

# Employing Computer Vision to Provide Artificial Eyes for the Visually Impaired and Blind

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Over the years, I have worked with the visually impaired and the blind community in aiding them in different necessities of their lives. The visually impaired and the blind are sometimes overlooked when it comes to technology. I want to give the visually impaired the chance to be independent, in all settings. Since the blind community has told me about being hit by cars, I conceived of the idea of applying a current concept available in cars to the visually impaired and blind. For many years auto companies have developed self-driving cars that apply computer vision to help navigate the car, in a way acting as the cars' "artificial eyes." With this I, learned Python and Open CV to design my device. Based on autopilot principles, the device can tell the visually impaired if they are about to walk past the sidewalk's boundaries or if there is an obstacle in front of them. There are two different paths, in which I measured three different variables: total traveling time, obstacles hit, and times stepped out of boundaries, experimenting with the device, the white cane, and the combination of both. Experimental data supporting the device equipped with autopilot functions is more efficient than modern white canes in preventing the visually impaired and blind from falling off the sidewalk or hitting obstacles. It did support my hypothesis that I was able to create a device that can help the visually impaired and blind, but is also compatible with their white cane as well.

## Awards Won:

International Council on Systems Engineering - INCOSE: Certificate of Honorable Mention