Embedded system

Final Report

Mini project

A Friend In Sight

Group – 05

Group Members

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Description

1.1 Project Title

The friend in sight.

1.2 Project Description

Our project is a small robot like system which is going to help the blind or visually impaired people.

1.3 Project Background

In human body the most important organ is eyes because eyes are the main sensors that help us to feel the environment. If some one don't have that future it must be the more cruel thing of nature. They cannot live their own life as like as other people but we should accept they also human beings and they also have feelings. Blind peoples faces so many struggles in their life because of their inability. We can also see some blind peoples struggling to cross the road struggling to be in traffic situation and while buying things in markets. Some heartless peoples also cheat on them with money using their inability. In some countries this kind of peoples using guide dogs for their daily life routines, but their also some problems in fact dogs are red and green blinded and also they cannot read things check prices and other things. These are the main reasons for we have planned to create this system

1.4 Problem and Solutions

This system which we are trying to create is going to help the people who are blind or visually impaired. The main problem of the person who is a blind one is walking through the road. We have created a machine learning program to find out the lane and instruct the user like turn left turn right go straight. We have used open CV for this purpose. We don't implement this with raspberry pi, but we have create a simulation in proteus to take capture using pi camera, and already we have created a

machine learning program to find the way that user need to travel, so we can connect both and get our result what we expected.

Now a days blind people are using white cane and guide dogs for walking through the road. The main problem of this method is dogs are red and green blinded so they can't see the road signal lights, so we can't train the dogs for the signal system, here we have created a machine learning program using python yolov5 to detect the objects, in this case we have only trained that algorithm for cars and persons, we can also trained other objects also using this algorithm but we need to collect a lot of data to create a dataset. only this we can solve so many problems like obstacle avoiding steps finding signals and sign board finding animal identification and etc. almost it can be work as an eye. Now we have implement obstacle avoiding using Arduino ultra-sonic sensor, but It's not efficient as we expect because It cannot find which is in front of user.

The blind people cannot see the world like us, but they also have feelings and emotions like others. This system should be able to navigate the users according their needs, for an example if the user wants to sit and relax the robot should navigate him to the chair, if he needs to drink some cool drinks navigate him to the fridge. This system is not only going to be a navigator but also it should be help in other works. Like reading the letters which is appearing in front of him, like bus schedules train schedules and some magazines also. For this purpose also we can use open cv yolov5 object detecting but we need to do some works in backend, that means we need to use neural network for understanding what we need, like if user asks I need a cool drinks, It should understand, ok I need to find a fridge, If user asks I am tierd, bot should understand I need to find a chair. This thing will be add in future.

When the user tries to buy something in market system should ensure the product's expiry date and price by reading the bar code on the product label. We don't implement the bar code reading system but it will be developed as our future scope.

Also, the user cannot understand the weather conditions and without eyes he can't understand day and night time differs so the system should be able to give weather alerts (like if the weather is likely to rainy give alert to bring an umbrella) and also date time information. For this situation we have implement a system using Arduino and rain sensor to warning the user about raining.

1.5 Methodology

We have used proteus 8 to develop some simulations
We have use python open cv library, pytorch and yolov5 for doing some machine learning parts.

Software requirements

Python 3
Open CV Library
Pytorch Library
Yolov5
Proteus 8
Roboflow
Arduino IDE

Thank You