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Department of Artificial Intelligence & Data Science

3.3.2 Number of books and chapters in edited volumes/books published and papers published in national/ international conference proceedings per teacher during last five year

Sr. No.	Name of the teacher	Title of the book/chapters published	Title of the paper	Title of the proceedings of the conference	Name of the conference	National / International	Calendar Year of publication	ISBN number of the proceeding	Affiliating Institute at the time of publication	Name of the publisher
1	Ms. Sejal D'mello		Navigation Assistance for the Visually Impaired: An Image Segmentation-based Web Application	INDIACOM-2023	Bharati Vidyapeeth University of technology, New Delhi	International	2022-23	ISSN 0973-7529; ISBN 978-93-80544-48-9	VCET	IEEE Xplore


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Navigation Assistance for the Visually Impaired: An Image Segmentation-based Web Application

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Abstract - The objective of this paper is to create a mobile app that can aid visually impaired people in navigating outdoor surroundings through floor segmentation technique. The app uses phone's camera to capture live video of the user's environment, which will be analyzed to identify and segment the floor area. As a result, the user will be able to obtain audio information regarding their location and distance from nearby objects or obstacles. This proposed system is a practical and low-cost solution that can be effortlessly incorporated into existing smartphone technology, providing an easy-to-use and accessible tool for the visually impaired to navigate through outdoor environments.

Keywords- visual impairment, floor segmentation, audio feedback, low-cost solution, outdoor navigation.

I. INTRODUCTION

The development of technology has opened up new possibilities for individuals with visual impairments to navigate their surroundings more independently. Navigating outdoor environments can be especially challenging for these individuals, who may struggle to identify obstacles and hazards. To address this issue, we propose the development of a web application that utilizes image segmentation technology to assist visually impaired individuals in outdoor navigation. The app will provide users with real-time feedback on their location and surroundings, allowing them to navigate safely and with greater ease. By utilizing floor segmentation, the app will be able to detect changes in floor textures and provide haptic and audio feedback to alert the user of any potential hazards or obstacles in their path. Segmentation divides an image into different parts based upon certain parameter like color, intensity, texture, etc [1]. The app will be designed to be user-friendly, with a simple and intuitive interface, and will be tested and refined based on feedback from visually impaired individuals. This floor segmentation-based app is a more accessible, practical, and efficient alternative for visually impaired people than other existing hardware-based technologies such as electronic travel aids or smart glasses, guide dogs, white canes, etc.

This system has the potential to make a meaningful difference in the lives of individuals with visual impairments by providing them with greater autonomy and independence in their daily lives.

II. RELATED WORK

In [2], for applications involving mobile robots, the research presented a unique approach for floor recognition from a single picture, the grayscale picture using the Canny edge detector. To enhance the preservation of tiny line segments that appear at the bottom border of doors, the Douglas Peucker algorithm was modified as described. The lines that should be taken into consideration were discovered using a threshold and scoring approach, and they are then provided to a linear classifier for prediction. In this article, the model was trained using a dataset of more than 400 interior corridor photos from dozens of different buildings, displaying a wide range of situations. The biggest flaw of the system in [2] is its tendency to become perplexed on highly textured floors, or when a very dark image results from inadequate gain control.

HIDA, a portable assistance system in [3] for thorough indoor detection and avoidance, is based on solid-state LiDAR sensor segmentation from a 3D point cloud. Additionally, to improve the efficiency of the entire system, the authors have developed a point cloud segmentation model with two lightweight decoders for semantic and offset predictions. On the ScanNet v2 dataset, the suggested 3D instance segmentation model demonstrated cutting-edge performance. But in HIDA system, real-time processing is not feasible due to the time-consuming nature of the point cloud segmentation and surrounding environment scanning. Additionally, there is still tremendous room for improvement in the existing point cloud instance segmentation model's accuracy.

In [4], the research suggests ViT as a technology that helps people with vision impairment navigate uncharted territory by using a vision transformer model to identify





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This is to certify that Prof. / Dr. / Mr. / Ms. Sejal D'Mello of Vidyavardhini's college of Engg. & Tech has attended / contributed / presented a paper entitled Navigation Assistance for the visually Impaired: An Image Segmentation based web Application. during INDIACom-2023; 17th INDIACom; 2023 10th International Conference on "Computing for Sustainable Global Development" organised by BVICAM, New Delhi.


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