

A Review on Vision-based Obstacle Avoidance and Assistant Systems for Visually Impaired People

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Abstract. Though the assistant and navigation technologies has been developed rapidly and make our lives easier in the past decade, still there are issues in using them for visually impaired people because almost all the modern digital devices uses vision-based modules like displays as the main interaction module so it is hard to operate by a person who don't have the vision. Even though many new technologies like voice assistants are developing day by day to reduce this disability digital divide it couldn't give satisfactory results for visually impaired people in some tasks like travelling. In the past decade, many attempts have made to address this problem of applying modern technology to the issues that visually impaired peoples face in day today travelling. Different kind of vision technologies and sensor technologies has used in the previously developed systems and in this paper, we are mainly focusing on computer vision-based navigation and assistant systems. Many types of approaches have made by the research using modern technologies like Deep Learning, Machine Learning, and Image Processing Techniques to enhance the Computer Vision modules to make accurate, reliable and portable smart wearables for visually impaired people to make their day today travelling easier. The focus of these systems is to give more efficiency and functionalities than the traditional methods like white stick and guide dogs used by visually impaired people. In this paper we try to compare those systems by understanding their technologies, used modules, algorithms, efficiency, usability, functionalities as well as their pros and cons.

Keywords: *Computer Vision, Deep Learning, Machine Learning, Image Processing, Smart Wearables*