

ClearSight: Gamified Eye Muscle Exercise System

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The ClearSight project aims to reduce myopia progression through targeted eye exercises that strengthen eye muscles. Myopia, or blurred distance vision, is rising globally due to genetic and lifestyle factors like extended screen use. ClearSight offers a preventive, accessible, and engaging solution using LED-guided exercises to promote eye muscle health. The ClearSight system guides users through gamified exercises, including focus shifting, saccadic training, circular tracking, and Trataka, which promote eye movement. The initial prototype featured a cross-shaped 48-LED matrix mounted on a helmet, which proved unstable and limited movement to a fixed cross pattern. The second prototype addressed these issues by replacing the helmet with a fixed, standalone structure and a single Neopixel LED that moved freely in any direction with a motorized setup, allowing for more dynamic tracking exercises. The updated prototype also used a Raspberry Pi running MediaPipe, an Arduino, and motor drivers to convert motor movements to precise LED locations, enabling eye tracking and real-time data collection. However, this prototype was bulky and difficult to disassemble, keeping this feedback in mind new prototype was developed which was less in weight and easier in assembly. The latest prototype was evaluated again with the same 40 participants over two weeks. Participants found the new prototype more engaging, with similar results: 85% reported decreased eye strain, a 25% improvement in saccadic speed, and a 20% reduction in eye fatigue. ClearSight shows promise as a non-invasive tool for improving eye health.

Awards Won:

