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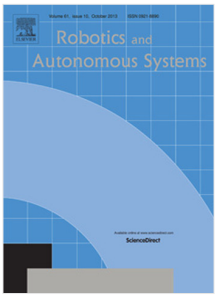

A soft supernumerary robotic finger and mobile arm support for grasping compensation and hemiparetic upper limb rehabilitation

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A soft supernumerary robotic finger and mobile arm support for grasping compensation and hemiparetic upper limb rehabilitation.

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Abstract

In this paper, we present the combination of our soft supernumerary robotic finger i.e. Soft-SixthFinger with a commercially available zero gravity arm support, the SaeboMAS. The overall proposed system can provide the needed assistance during paretic upper limb rehabilitation involving both grasping and arm mobility to solve task-oriented activities. The Soft-SixthFinger is a wearable robotic supernumerary finger designed to be used as an active assistive device by post stroke patients to compensate the paretic hand grasp. The device works jointly with the paretic hand/arm to grasp an object similarly to the two parts of a robotic gripper. The SaeboMAS is a commercially available mobile arm support to neutralize gravity effects on the paretic arm specifically designed to facilitate and challenge the weakened shoulder muscles during functional tasks. The proposed system has been designed to be used during the rehabilitation phase when the arm is potentially able to recover its functionality, but the hand is still not able to perform a grasp due to the lack of an efficient thumb opposition. The overall system also act as a motivation tool for the patients to perform task-oriented

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