that they should be properly protected. Children are not as fit physically as an adult, and support must be needed in an emergency. One of the worst nightmares for parents is that their children are lost and difficulty to track their location. Therefore, this system is developed to incorporate the device connected to the children which equipped with emergency button. The main aim of this system is to intimate parents and police about the children's current condition by creating the GPS system to map the child's current location and the GSM modem is used to transmit a message to the parents predefined numbers. Finally, the project aims to design a low-cost safety device by using Arduino- nano which allow greater reliability of sending data. Therefore, this project will help to trace and locate missing children by sending the data location of their children to parents using SMS when the button is pressed by their children when they are in trouble.

Methodology
The proposed BTS is intended to locate the children, which initiate the tracking function when the child clicks a button. As depicted in Figure 1, when the button is pressed, the micro controller receives the signal, and the GPS device presents the location\ information. Arduino-nano was then allowing the GSM system to\ transmit the warning message to the parent‘s cell phone and view the tracked location. In addition, the OLED display which is attached to the BTS provides the status of the children. The flow chart of the overall BTS initialised with the state of the children, whether they are in trouble condition. Whenever the children feel comfortable, the system remains inactive while keep looping. However, when the children were found in emergency, the GPS works to track the current location after the emergency button was pressed. Next, GSM turned on to send a message to their parent with coordinate location retrieved by the GPS. The OLED on the BTS also demonstrate the status of the message sent. To realise the design of BTS, the schematic diagram shown in the

Figure 2. All main components were connected to the Arduino-nano. Manual placement and footprint design were created specifically in Proteus software.

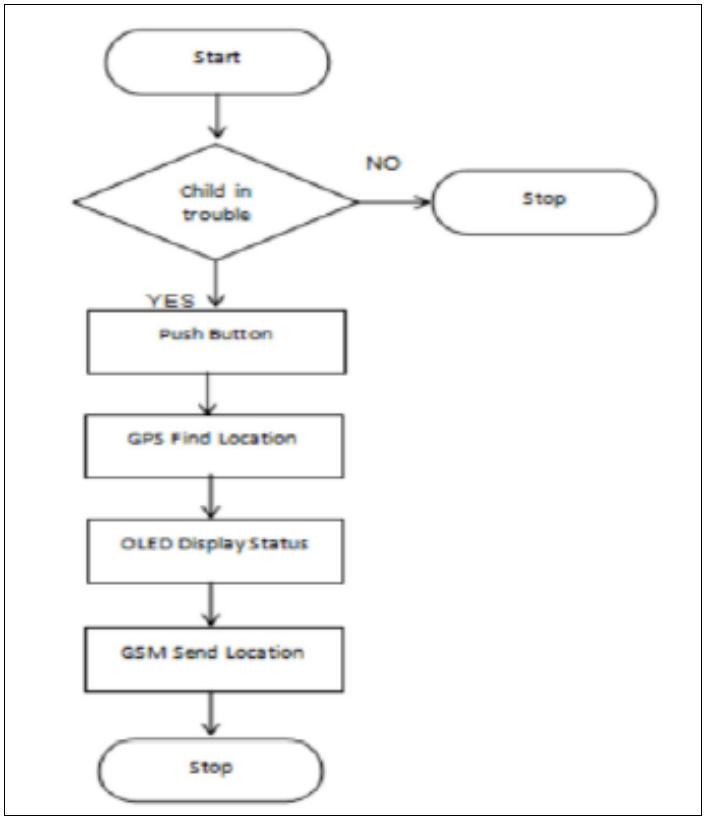

Fig 1: The flowchart of BTS

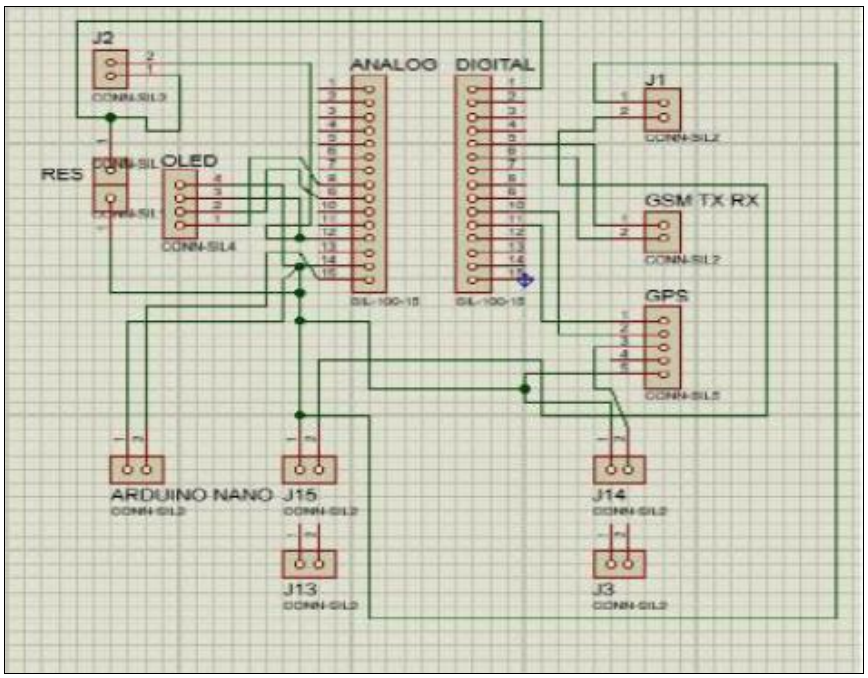

Fig 2: Schematic Diagram of Project System

Results and Discussion

After the hardware is designed, simulation within the Proteus software is developed and tested until all components are integrated. The initial test to establish a simple project connection was to observe how the actual hardware would work. The system algorithm was then placed in the source code section. Due to the limitation of the library, the total simulation of the project cannot be completed, but the basic circuit test has demonstrated the design applicability as shown in Figure 3.

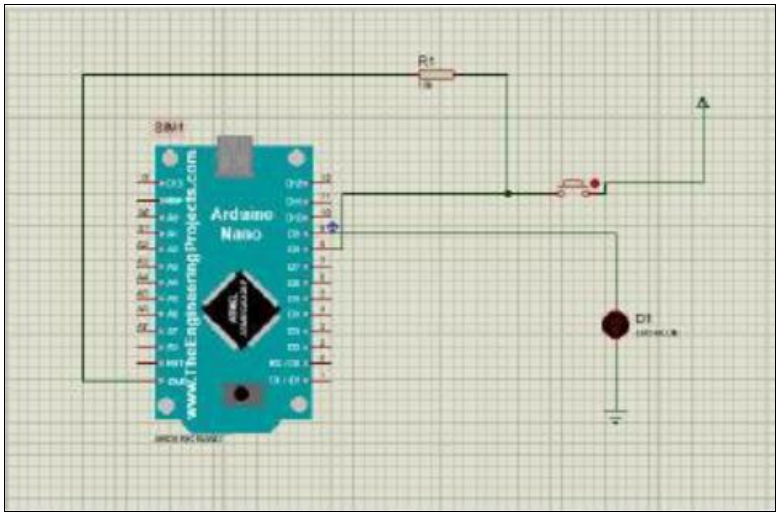

Fig 3: Functionality test circuitry

Figure 3 displays the test circuitry to simulate the input and output components represented by the button and the LED. The push button was interfaced with Arduino-nano and GPS SKM53 as communication medium to send SMS. When the button is pressed, the LED light has been successfully simulated. The final product of the project prototype is shown in Figure 4.

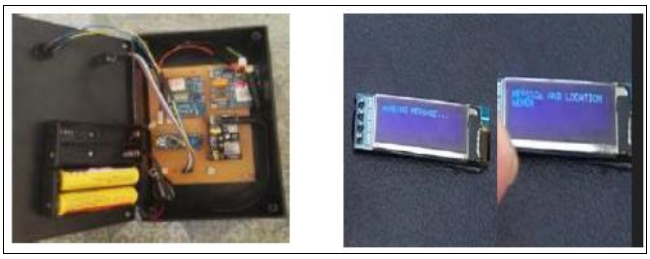

Fig 4: Actual prototype

The OLED display showed the warning of Beloved Tracker when\ there is no button is pressed, however in vice versa, GSM will send the location provided by GPS to the child's parent, and simultaneously the message on OLED displaying of Send Message and Send Message and Location within five seconds. As result, the successfully of BTS in sending the child location directly to the parent phone shown in Figure 5 to verify the detected location at PTDI, UITM Pair Gudang, Johor.

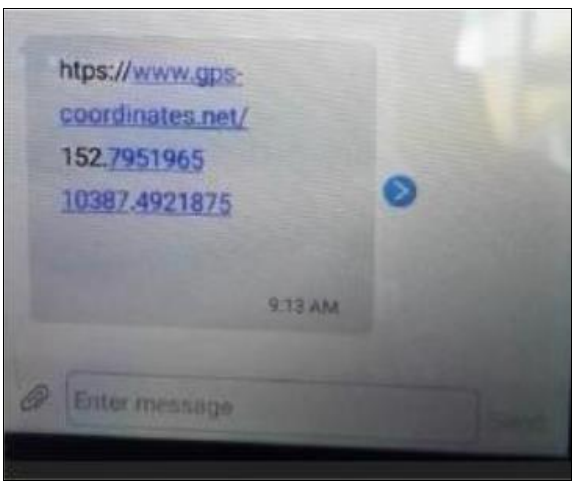

Fig 5: Coordinate captured at the location tested

Conclusion

In conclusion, the project has been successfully completed as the planned outcome. The BTS has been designed to be able to send the longitude and latitude position to the mobile phone. It can also be summarised that our project can be programmed, planned and constructed using a low-cost Arduino-nano microcontroller and other components. Improvements or suggestions to minimise size and improve design are proposed. The current design consists of bulky and large prototyping due to the location of the battery, thus requiring better design and configuration of the components.

Acknowledgment

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