X-Enhance: A New Technology of Color Enhancement for the Visually Impaired

Laboy-Torres, Angelik

Hernandez-Castro, Sebastian

Color blindness, a medical condition that affects approximately 200 million people globally, is characterized by the impaired ability to distinguish certain colors in the human color spectrum (Anon, 2001). Roughly 8% of men and 0.5% of women are affected, meaning that men are approximately 100 times more likely to be affected than women. In an attempt to correct this visual impairment, several organizations have tried to create devices that help the damaged retinal cells, but they have created more inconveniences than advantages. As a group that has fallen in the shadows and still persistent in growth, the aim is providing a rapid and simple diagnosis system without damaging color perception while also correcting their color deficiency. In order to achieve this goal, a novel device was designed with code colorization and interchangeable filters of specific wavelengths creating image-recoloring. In conjunction with an application for detection, fifteen subjects were tested through hybrid images to confirm their diagnosis and manipulate their filtering setting. After the rigorous testing, the prototype proved to be successful in enhancing the user's color spectrum. By applying the data gathered from this research, it could potentially ease the creation of an enhanced optic device for an everyday eyewear in civilians, including underprivileged communities, as it provides promising results at affordable cost. In addition, doctors could become more interested and help find a permanent cure for this community. Presenting this innovative device could also impact the colorblind community positively to create awareness and provide cost effective means for treatment.

Awards Won: