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Empowering Independence through Real Time Object Identification and Navigation for People with Disabilities

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Abstract: *Recent studies in assistive technologies for visually impaired individuals showcase a diverse range of methodologies, algorithms, and implementations aimed at enhancing their independence. A notable focus revolves around leveraging cutting-edge technologies such as YOLO (You Only Look Once), SSD (Single Shot Multibox Detector), and Faster R-CNN (Region-based Convolutional Neural Network) to develop real-time object detection systems and deep learning-based smartphone navigation solutions . One prevalent theme in these advancements is the incorporation of auditory feedback to facilitate enhanced user interaction. This is achieved through sophisticated text-to-speech conversion and the integration of audio cues. The utilization of auditory cues not only aids in real-time awareness of the surroundings but also significantly contributes to the overall user experience . Despite remarkable progress, challenges persist in the realm of assistive technologies for the visually impaired. Issues such as processing speed, the occurrence of false positives and negatives, and the adaptability of these systems to various environmental conditions remain prominent. These challenges underline the need for continued research and development in this field to address existing limitations and refine the effectiveness of these assistive technologies .In essence, this survey provides a comprehensive understanding of the current landscape of assistive technologies for the visually impaired. By identifying both achievements and existing challenges, it serves as a valuable resource for researchers and practitioners, contributing to ongoing advancements that ensure tailored solutions and improved independence for individuals with visual impairments.*

Keywords: Visual Impairment, Assistive Technologies, Object Detection, Smartphone Navigation Deep Learning, Auditory Feedback, Indoor Navigation

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