Smart Device for the Visually Impaired

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Over 300 million people around the world are color blind and at least 2.2 billion have a visual impairment. Which is why this project aims to help the visually impaired so individuals can not only recognize colors but objects easily. Studies have shown that 1 out of 4 individuals who suffer from any type of vision loss are diagnosed with anxiety or depression due to a variety of social and psychological factors. Danaya's brother, Sony, who is color blind found out very quickly that with this impairment he wasn't going to have the same opportunity as others around him. The goal of the Smart Device is to help people like Sony identify colors and objects independently. The Smart Device helps identify colors or objects with voice activation by Alexa. First, the students coded a program on an Arduino UNO board to serve as the project's brain. Second, with a color sensor, the sensor detects light frequencies. After the sensor determines the color, the Liquid Crystal Display (LCD) prints the name of the color. Third, the students attached a Respeaker Pi HAT to a Raspberry Pi 3. The Re-speaker speaks out the color of the object the user wants to be identified through the Raspberry Pi 3, you can ask Alexa to help you identify the color that the sensor is picking up; along with every other feature an Alexa has. The glove will identify color by touch, with voice activation by Alexa. All this is programmed by Arduino, adding the Alexa coding into the color sensor code with adjustments as well. This device will help the user identify the colors of the objects they are using. The students then coded a sensor that detects not just color but objects as well. It can work with the help of AI and OpenCV it can detect objects and be typed out on the LCD.

Awards Won:
Arizona State University: Arizona State University ISEF Scholarship (valued at up to $58,000 each)
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