3D Gaming Using Eye Movement Position for Vision Therapy

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Technology description

Method and Apparatus for the Treatment of Binocular Dysfunctions
Technology Brief:
Researchers at New Jersey Institute of Technology in the Department of Biomedical Engineering have invented a 3D virtual reality game that using eye movement to train disparity vergence for patients with binocular vision disorder.
Eye movements are needed to bring visual information to the brain. Eye movement disorders are present in about 8-10% of the population and in up to 50% of the brain injury populations. Convergence insufficiency (CI) is a binocular vision disorder and is characterized by reduced near point of convergence, shown in the diagram. Symptoms of CI include diplopia (double vision), blurred vision, asthenopia (eyestrain), and headaches when engaged in reading or other near work that negatively impacts activities in day-to-day living. While current vision therapy works well in patients with CI, it is mundane, boring and expensive. The invention is a virtual reality 3D game that engages a person’s attention using a head mounted display controlled by eye movement. It uses eye position within a 3D virtual reality game to stimulate disparity vergence abruptly and smoothly while keeping accommodative vergence constant. By having the patient use eye tracking to navigate an interactive game, it has potential to improve patient compliance and allow rehabilitation to occur within a home setting.

Application area

- Binocular vision disorder
- Brain injury
- Disparity vergence

Advantages

- Inexpensive
- Interactive
- Improve patient compliance

• Can be used in a home setting
• Accommodative for any head mounted display

Institution

New Jersey Institute of Technology

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