

SMART STICK FOR VISUALLY IMPAIRED PEOPLE

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Keywords

GPS and GSM, APR9600, IR sensor, Buzzer, Vibrating motor.

Introduction

Eyes are organs of the visual system that can detect all the changes around environment. Visually impaired persons have difficulty to interact and feel their environment. They have little contact with surrounding [1]. Physical movement is a challenge for visually impaired persons, because it can become tricky to distinguish where he is, and how to get where he wants to go from one place to another [2]. They usually use their hearing senses for navigation assistance in their daily activities, but if they only use the sense of hearing it will be dangerous for their safety, so it is needed to develop an intelligent and smart stick to assist and alert visually impaired persons from obstacles and give information about their location. This blind stick is designed using a heart pulse sensor and various electronic modules that can be connected to the Android device of the closest relative.

The use of pulse heart sensors will function as sensing the value of the pulse per minute, this aims to determine the condition of a person's body. Basically, when humans are in a panic condition, the heart or pulse will beat more than the normal frequency, there are several things that will happen if someone experiences anxiety, as follows:

1. Psychological symptoms: feelings of anxiety, bad premonitions, fear of their own thoughts, irritability, tension, anxiety, and shock.
2. Disorders of sleep frequency and tense dreams.
3. Impaired concentration and memory
4. Somatic symptoms: pain in muscles and bones, heart palpitations, spasms, shortness of breath, indigestion, urinary disorders, humid cold hands.

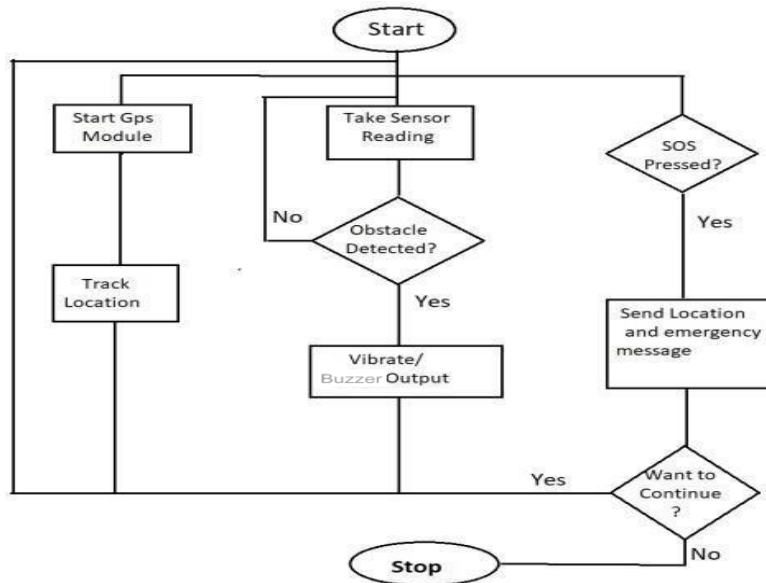
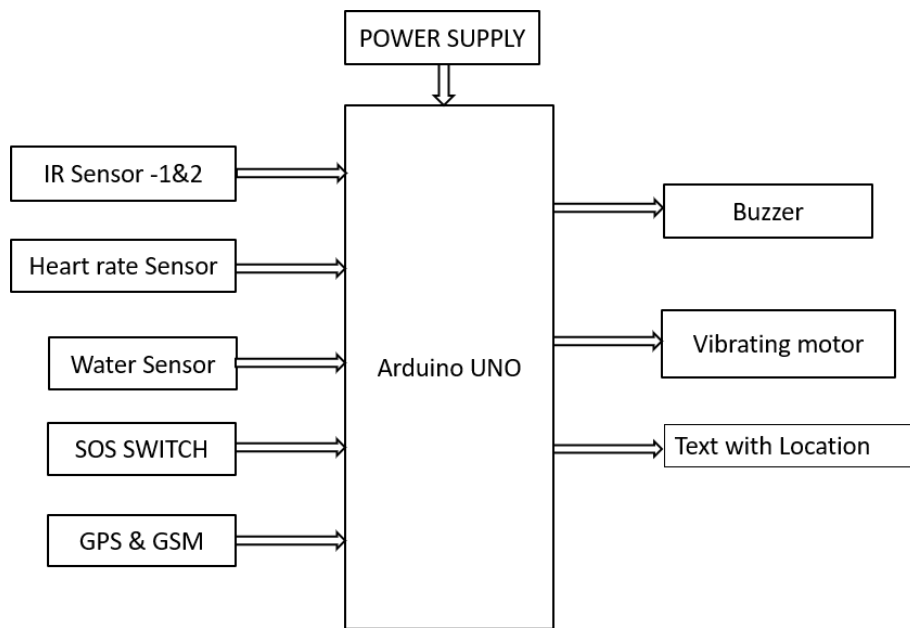
The design of the device resembles as a general white cane. It is divided into 2 types, a long cane and folding cane. Long cane, designed primarily as a mobility tool used to detect objects in the path of a user. Cane length depends upon the height of a user, and traditionally extends from the floor to the user's sternum. It is the most well-known variant, though some organizations favor the use of much longer canes. Folding canes are a convenient way to take the cane anywhere to go. But this stick type is not good, because the conductivity is less sensitive and less strong when used [3]. Sutarsi Suhaeb

[1] was develop a smart cane for blind peoples using IR sensor, ATmega 8535, buzzer, and Vibration DC Motor.

Objective

The main objective is to provide buzzer-based assistance to blind people. In this technology- controlled world, where people strive to live independently, this project proposes an IR sensor stick for blind people to help them gain personal independence. Since this is economical and not bulky, one can make use of it easily.

Methodology



Block diagram and Flow Chart

Results and Conclusion

After several trials of the system on the smart white cane, it can be concluded that:

- (a) The process of detecting objects using IR sensors works well and stable by having two distance conditions, 1-90 cm and 90-140 cm. The maximum distance of object detection on a smart stick reaches 150cm
- (b) The process of connecting the neo6 m GPS module to a satellite requires a considerable time of about 2 minutes, especially if the GPS module is in a confined space.
- (c) SIM800l modules must monitor the voltage used, on this smart stick using an Arduino 5v voltage. less than the specified voltage, the process of capturing GSM signals by SIM800l will be lost signal (no signal).
- (d) Pulse heart sensor is less stable. This is caused by the working principle of the pulse heart sensor using light, in other words the sensor is sensitive to changes in the intensity of the light it receives, so it affects the sensor detection
- (e) The time for sending an SMS is about 6-10 seconds after press the Emergency button.