An Integrated Child Safety Monitoring Device using WSN Technology

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Abstract:
It is known that the technological developments are growing at a quicker pace. But the application of technologies in numerous sectors is very less. We know that people of different age group face different difficulties. But the security for children is very low. There are a lot of cases registered regarding child safety. Now a days, the parents are very much worried about their children. So, the safety and monitoring the children is very much difficult. In this project we are introducing the IOT based embedded system. So, we propose a system to continuously monitor the parameters of the child and also their location for safety purpose. The system provides smart child tracking and monitoring system.

Keywords: wireless sensor network, flex sensor and force sensor, buzzer.

I. INTRODUCTION
The popularity of smart hand held devices and the development of wearable devices have made crowd sourced sensing networks possible, which can explore the real-time mobility of smart phone users, the sensing capability of wearable devices, and the diverse communication between wearable devices and surrounding smart phones to achieve pervasive sensing results. Environmental information and individual status can be less expensively collected and more efficiently distributed for living quality, personal safety, and mobility efficiency such as air quality detection, children status monitoring. For the safety of children, several works have been proposed to monitor the locations and activities of target children based on outdoor GPS or indoor IOT localization technologies. If the potential safety risks are detected, alert messages are sent to notify parents or guardians for taking necessary actions and to warn children from stopping dangerous behaviors. However, most of the children monitoring systems cannot recognize abnormal postures of monitored children in a real time manner, and none of existing systems provide lost children finding in a crowd sourced sensing manner.

II. OBJECTIVE
We are continuously tracking the children. We are providing wearable sensors for every child for continuous monitoring.

III. EXISTING SYSTEM
There are few systems utilize sensors for monitoring the child parameters. But there is no communication had been used to alert the parents. Because of this the health status of the children are not known by the parents. So, we are overcoming these drawbacks from the existing system.

IV. PROPOSED SYSTEM
In our proposed system, we are continuously tracking the children by using wireless signal. Here, our proposed system has two sections, one is child section the other one is parent section. We are providing wearable sensor for every child for continuous monitoring. When the child is with his parents, the wireless signals of child are connected with her parents. In case of emergency situations such as removal of wearable sensor or child out of range, are occurred, then alert will be provided to both child and parent.

V. SYSTEM ARCHITECTURE

VI. MODULES
• ARDUINO UNO
• LCD
• WSN MODULE
• FLEX SENSOR
• POWER SUPPLY
• BUZZER

A. ARDUINO UNO
Arduino is an open-source venture that twisted microcontroller-based tools for building numerical devices and collaborative objects that can intellect and control corporal devices. These
systems deliver sets of digital and analog input/output (I/O) pins that can border to various growth boards (termed shields) and other trips. The panels feature serial message interfaces, counting Universal Serial Bus (USB) on around models, for filling programs from private computers. Arduino Uno has a amount of amenities for interactive with a computer, additional Arduino board, or extra microcontrollers.

**Figure 2. Arduino UNO**

**B. LCD**

The most commonly used Character based LCD are based on Hitachi HD44780 controller or other which are compatible with HD44580. In this discussion group, we will discuss about charisma base LCD, their interfacing with numerous microcontrollers, programming, superior stuff and guiles you can do with these humble looking LCD which can give a new appearance to your application.

**Figure 3. Character LCD type HD44780 Pin diagram**

**C. WIRE LESS SENSOR NETWORKS**

A Wireless Sensor Network (WSN) is a hundreds of small, low-cost lumps that are fitted with limits in memory, energy, and processing size. In this specific form of systems, several difficulties to learn each node. Current developments in wireless infrastructures and electronics have allowable the roll-out of low-cost, low-power and multi-useful plans that are small in dimensions and join in a nutshell distance. Also, networked sensors use a broad range of applications within the defense area, generating new competences for investigation and surveillance and various tactical claims, intrusion detection, road traffic monitoring, health monitoring, inspection and observation.

**Figure 4. Wireless Sensor Network**

**D. FLEX SENSOR**

Spectra Symbol’s flex sensor is a 4.5 bendy substrate that stretches higher confrontation readings as it activates to a snigger radius. This 10 KΩ sensor has low power supplies for its output response. The resistance can increase up to 5 times the corrupt or flat state reading. Users can compute the degree of flexure or the bend radius using resistance. Common uses include calculating finger traction, robotics and gaming. The low outline of the flex sensor lets it to wrap around tops or to fit in tight spaces. By alifetoughness is suitable for many consumer applications. Flex sensors are inactive resistive diplomacies that can be used to detect winding or bending. It is a bi-directional flex sensor that reductions its resistance in amount to the sum it is bent in either way. The flex sensor attains countless form-factor on a thin flexible substrate. When the substrate is bent, the sensor products a resistance output connected to the bend radius the lesser the radius, the higher the resistance price. It can be interfaced with the microcontroller part. The yield from the device is analog.

**Figure 5. Flex Sensor**

**E. POWER SUPPLY**

The potential transformer will step down the power energy (0-230V) to (0-6V) level. Then the minor of the potential transformer will be linked to the accuracy rectifier, which is built with the assistance of op–amp. The rewards of using accuracy rectifier are it will give highest voltage output as DC time out of the circuits will stretch only RMS output. When four diodes are linked as shown in figure, the circuit is named as bridge rectifier. The input to the circuit is practical to the diagonally opposite bends of the network, and the output is taken from the residual two corners.

**Figure 6. Transformer**

Voltage regulators embrace a class of extensively used ICs. Regulator IC components cover the motherboard for orientation source, comparator amplifier, regulator device, and surplus protection all in a solitary IC. IC units deliver regulation of also a secure positive voltage, a secure negative voltage, or an adjustably set voltage. The controllers can be selected for process with load currents from hundreds of milli amperes to tens of amperes, consistent to power ratings from milli watts to tens of watts. Similarly, the sequence 79 regulators deliver secure negative regulated voltages from 5 to 24 volts.
F. BUZZER

A buzzer is an auditory signing device, which could be motorized, electromechanical or piezoelectric. Characteristic uses of buzzers and beepers contain alarm devices, timers and validation of user input such as a mouse snap or key stroke. Buzzer is an combined building of electrical transducers, DC power source, widely used in CPUs, printers, mimeographs, alarms, electronic toys, locomotive microelectronic equipment, phones, timers and other electrical products for sound campaigns. Active buzzer 5V Valued power can be straight connected to a incessant sound, this section dedicated sensor growth module and the board in mixture, can whole a simple circuit project, to “plug and play.”

VII. SOFTWARE DESCRIPTION

A. EMBEDDED C

High-level language software design has long stayed in use for surrounded-systemsgrowth. Though, assemblage programming still overwhelms, mostly for digital-signal processor (DSP) based systems. DSPs are frequently automatic in assembly language by computer operator who know the processor building inside out. The key incentive for this practice is performance, even with the disadvantages of assembly software design when linked to high-level programming.

B. ARDUINO SOFTWARE (IDE)

Get the newest version from the download page. We propose you practice the first one that installs straight everything you need to use the Arduino Software (IDE), with the drivers. Through the Zip package you need to install the drivers manually.

Choose the installation directory (we suggest to keep the default one)
VIII. CONCLUSION

The child security wearable device is capable of working as a smart device. It provides parents and child with the alarm buzzer for their child surroundings and also to alert their child and alert parents when the child is moving away from them within the specified distance. If anyone try to remove the device or apply particular force on the device, then also the alarm will be activated to the parents and the child. And, also the message will be sent to nearest police using the data available in the server.

IX. REFERENCES


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