SGH Synopsis Submission

SMART GOGGLES

PROBLEM STATEMENT

To develop a product which can be helpful to the blind people as they can predict the distance of the object that they can come to contact, not only predict but also our product will suggest the route and the medium of transport to reach to the destination which will be control by our voice command.

SYNOPSIS ABSTRACT

We are trying to create a device that helps blind people detect objects and hurdles in the path and gives a brief about the surrounding environment. Also, it helps find and set a path from point A to B and has features like handwriting detection, text to speech.

LITERATURE REVIEW/EXISTING INNOVATION-TECHNOLOGY TO ADDRESS RELATED TO YOUR PROBLEM

There exists an app "Be My Eye" that connects visually impaired to normal people by using video calls so normal people can talk to them and also helps them.

We are trying to automate that process using Machine Learning.

There is another app known as Envision AI that reads all kinds of text and also describes surrounding objects but It is not useful while a person is traveling.

So we decided to make smart goggles that help visually impaired to navigate from one place to another and also, helps them to read the handwritten text as well as normal text.

WHAT WOULD BE YOUR APPROACH TO SOLVE THE PROBLEM

We are going to create a smart goggle that has an ultrasonic sensor, camera module, vibrator motor.

By using ultrasonic we can detect obstacles and using a camera module can click a picture and send that picture to a server whereby using ML we can compare that image to the existing data set and send back a description about that image to our google as an audio output.

We are also going to create an android app that connects with smart google where you can control your smart goggle setting as you can manage sensor-related settings and add you can add a destination and smart goggles will navigate to that destination using vibrator motor and audio.

TOOLS AND TECHNOLOGIES TO BE USED TO SOLVE THE PROBLEM

Hardware: Ultrasonic Sensor, Vibrator Motor, Node MCU, Arduino Uno,

Wired/Wireless Headset, Breadboard, External Camera Modules

Frontend: Android, Volly, Arduino Talkie

Backend: Node, Express, Docker, Python, Web Sockets, Tensorflow, Google Android of ThingsServer: AWS(Cloud Computing), AWS Rekognition.

We are integrating cloud computing to support and power the machine learning / artificial intelligence of our device. We are utilizing docker to connect multiple backend technologies and containerize the environment.

CHALLENGES/RISK IN IMPLEMENTING YOUR FINAL PROTOTYPE

Trying to make the device and connection to the server uncompromisingly live and real-time with micro-service architecture. Increasing ease of access and making it friendly for the visually impaired. Making the design simple, sleek and minimalistic in the hardware device

Making the applications completely voice interactive so the visually impaired can easily use our product, also we have to give a talkback feature to when any operation is performed.

Apart from this, we have to collect, store, prepare, analyze and classify a large dataset with a wide range of categories for image processing.

POSSIBLE OUTCOME OF YOUR WORK

A hardware device that will allow sightless people to easily and conveniently wander around without the fear of getting hit by something on their path. Also giving them an idea about their surroundings and the environment. Providing them with the accessibility of recognizing the objects, people, their gender, texts and signs surrounding them. It also helps them read and scan QR and detect vehicles, objects and giving the information of what they are. It helps the visually impaired to self improve whilst learning more about the environment around them. It also helps them detect colors and other basic things explicitly.

WORK DONE TILL DATE

Sorted through some basic research work for all the technologies to be used aggregated a diligent plan and a roadmap to a walkthrough. Created a basic layout for the android application and worked out the external sources and integrations from cloud computing technologies.

Hardware prototype works fine in detecting any objects using ultrasonic sensors and responds with vibrating coin motors. The server architecture plan is ready with microservices and web-hooks integrations plan. Created a workflow to work with and sorted out all the necessary needs.

Apart from this, we have to collect, store, prepare, analyze and classify a large dataset with a wide range of categories for image processing.