

6th International Conference & Exhibition on

Physiotherapy & Physical Rehabilitation

August 13-14, 2018 | London, UK

EMGB – Communication principle based electro myo graphic bridges for motor function rebuilding of paralyzed limbs

Zhi-Gong Wang^{1,2} and Xiao-Ying Lü^{1,2}¹Southeast University, China²Nantong University, China

In the world there are more than 100 million limb paralyzed patients caused by stroke, cerebral palsy, spinal cord injury (SCI) and other diseases. Since the foci of those patients are located in the central nervous system (CNS) and the neurons in CNS are difficult to regenerate by means of medicines and biomedical methods, we have conceptualized the techniques called electro myo graphic bridge (EMGB). It is proposed for non-invasive motor function rehabilitation of all types of paralyzed limbs. The basic system consists of a group of electrodes for signal detection from a healthy limb, a row of signal amplifiers and subsequent signal processors, a wired or wireless signal transmission system, a row of receivers for EMG signal regeneration, and a group of electrodes to make functional electrical stimulation (FES) on the paralyzed limb. Several EMGB prototypes have been designed and used for clinical experiments in several hospitals in Nanjing, Beijing, Hong Kong and other cities. Paretic limbs and fingers of more than 100 hemiplegic or quadriplegic patients have been trained by means of the EMGB instruments, while 100 patients of the same paralytic kind have been trained using existing FES devices as control. Three rating scales, i.e., the FMA score, the MSS score, and the sEMG of autonomous motion, at the begin, after two and four weeks of training, have quantitatively shown that the EMGB instruments have significantly better rehabilitation effects than the existing FES ones. Thus, the effects of the EMGB instrument prototypes have been demonstrated by clinical experiments.

Biography

Zhi-Gong Wang has completed his PhD from Ruhr University Bochum, Germany and Postdoctoral studies from Fraunhofer - Institute of Applied Solid State Physics, Freiburg, Germany in 1992. He is the Director of Institute of RF- & OE-ICs, Southeast University. He is the author or co-author of 20+ books, 500+ SCI/EI/ISTP indexed papers and inventor of 100+ patents of China, Germany, Europe, USA, and Japan. He is senior member of IEEE since 1993, CIE-Fellow since 2017, and Guest/Visiting Professor of 20+ universities of China, Canada and Australian. Recently, he is involved in IC design for radio-frequency and optic fiber communication systems and for bio medical applications.

zgwang@seu.edu.cn

Notes: