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A City Information App for Visually Impaired People

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ABSTRACT

For those who are blind or visually impaired, obstacle detection and warning systems can increase both their safety and mobility, especially in strange places. Initially, impediments are identified and located, and then, visually impaired individuals are notified about the barriers through several modalities, including audio. We offer an assistive system for visually impaired individuals in this project, which is built on the models of Google Speech and TensorFlow object detection.

Keywords - Mobile application, Android.

I. INTRODUCTION

People with visual impairments may find it more difficult to carry out daily duties, which can have an impact on their quality of life and capacity to interact with others. The most severe type of vision impairment, blindness, can make it more difficult for a person to move around independently and conduct daily duties. People with various degrees of visual impairment can completely benefit from life, accomplish their goals, and participate actively and productively in modern society with the help of high-quality rehabilitation. A lot of work has gone into developing and advancing technology to help the blind. The primary considerations while tracking an individual are privacy, accuracy, and accessibility, according to "The emerging ethics of human centric GPS tracking and monitoring".

The availability of services for the blind has significantly expanded since the release of a basic sensor. The creation of assistive technology for the blind has attracted the attention of numerous academic institutions and corporations, such as IBM. Obstacle sensors and smart canes are a couple of the most well-known ones. Smart eyewear and self-driving automobiles are examples of recent developments. Over the past three decades, a plethora of further innovations have been created, including smartphone apps and text or speech software. Furthermore, they will benefit greatly from the robots and artificial intelligence systems that are being developed.

The user's compatibility is a key consideration in the development of these technological tools. It should not

be too difficult for him to become familiar with the product. The product's features shouldn't be very challenging to utilize. Even the alerting systems for the blind need to be dependable and cozy. The price of these products is another important consideration. The cost of the product should be within a reasonable level, since they are already covering the cost of therapies and additional nursing care. The durability of these things should be another aspect. It's possible that users won't be able to charge the device. Therefore, the necessary action should be done.

II. LITERATURE SURVEY

Development of an intelligent guide-stick : J.K. Sung, Y.H. Kim and H.K. In (IEEE Transaction 2017) A visually impaired person's guide stick with intelligence was created. A micro-controller, two DC motors and an ultrasonic displacement sensor makeup this system.

Positioning by tree detection sensor and dead reckoning for outdoor navigation of a mobile robot : S. Maeyama, A. Ohva and S. Yuta (IEEE transaction 2015) Using a combination of sonar and vision, the tree detection sensor and dead reckoning, it suggests a positioning strategy for a mobile robot's outside navigation. The mobile robot is thought to be working outside on a roadway surrounded by trees.

In the paper authored by J. Rudan and Z. Tuza in 2010, they detail the creation of a map using a scan matching method specifically designed for indoor metric mapping. The study involves the utilization and assessment of the newly introduced LMS-100 laser rangefinder for both point measurement and metric map construction. To facilitate integration into the applied software framework, the official driver of the rangefinder was adapted to function on the Linux operating system.

Addressing impaired vision as a significant challenge, individuals often rely on human assistance for various daily tasks. This study outlines the development of an intelligent assistive device utilizing multiple sensors specifically designed to aid blind individuals in urban navigation tasks.

The creation of an intelligent guide stick for the visually impaired is discussed in a 2001 paper by J.K. Sung, Y.H. Kim, and H.K. In. Actual experiments were conducted to compare the results with those obtained through computer simulation. The smart guide stick demonstrated successful navigation by effectively avoiding obstacles and adhering to the path of the road. This practical mode of transportation is envisioned to be beneficial for the visually impaired in their journeys.

III.METHODOLOGY

Existing Methods and Drawbacks:

Individuals with visual impairments often rely on assistance from others to navigate their daily lives. The presence of obstacles such as walls, vehicles, trees, and furniture poses challenges for them while walking or crossing roads. These impediments can be hazardous for people with visual impairments, necessitating the support of others in various situations.

Disadvantages:

- Makes dependent
- Harmful
- Time Consuming

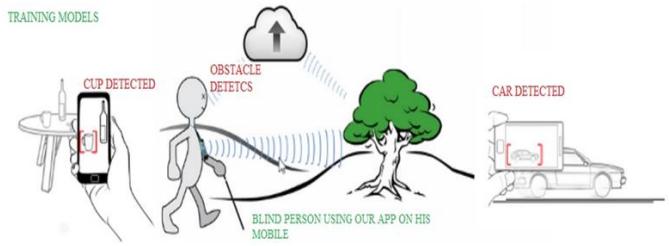
Proposed Method:

For visually impaired people, we have created an Android application that provides navigation and obstacle detection. It tells the blind person which direction objects are located in and can identify obstacles in their path, enabling them to turn in the correct direction and recognize what they are approaching.

Advantages:

- Makes Independent
- It is an environmentally friendly and safe application.
- Helps them accomplish everyday activities and saves time.

Architecture:



Objective:

The objective of this project is to enhance the mobility and safety of visually impaired individuals, particularly in unfamiliar surroundings, through the implementation of obstacle detection and warning. By utilizing TensorFlow object detection and Speech models, the system acquires and analyzes environmental information, ultimately representing obstacle data in the form of speech for visually impaired users.

Modules:

User: User will use this application for Obstacle detection with audio feedback. It will navigate with audio feedback based on input it will redirect to Google Maps.

1. Obstacle Detection: It detects the obstacles and objects if encountered in contact of the blind person with the help of ultrasonic sensor (it measures the distance to an object using ultrasonic sound waves).
2. GPS Navigation: The process of traveling from one location to another is known as navigation. This was the primary goal for GPS development.

IV. CONCLUSION

Application concludes by empowering users to navigate their journey with ease. With our advanced obstacle detection system, users can effortlessly identify obstacles in their path and proactively avoid them, eliminating the need for assistance from others.

V. REFERENCES

[1]. An ongoing effort for a navigational assistance for those with severe visual impairments was presented in the IEEE Eng. Med Biol. Soc. International Conference, Cancun, Mexico, September 17–21, 2003.

[2]. S. Maeyama, A. Ohya, and S. Yuta, "Positioning by tree detection sensor and dead reckoning for outdoor navigation of a mobile robot" in IEEE Int. Conf. Multisensory Fusion and Integration for Intelligent Systems 94, pp. 653-660, 1994.

[3]. B. Ando, "A smart multisensory approach to assist blind people in specific urban navigation tasks" IEEE Transactions Neural Systems and Rehabilitation Engineering, vol. 16, no. 6, pp. 592-594, Dec. 2008.

[4]. J.K. Sung, Y.H. Kim, and H.K. In, "Development of an intelligent guide-stick for the blind" in IEEE Proc. Int. Conf. Robotics and Automation, vol. 4, pp. 3208-3213, 2001.

[5]. J. Rudan and Z. Tuza. Using LMS-100 laser rangefinder for indoor metric map building. In Proceedings of 2010 IEEE International Symposium on Industrial Electronics (ISIE2010). IEEE ISIE, 2010.

[6]. M. Alwan, M.B. Wagner, G. Wasson, and P. Sheth. Characterization of infrared range-finder pbs-03jn for 2-d mapping. In Robotics and Automation, 2005. ICRA 2005. Proceedings of the 2005 IEEE International Conference on, pages 3936-3941, April 2005.

[7]. Yoichi Okubo; Cang Ye; Johann Borenstein. Characterization of the hokuyo urg-04lx laser

rangefinder for mobile robot obstacle negotiation. In Unmanned Systems Technology XI. Proceedings of the SPIE, 2009.

[8]. Sierra, Javier S; Togores, Joaquin SR. Designing mobile apps for visually impaired and blind users. The Fifth International Conference on Advances in Computer-Human Interactions, 2012, 47-52.

[9]. Oliveira, Joao; Guerreiro, Tiago; Nicolau, Hugo; Jorge, Joaquim; Goncalves, Daniel. "Braille Type: unleashing braille over touch screen mobile phones". Proceedings of the 13th IFIP TC 13 international conference on Human-computer interaction., 2011.

[10]. Bigham, JP; Cavender, AC; Brudvik, JT; Wobbrock, JO; Ladner, RE. "WebinSitu: A Comparative Analysis of Blind and Sighted Browsing Behaviour", ASSETS'07, Tempe, Arizona, USA, Ocy, 15-17, 2007.

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