How Computer Vision Can See For the Visually Impaired

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The field of Computer Vision offers quite a lot in terms of technological innovation. Giving computers the ability to understand visual information with near-human accuracy opens up the potential for all types of innovative applications. I am personally very interested in the ways AI and Computer Vision can be used to improve the quality of life for people with disabilities. Assistive technology is not a new concept, but we are just beginning to scratch the surface of what AI can do to advance this field.

My research led me to a specific application of Computer Vision in assistive technology that I find particularly impactful, real-time navigation assistance for the visually impaired. Cornel Amarei, CEO and founder of .lumen, an assistive technology for the blind, began his career in the field of autonomous driving. His experience as the only person without a disability in his family inspired him to take what he learned about autonomous driving and apply it to a problem facing a majority of visually impaired people, which is safe and independent mobility. There are over 300 million visually impaired people in the world and few solutions for mobility, the two most common being use of a cane and the assistance of a trained guide dog.

The .lumen glasses are this company’s innovative third solution, a headset that sits on the forehead and is comprised of cameras, sensors, batteries and a haptics system. This combination of cameras and lidar use the same object detection AI used by autonomous vehicles to understand the visually impaired person’s surroundings and then feeds information about obstacles into the haptic system which uses physical sensation to guide the person away from danger, much like a guide dog would. This technology is 10x less expensive than training and obtaining a guide dog and offers an option for those who are unable to afford a guide dog or are otherwise uninterested in having a dog.

This technology has the potential to make the world a more safe and accessible place for hundreds of millions of people, and is already on track to be free or massively subsidized for the people who need it across Europe. Further iterations of this technology promise to be lighter, more compact and more powerful over time as they are currently only constrained by the limits of technology like camera, sensor and battery size.

Citations

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