Implementation of IoT in Child Safety Wearable Gadget Using Wireless Technology with Android Application

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***Abstract*— The main aim of the project is to provide security to the child. For this to be achieved, we use wearable device which help the parents to get notified if the child faces any unusual situation. It instantly reacts for child's safety until the parents arrive or it could apprise the parents and help to locate them. It is implemented using a Raspberry Pi3 and the sensors. Sensors collect data and store in the server which can be sent to parents through android application. It includes bright SOS light and distress alarm buzzer. The aim of this project is to provide security to the child in real time and also helps parents to observe the child's condition using android application.**

***Keywords*— IOT, Child, Raspberry Pi3, Safety, Wearable**

I. INTRODUCTION

The main aim of this project is to provide safety to child using smart IoT wearable gadget and android application. The Internet of Things System (IoT) refers to set of devices and systems that stay interconnected with real-world sensors and actuators to the Internet. The motivation for this wearable comes from the increasing need for safety for little children in current times as there could be scenarios of the child getting lost in the major crowded areas. The proposed system focuses on the key aspect that the lost child can be helped by the people around the child and can play a significant role in the child's safety until reunited with the parents. In this project we use SMS as the mode of communication between the parent and child's wearable device, as this has fewer chances of failing when compared to Wi-Fi and Bluetooth. The platform on which the project will be running is Raspberry Pi3 board. The sending and receiving SMS, connecting to the internet is provided by Raspberry Pi3.

1.1 Problem Statement

The increasing need for protection of the child at present times and also when child can be lost in crowded areas. Using Bluetooth and Wi-Fi not possible to track larger distance.

1.2 Solution Statement

Wearable gadget which tracks health conditions of the child using temperature, heartbeat and accelerometer sensor and sends notifications to parents about child's health conditions through android mobile application.

1.3 Objectives

Protection of child using wearable gadget which keeps track on health condition and android application for parents to monitor the child's activities.

1.4 Scopes

The wearable gadget acts as a smart IoT device. Gives real-time location and monitors child's health condition.

II. WORKING

Raspberry Pi3 fetches various kinds of data from different modules which are interfaced to it. The GSM shield which is used as a interface to send the data is received by the Raspberry Pi3 via SMS to the smartphone. Temperature sensor is connected to Raspberry Pi3 which gives the ambient temperature. GPS Location sensor determines the real-time location of the child. Ultrasonic sensor and IR detects the obstacles that are near the child. Accelerometer sensor which is also known as mems sensor isused for tilt sensing applications which provides the dynamic acceleration resulting from motion of the child. Heartbeat sensor gives the heartbeat rate of the child. SOS light and distress alarm buzzer emits a strong tone which alerts the bystanders who can rescue the child when in danger. The gadget also uses the android application only with specified keywords such as "SOS","TEMPERATURE","BUZZ". If any of these keywords are pressed by the parent, they will get notified through the SMS through their smartphone. The protocol used here is UART (Universal Asynchronous Receiving and Transmission) protocol to communicate with one device to another.

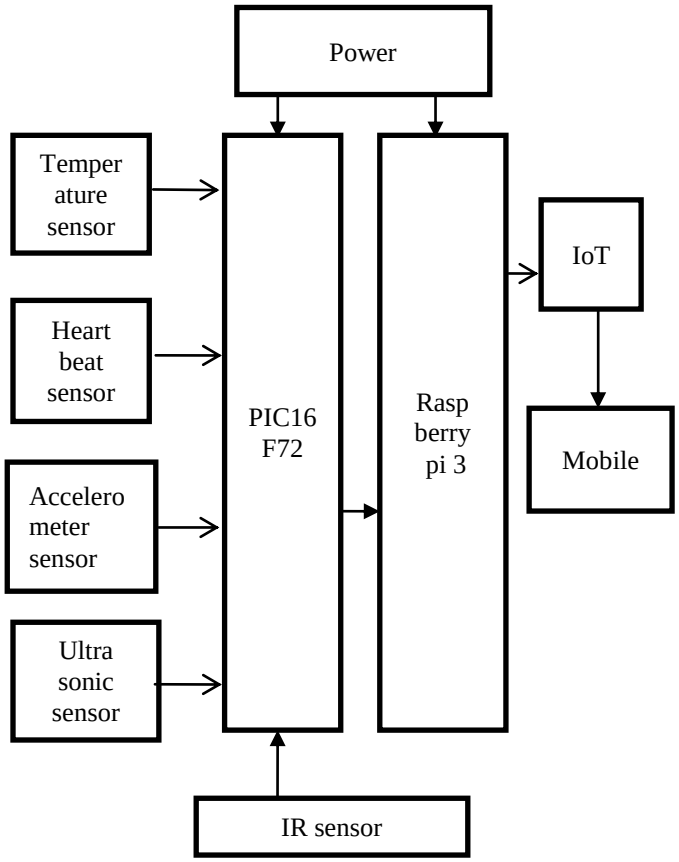

Fig. 1 System overview of the wearable gadget

2.1. Hardware Interfaces

1. Raspberry Pi.
2. IR Sensor.
3. Heartbeat Sensor.
4. Ultrasonic Sensor.
5. Accelerometer Sensor.
6. Temperature Sensor.
7. Analog to Digital Convertor Circuit (PIC 16F72)
8. Mobile.

2.2. Software Interfaces

1. Programming Language: Python
2. Tool to be used: VNC.
3. Operating System: Windows

III. CONCLUSION

This project will be helpful for children when they are in major crowded areas as well as when they are alone at their home. With the help of sensors embedded in the wearable gadget and android application the parents can keep track of health conditions of the child .This project eliminates unreliable mode of transmission of sending and receiving messages and helps parents to locate their children when in distress.

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