Specs: A Wearable Smart Device for Dementia Patients

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Worldwide, around 50 million people have dementia, with nearly 60% living in low and middle income countries. Every year, there are nearly 10 million new cases. Our project aimed to develop an intelligent spectacle system which helps reduce anxiety and paranoia in people suffering from dementia when faced with people and surroundings they don't recognize. Our system, Specs (Specialized Personal External Care System), mounts onto the patient's glasses, and employs computer vision and machine learning software to detect and identify faces. Our Specs System has two main configurations: auditory and visual. The visual configuration feeds the information to an OLED display. This data is then projected onto a transparent piece in front of the patient's eye. The auditory configuration instead transmits the information through a bone conductor transducer built into the device. We also created a companion app for the Specs system. The app was developed to make the system as user friendly and intuitive as possible. It possesses many features such as; remote power management, personal profile management, identifiable image uploads and remote message communication between the app and the device. A working prototype was developed and demonstrated to multiple people who had close connections to people with dementia such as care-workers or people diagnosed with dementia. In our surveying of Specs, 100% of people surveyed who work with people with dementia, said that they would recommend Specs. Specs successfully detects and identifies faces, then effectively outputs the information to the patient either visually or audibly. This reduces fear, anxiety and paranoia in the patient when faced with people and surroundings they don't recognize.

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