Frameless

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Using Virtual Reality with Integrated Eye Tracking for Visual Rehabilitation

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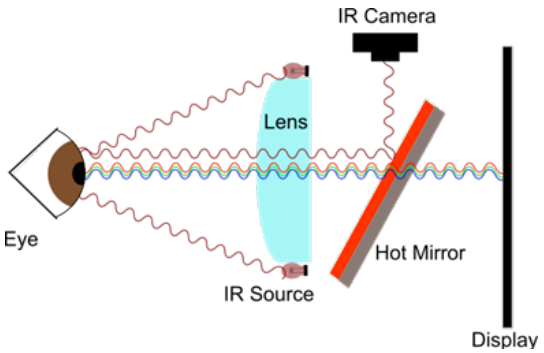
A stroke affecting the visual areas of the brain can often cause substantial blind areas in the visual field, called cortical blindness (CB). These blind spots are not caused by damage to the eye itself, but by damage to the visual processing mechanisms in the brain. Although rehabilitation programs have been developed to help CB patients recover visual function, they are limited in the efficiency of the recovery. The first generation of recovery techniques are performed while seated at a desktop computer with the head immobilized in a chin rest. Eye tracking, which is essential to the successful completion of the training, is only done at the first training session supervised by an expert, and the absence of in-home eye tracking during the remainder of the training leads to many wasted trials. Additionally, the training target is very simple, and does not fully stimulate the regions of the brain that enable the recovery. Our aim is to improve upon previously demonstrated training efficiency by leveraging emerging virtual reality (VR) technology with integrated eye tracking. Our new VR-based system is cost effective, can be deployed at home, and facilitates more natural, head-free behavior. The proposed work is a first step towards the long-term goal of developing a more effective at-home rehabilitation paradigm that provides richer a richer stimulus, is more enjoyable, and can increase training efficiency, thus improving patient recovery of visual function.

Platform: HTC Vive with SMI Eye tracker (used in video): https://www.youtube.com/watch?v=_ZT2kk3XWnA&feature=youtu.be



Prototype PupilLabs eye tracker integration: