

# **NEXT LEVEL INNOVATION IN ROBOTICS AND AUTONOMY**

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**Title:** Assist as required control of a robotic wearable hand exoskeleton for neuro-rehabilitation of stroke patients

**Abstract:**

Patients suffering from loss of hand functions caused by stroke or spinal cord injuries have driven a surge in the development of wearable robotic devices. This talk covers several aspects of the design, assist as required control and experimentation of hand exoskeletons for rehabilitation of stroke patients. The designs are based on the human finger motion trajectory, in order to emulate the motion of the varying instantaneous axis of rotation of the finger joint axes. A Brain Computer Interface that utilizes the wearers EMG and EEG signals actuates the exoskeletons and during neuro rehabilitation therapy an assist as required controller adjusts the difficulty level of the exercise. The exoskeleton can operate on autonomous mode with minimum supervision. Experimental results with stroke patients prove the utility of these devices.