Development of a low-cost upper limb rehabilitation system using BCI, eye-tracking and direct visual feedback

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ABSTRACT

We are developing a novel system to improve arm function in stroke patients who have no, or only residual upper limb movement. Such a system fills an important gap in treatment options for people with little-to-no upper limb movement after stroke, and for whom regular treatments often are unsuitable. The system provides real-time visual and proprioceptive feedback of the arm plus the ability for participants to steer the movement direction of the arm through an assistive movement platform. The patient controls the system by simply looking at stimuli and engaging in motor imagery. The patient gaze is monitored with an eye tracker and motor output intentions are monitored with an EEG-based brain computer interface. Stimuli are presented as games in order to create a motivating rehabilitation environment. In this paper we discuss our motivation and design of the system.

Full papers will be published in the Conference Proceedings and will be freely available to delegates at the conference and online on September 20, 2016.