

## **A Robotic Rehabilitation Arm Driven by Somatosensory Brain-Computer Interface**

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**Abstract :** It was expected to benefit patient with hemiparesis after stroke by extensive arm rehabilitation, to partially regain forearm and hand function. This paper propose a robotic rehabilitation arm in assisting the hemiparetic patient to learn new ways of using and moving their weak arms. In this study, the robotic arm was driven by a somatosensory stimulated brain computer interface (BCI), which is a new modality BCI. The use of somatosensory stimulation is not only an input for BCI, but also a electrical stimulation for treatment of hemiparesis to strengthen the arm and improve its range of motion. A trial of this robotic rehabilitation arm was performed in a stroke patient with pure motor hemiparesis. The initial trial showed a promising result from the patient with great motivation and function improvement. It suggests that robotic rehabilitation arm driven by somatosensory BCI can enhance the rehabilitation performance and progress for hemiparetic patients after stroke.

**Keywords :** robotic rehabilitation arm, brain computer interface (BCI), hemiparesis, stroke, somatosensory stimulation

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