

## **SYNOPSIS**

### **TITLE OF THE PROJECT: DEVELOPMENT OF SMART EYEGASSES FOR VISUALLY IMPAIRED PEOPLE**

Reference Number provided by KSCST: 46S\_BE\_5151

Visually impaired people face a lot of difficulties in their daily life. Many a times they rely on others for help. Several technologies for assistance for visually impaired people have been developed. Among the various technologies being utilized to assist the blind, Computer Vision based solutions are emerging as one of the most promising options due to their affordability and accessibility. This project proposes a system for visually impaired people. The proposed system aims to create a wearable visual aid for visually impaired people in which object or person is identified and compared with stored data in the RAM memory and converted into voice message. The voice message is heard on Bluetooth earphones or wired earphones. This will help the visually impaired person to manage day-to-day activities and to navigate through his/her surroundings. Raspberry Pi is used to implement artificial vision using python language on the Open CV platform. First the program was written in Jupyter notebook software and keep testing on it. Once the code get successfully worked then the device is built using raspberry pi, Pi camera, Ultrasonic sensor. The code and its modules were stored in memory card and it plugged in raspberry pi. The raspberry pi run on battery power. If any object or obstacle comes across in front of the Pi camera, the camera records that and sent to raspberry pi. The raspberry pi take that input and run through the code and identify the obstacles and give a voice output through Bluetooth or via earphone.

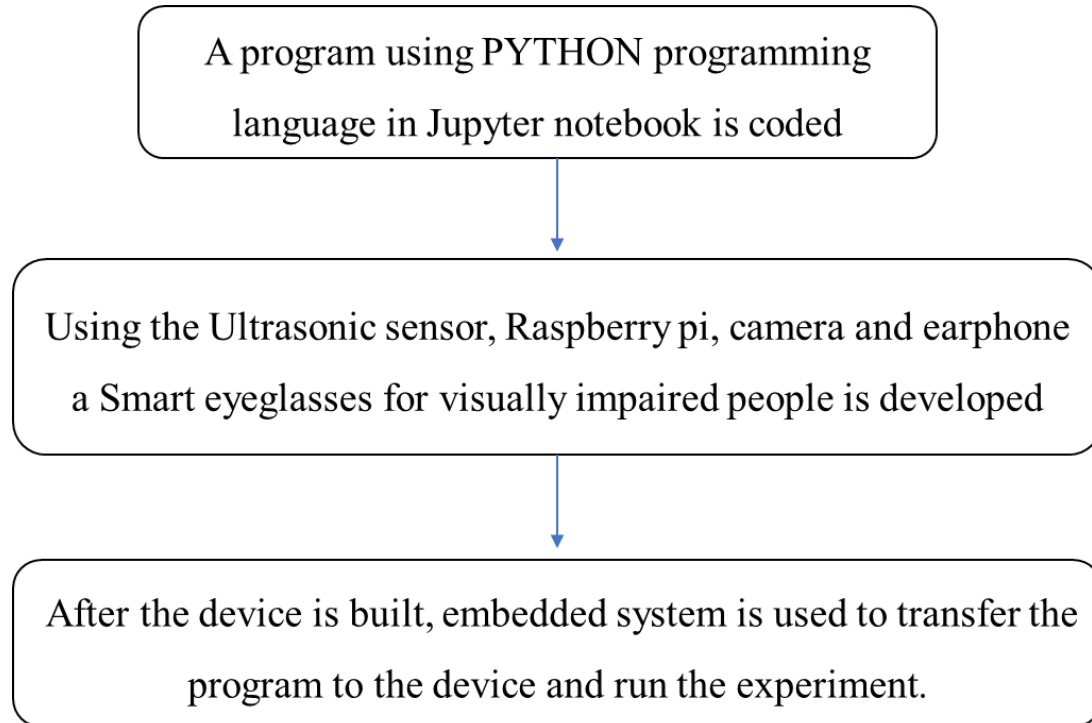
### **PROJECT OBJECTIVES:**

**The main objectives of the project work are as follows:**

- To develop a Smart eyeglasses for visually impaired people which works as an assistant in detecting and communicating about the objects or person placed in front of them over earphone
- To write a program based on Python language on to the device which consists of Raspberry pi, camera, ultrasonic sensor and earphone.
- To check its functionality and working of the device using a computer or laptop

- To calculate the distance between the device worn visually impaired person and the object present in-front and give a voice note with exact data.

### **METHODOLOGY:**

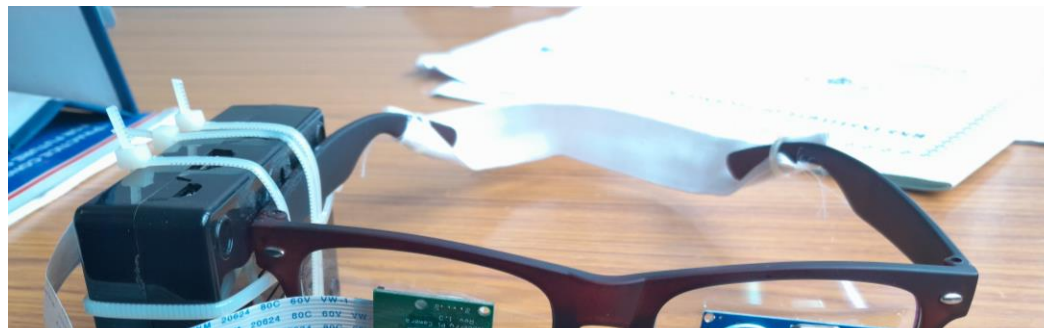


### **EXPERIMENT:**

- The system uses a computer input command as the user interface
- Video is captured by the Pi camera, from which frames are extracted.
- Image processing algorithms for object detection are applied on the frames and the object is detected.
- After the object is located, audio messages from headsets are given to the user to notify him/her about the location and identification of the object.
- Obstacle distance is measured using ultrasonic sensors. Any obstacle encountered in the path is notified to the blind person by telling over earphone.

### **FINAL PRODUCT:**

#### **SMART EYEGLASSES**



**RESULT:**

- It not only helps them avoid any obstacle but also help them in visualizing their nearby environment.
- The proposed system focuses on the identification of the objects.
- The system has been designed in such a way that it can be worn around in the body and can be carried easily.
- The Pi camera which is attached to the Raspberry pi port (CSI) records the scene of the surrounding which is thereby converted into data frames using the dedicated processor.
- Thus on receiving the voice commands, the system immediately generates an output in the form of an audio in order to help the user in navigation.
- The problem of visually impaired people is solved by making a portable, affordable, accessible system