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Blind Assistance System Using YOLOv8

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Abstract: *For real-time object detection and speech alarms, Research offers a sophisticated blind aid solution that smoothly combines the YOLOv8 algorithm with OpenCV's DNN (Deep Neural Network) module. The main objective is to improve the safety and freedom of people with visual impairments by offering quick object recognition and audio feedback. The YOLOv8 method, which is tuned for real-time inference, is used by the system to precisely recognize objects after using a webcam to record live video input. It further determines the distance and direction of detected objects, counts multiple instances, and provides real-time voice alerts when any object is too close to the user. Then, using audio description, it produces speech notifications that provide crucial details about the things it has spotted. Because of its exceptional versatility, the research can provide speech outputs in the user's preferred language, increasing its usability and accessibility. Its versatility is further demonstrated by its capacity to precisely handle a variety of object classes, making it a priceless tool for greatly enhancing the lives of those who are blind or visually impaired. Challenges in real-time object detection include occlusion, scale variations, and cluttered environments. Researchers must navigate the trade-offs between accuracy and speed. Real-time object detection is pivotal in computer vision, enabling intelligent systems across diverse applications. The continuous evolution of deep learning algorithms and hardware capabilities pushes the boundaries of this field, making it a dynamic research domain in artificial intelligence.*
Additionally, this project incorporates a focus-based detection feature that prioritizes objects directly in the user's path, ensuring more meaningful alerts. These enhancements collectively strengthen the system's effectiveness as a reliable real-time assistive tool.

Keywords: yolov8, Real-time object detection,Speech alerts

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