Aiding Visual Impairments: Eliminating Object Detection Disparities Through the Use of a Yolo Algorithm

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Approximately 10% of people in the world are legally blind & 2% of those are totally blind. This can lead to accidents happening in this population's everyday life. Current tools available to those visually impaired while effective to an extent, don't actually give the user the whole picture of their surroundings. The purpose of this project is to mitigate this object awareness disparity. Audio vision, the solution proposed, will use a Yolo algorithm that identifies a user's surroundings as objects, roads, or other everyday items. It's expected for the users to have an easier time traversing through life and our controlled environment, which will be a classroom, with our algorithm. The vision impairment was simulated by blindfolding participants and instructing them to traverse a room with the help of a walking stick, senses-with the exclusion of sight, and our algorithm. The participant's goal was to reach the exit of the room after walking around 3 times in the quickest time possible and without bumping into objects. Data on the effectiveness of each tool/method was collected in tables and graphs. After testing was conducted, the algorithm proved to result in the least amount of time and objects bumped into. For the algorithm trial, the average time was 93 s. and the average number of objects bumped into was 4.5. The initial hypothesis was proven to be correct because the other, more conventional, methods resulted in the participants bumping into more objects and spending more time reaching their destination.

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