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Eyes for the Blind-Aira

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Abstract - *The World Health Organization (WHO) reported that there are 285 million visually-impaired people worldwide. Among these individuals, there are 45 million who are totally blind. There have been several systems designed to support visually-impaired people and to improve the quality of their lives. Unfortunately, most of these systems are limited in their capabilities. Aira connects people who are blind or low vision to a trained professional agent at the touch of a button. It provides instant access to visual information for anyone, anytime and anywhere. Using Aira is very simple.*

Key Words: Google Maps, Ultrasonic Sensor, Android, Horizon Kit, ETA, GPS.

1. INTRODUCTION

God gifted sense to human being which is an important aspect in our life. We are able to see the beauty of nature, things which happen in day-to-day life with the help of our eyes. But there are some people who lack this ability of visualizing these things. They face many difficulties to move on with their daily life. For these people everyday tasks such as sorting through the mail or doing some other tasks is a challenge. But what if they could borrow the eyes of someone else who could see? That is the thinking behind Aira. There is a subscription service that is nothing but you have to subscribe it and later it enables its thousands of users to stream live video of their surroundings to an on demand agent, using either a smart phone or Aira's proprietary glasses.

The agents who are available 24/7, can than answer questions, describe objects or guide users through a location. When the agent picks up, he or she sees a live video feed and the location of the person calling on Google Maps, alongside general biographical information. Agents are the voice of Aira to the users, but they are not alone there is whole company behind them to explore and experience the world every day.

Fig -1: Aira Model

2. LITERATURE SURVEY

2.1 Smart Guiding Glasses for Visually Impaired People in Indoor Environment

To overcome the travelling difficulty for the visually impaired group, this paper presents a novel ETA (Electronic Travel Aids)-smart guiding device in the shape of a pair of eyeglasses for giving these people guidance efficiently and safely. Different from existing works, a novel multi-sensor fusion based obstacle avoiding algorithm is proposed, which utilizes both the depth sensor and ultrasonic sensor to solve the problems of detecting small obstacles, and transparent obstacles, e.g. the French door. For totally blind people, three kinds of auditory cues were developed to inform the direction where they can go ahead. Whereas for weak sighted people, visual enhancement which leverages the AR (Augment Reality) technique and integrates the traversable direction is adopted. The prototype consisting of a pair of display glasses and several low-cost sensors is developed, and its efficiency and accuracy were tested by a number of users. The experimental results show that the smart guiding glasses can effectively improve the user's travelling experience in complicated indoor environment. Thus it serves as a consumer device for helping the visually impaired people to travel safely.

2.2 Blind Assistant Navigation System

This paper presents the architecture as well as the implementation of a system that helps blind person navigate independently within an enclosed environment such as the home. The system uses a wireless mesh network to provide the first level localization. It also incorporates additional components to provide more refined location and orientation information. Optimal path planning is done by a server that communicates wirelessly with the portable mobile unit that can be pushed by the blind person. The blind person issues commands and receives direction responses using audio signals.

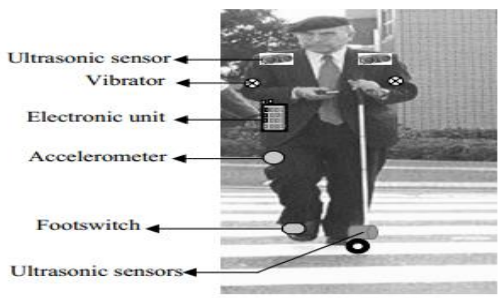

Fig -2: Blind Assistant Navigation System

2.3 Ultrasonic Stick for Blind

Currently the most widespread and used mean by the visually impaired people are the white stick, however it has limitations. With the latest technology, it is possible to extend the support give to people with visual impairment during their mobility; this paper proposes an economical ultrasonic stick for visually challenged people, so as to gain a personal independence and free from the external help. A portable user friendly device is developed that can identify the obstacles in the path using ultrasonic sensors and Camera. Ultrasonic sensors can scan three different directions (at 180 degree). Camera can be used as an alternative tool in the places that surrounds with the low signal coverage, a microcontroller, buzzer and vibrating motor. The buzzer and vibration motor is activated when any obstacle is detected. GPS system provides the information regarding to his current location. SMS system is used by the blind to send SMS message to the saved numbers in the microcontroller in case of emergency.

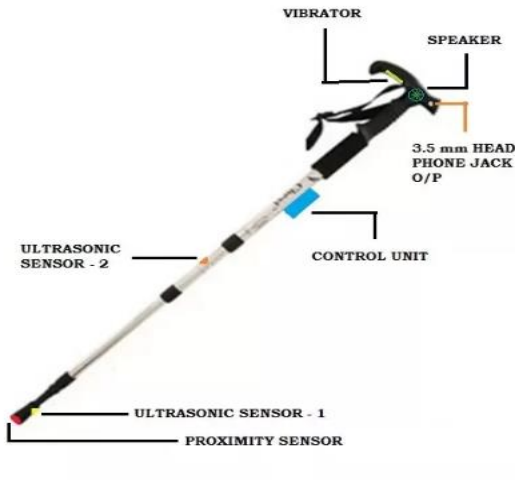

Fig -3: Ultrasonic Stick for Blind

3. PROPOSED WORK

3.1 Android Application

Aira is a service provided for blind and low vision people to connect to the highly trained, remotely located agent. At a touch of a button it provides the service of accessing the information instantly, enhancing the efficiency and independence. Here we can create a free account and use the services without commitments. It will connect to a professional trained agent by less than 10 seconds. Here the visitors can also signup by putting their email id and phone number.

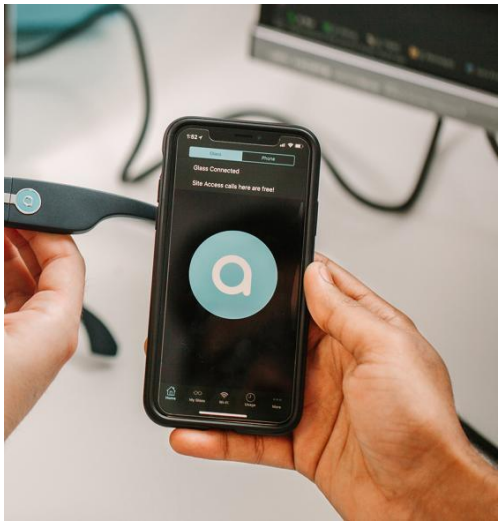

Fig -4 Android Application

3.2 Smart Glass

This smart glass will have a camera in it so that the company agents could see it live. Here the human assistant is put into a blind users ear. By getting live streaming footage from the glasses camera the company agent will give audio instructions to the end users. They present them with directions or describe scenes for them.

Fig -5. Smart Glass

Advantages:

- Completely hands free assistance on the touch of a button.
- The service connects you by phone to an agent who can see whatever your smartglasses camera can see.
- The video feed is crisp enough that the Aira agent can read items off of a menu and catch other small details.

4. IMPLEMENTATION

4.1 Android Application:-

Working:

Step 1: Subscribe and download that is you can sign up in a couple of minutes by downloading the aira app to your smart phone. You can sign up using the email and password or the phone number.

Fig -6 Step1

Step 2: Now the user can connect with the well trained agent and learn how everything works on his first call.

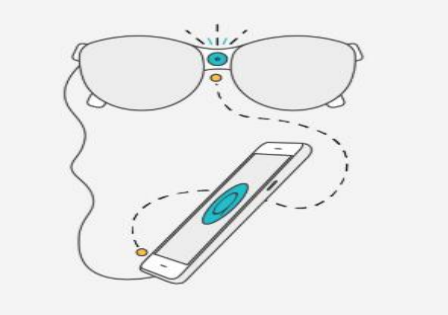

Fig -7 Step 2

Step 3: Now at the touch of the button get the real time assistance that is you can connect to one of the aira agent and get the instant information that is going on and get the assistance easily.

Fig -8 Step 3

4.2 Smart Glass:-

The horizon smart glasses are the ideal piece of hardware for connecting with aira agent. Each Horizon Kit comes with a pair of Horizon Smart Glasses, a Horizon Phone, as well as charging equipment and necessary cables. These glasses are specially designed for visual assistance. The glasses integrate a 120-degree wide-angle camera so guides can gain a fuller picture of a user's surroundings and won't have to instruct them to point their head in a different direction quite as much.

5. CONCLUSION

Aira does not replace existing assistance system. Instead it is developed to enhance them. Aira is a service that connects blind and low vision people to highly trained remotely located agents. From the movement you have setup your Aira account you can explore the world with enhanced efficiency and confidence. Daily tasks are easy when you have a vision in your pocket. You can talk with the specially trained professionals when you connect with the service anywhere and anytime. Agents may be the voice of Aira to the users. They can help you go to the airport, calling an uber they can even help you during the grocery shopping etc. The working with the app is also very easy as one touch and you will be connected to one of the Agent.

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