Mobility Assistive Technology with Artificial Intelligence: Indoor Navigation assistance for the visually impaired using Arduino-based assistive Goggles

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Abstract:

Over 2 billion people around the globe suffer from near or distance vision impairment. Moreover, it continues to rise, leading to an increase in demand for assistive devices. With this, Project MATA (Mobility Assistive Technology with Artificial Intelligence) aims to develop a system capable of object detection to assist visually impaired individuals. The research utilized OpenCV environment in YOLO (You Only Look Once) and COCO.names. Designed, fabricated, and assembled a goggle frame using FDM (Fused Depositing Modeling). Project MATA developed a reliable and accurate assistive device that runs from Linux operating system using 1080p webcam and ultrasonic sensor. Integration of the OpenCV and YOLO with additive manufacturing, a 3D printed goggle frame with a simple and functional design. Project MATA recommends using faster processing and portable hardware for the system.

Keywords:

Additive manufacturing, Assistive device, Object detection, OpenCV, YOLO.