

# SMART GLASSES TO ASSIST THE BLIND

*Project Reference No.:45S\_BE\_4443*

**College** : *The National Institute of Engineering, Mysore*  
**Branch** : *Department of Information Science and Engineering*  
**Guide(s)** : *Mr. Rampur Srinath and Mr. Suhas Bharadwaj*  
**Student(S)** : *Mr. Shashidhar R Bhat*  
*Mr. Abhinav G M*  
*Mr. Chandrachood Bharadwaj P*  
*Mr. U G Gopala Krishna*

## **Keywords:**

IOT, Deep learning model, Yolo V5 , Raspberry Pi 4, External webcam

## **Introduction**

Recently, researches are being actively carried out to improve the life quality of disabled person by using artificial intelligence. Conventional assistive canes have a low detection rate for obstacles and limited detection area. The Smart Glasses are designed to help the blind people understand the surroundings/ their path. The glasses will analyze the path and explain the person about the obstacles in their path via audio feedback. These glasses will act like an assistant, which will constantly tell the person about the things near them if they are classified as an obstacle.

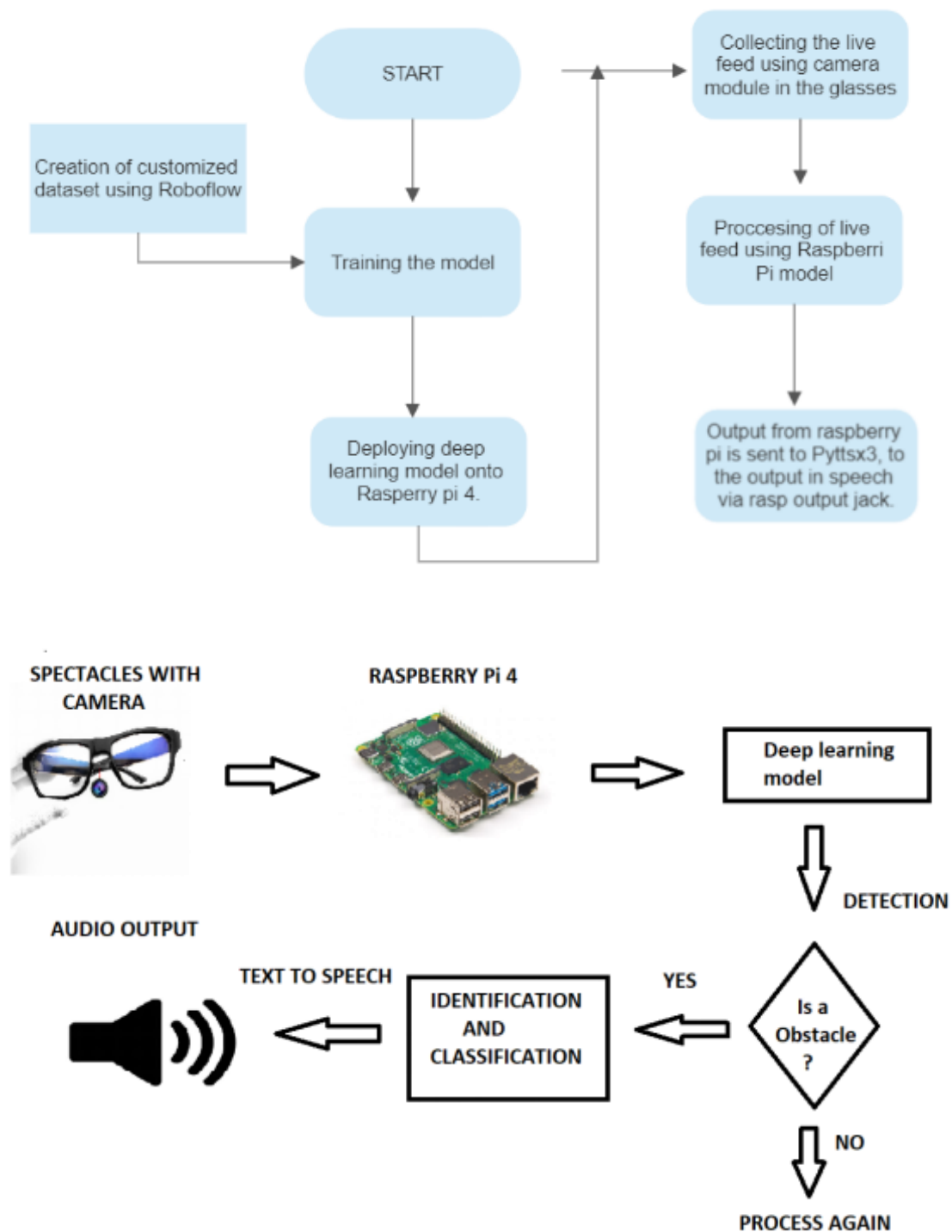
This application helps in predicting the obstacles, PYTorch model is deployed in raspberry pi 4. Now the Raspberry pi 4 will process the video which is fed from the camera and pytsx3 offline API is going to be called if at all an obstacle is detected in the video and predicted text which is given as an output from the model is going to be fed to pytsx3 where Text to Speech conversion takes place, and audio output is given through headphone which will be in the form speech which would help the blind people, to identify the obstacles ahead of them in their path, and take appropriate decision either to move ahead or take diversion or stay still.

## **Objective**

To model a device that assists the visually impaired while walking using object detection. The project focuses to assist the blind people with having improved technology to assist them to classify the objects in front of their path and identify the obstacles ahead of them in their path. The concept of deep learning to classify the object without a doubt is a revolutionary concept. A smart glass with an attached camera module to record the surroundings of the person and using those recordings to identify obstacles in his path. The deep learning algorithms are used to classify the objects as obstacles using OpenCV with Yolo. The identified obstacles are converted to text and speech and is conveyed to the person via an audio device.

## Methodology

In this system we use external camera to get live video feed of the obstacles in his/her path. These feeds will be sent to “Raspberry pi4” which consist of deep learning models, for further classification and identification of the objects. Using Raspberry pi4 we will classify and identify those feeds through deep learning model to identify obstacles in his/her way. Further it will convert those identified obstacles into audio output and send it to the audio device. Here the system design consists of A. Hardware Design, B. Software Design. This type of design helps the blind person to identify the obstacle ahead of his path and take necessary action, whether to move ahead or take diversion or not move at all.



## **Result and Conclusion**

Our Prototype ensures that it should detect the object and classify whether the detected object is obstacle or not and convert the text to speech and send the audio output via earphones to the blind person. In this system we use external camera to get live video feed of the obstacles in his/her path. These feeds will be sent to "Raspberry pi4" which consist of deep learning models, for further classification and identification of the objects. In model in raspberry pi, we will classify and identify those feeds through deep learning models to identify obstacles in his/her way. Further we will convert those identified obstacles into audio by using Pyttsx3 API and send the converted speech to the audio device. This prototype helps blind people to take on spot decision by listening to the audio feedback.

## **Future Scope**

FPS acceleration has to be done, to reduce latency. Adding different categories of objects for detection