

# Smart Shoe Based On Internet of Things

**Karthikeyan.M.P**

Assistant Professor, Dept of CSE, S.A.Engineering College, Chennai,India.

**Venkateshwar.S**

Student of B.E, Dept of CSE, S.A.Engineering College, Chennai, India.

**Prasad.R**

Student of B.E, Dept of CSE, S.A.Engineering College, Chennai, India.

---

## ABSTRACT

---

**Blindness, low vision, vision defect and vision loss have dramatic impact on people experiencing such disabilities. Due to this they experience psychological, physiological, social outcomes by impacting the quality of life. This project helps the blind person by providing smart electronic aid kit for people. It aims introducing the Electronic Travelling Aid (ETA) kit to help the visually aided people to find an obstacle free path. This ETA is fixed to the shoe so that they can carry wherever they want. The shoe is connected with the Global positioning system, Ultrasonic sensor and accelerometer sensor. The ultrasonic sensor is used in detecting the obstacle. The GPS is used to find location of the blind person and accelerometer sensor is used for the safety for the person.**

Keywords- **Internet of things, ultrasonicsensor, Global positioning system.**

---

## I. Introduction

The internet of things, could be a system of interconnected computing devices, mechanical and digital machines and objects .It also has the ability to transfer knowledge over network while not requiring human-to-human or human-to-computer interaction. In houses, objects are solely attached to the net. A thermostat can be controlled on app using the smartphone. A kitchen appliance that switches on itself once you've gotten out of bed. An additional example that simply might find yourself is refrigerator that

reminds you to induce milk once you are out. A Dutch has launched associate app that enables you to manage the heating in your home from your workplace. By scanning the RFID chips in merchandise or a garage door that opens once it detects you have got driven onto your street.

This paper is organized as follows: The In section 1:process of smart shoe, In section 2:Evaluation of project depending on their strength and weakness. Finally ,conclusion in section 3.

## II. Process Of Smart Shoe

It is possible to mention two parts as hardware and software. In Hardware part we talk about the building of smart shoe and its requirements .In Software part we talk about the main communication items i.e. android and python which sends signals to each other.

### A. Hardware Parts

#### a) *Requirements:*

1 Raspberry Pi, Ultrasonic sensor, GPS Receiver and antenna, Accelerometer sensor.

#### b) *Raspberry Pi:*

Credit card-card sized computer originally designed for education is known as the raspberry Pi.It is very adaptable for the tinkerers,makers and electronics since it was very small in size as well as in affordable price.It is based on linux which is provided for all computers also very low power consumption.Some of the technical specifications of Raspberry Pi are:

- Memory(RAM),
- Internet connection, Memory(MicroSD),
- Ports(HDMI,4xUSB2.0),
- Ethernet, Camera.

#### c) *Ultrasonic sensor:*

Ultrasonic sensor consists of one transmitter and receiver.40 KHz of ultrasonic can be delivered by the transmitter while maximum receiver is designed to accept only to accept 40KHz sound waves.The next to the transmitter is the receiver ultrasonic sensor will be able to receive 40KHz of sound whenever it faces an obstacle in front.When the ultrasonic module is faced by an obstacle it calculates the time for sending the signals and to receive them since time and distance are related to each other. Upon Receiving the signal, it is connected with the buzzer medium to help the person without interference with the object. Thus many collision that are made by the person can be avoided.

#### d) *GPA Receiver and antenna:*

Atleast there are 4 GPS satellites in the line of sight to the receiver of earth.These GPS satellites send information based on the current position and time to the receivers at regular intervals of time.The collected information are then transmitted to the receiver in the form of signals which are then gathered by the receiver devices.This signals can travel with the speed of light same as the radio waves. The distance between a GPS receiver and the satellite is calculated by finding the difference between the time the signal was send from GPS satellite and the time the GPS receiver received the signal. When the person finds that a blind person is lost, it tracks the current position of the person by the user .It also point the exact

latitude and longitude of the person's position. This tracking can be done on users mobile with the help of the satellites.

**e) Accelerometer sensor:**

The accelerometer sensor were not only used to measure the distance but also for the angle measurement. This sensor can be fixed with the shoe to detect the angle of the person to provide safety of the blinds and sends the feedback to the user by alerting. This reading is calculated with the help of x and y axis of the sensor using the shoe angle.

**B. Software Parts**

**a) Common Gateway Interface(CGI):**

It is a standard way for a web server to pass a web user's request to an application program and to receive data back to forward to the user here the CGI script is used to control the robot by Raspberry Pi through IP address connected to the android device.

**b) Python Script:**

We used the python script to connect ultrasonic sensor, accelerometer sensor to the Raspberry Pi. The ultrasonic sensor also uses commands in python script to detect obstacles.

**c) PHP(Hyper Text Preprocessor):**

It is server-side scripting language for web development. Here in this project the web page of the IP address of smart shoe kit is designed by the user .In the webpage it shows the data of GPS latitude and longitude position and also ultrasonic readings from shoe.

**C. EVALUATION**

The user should know how to use Raspberry Pi, launch an application .This smart shoe can be used for blind people.In this project.The GPS location can be viewed with the exact latitude and longitude positionHere the WIFI technology is used that is supported by smart phones and Raspberry Pi.And the Ethernet connection is also used for coding of the smart shoe.From the weakness side,the connection should not be more than 10m- 15m ,else the connection may weaken and break.

**III. Conclusion**

Earlier there was a problem of less information conveyed, poor efficiency of IR sensor and dependence of stick are overcome and successfully implemented with the efficiency of object detection with the clear information to a blind people. Hence it plays a great role in contribution for the blind people.

**Reference Papers**

- [1] Shinohara,K,“Designing assistive technology for blind users” ACM, 293–294, 2006
- [2] A laser cane for thr blind”Benjamin J.M,Ali N.A.Schepis,In San Diego Biomedical Symposium,Vol-12.
- [3] Johann B., Iwan U., “The Guide Cane for blind”,Proceedings of IEE on Robots.
- [4] Shantanu Gangwar , “Smart stick for Blind”, New Delhi, Sept. 26.

- [5] Selene chew, “The Smart White Cane for Blind” National University of Singapore (NUS), 2012.