Virtual Reality Rehabilitation for Stroke Victims

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Technology description

Research confirms that following injury the adult brain is capable of remarkable adjustments to take on changes in motor and sensory experience. For the four million Americans living with the effects of stroke, retraining the brain is a promising step towards renewed daily functioning.

The quality of rehabilitation is essential. While traditional approaches focus on physical manipulation of objects like blocks and puzzles, some virtual reality devices have been developed for tracking patient movement and displaying the results on a computer screen. Combining both strategies could support new forms of healing. UW–Madison researchers have developed a low-cost rehabilitation system that provides a virtual reality environment in which a patient’ s depicted hands manipulate simulated structures. Programmed tasks can be designed with increasing difficulty and progress data is reviewable by a therapist.

The Bimanual Rehabilitation Device (BiHRD) uses a depth-sensing camera positioned in a workspace to follow a patient’ s hand and finger positions. According to predefined mapping between real and virtual space, a display represents one or both hands in a simulated environment. This display can be a computer screen or eye goggles worn by the patient. Elemental exercises may include grasping and controlling virtual objects.

Application area

Stroke and neurological rehabilitation

Advantages

Tasks can be broken down into separately practiced and evaluated components.
Challenge levels can be tailored.
Customized practice sustains interest.
Performance is reviewable.
System isolates hand-eye control path to eliminate ambiguous or confusing sensory cues.

Operable at home with low cost

Institution

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