Special Session Call for Papers
SMC2015 Special Session on Robotic Exoskeletons with Bioinspired Skills
(SMC2015 BMI Workshop)

Special Session organizer

José M. Azorín,
Brain-Machine Interface Systems Lab
Miguel Hernández University of Elche,
Spain
jm.azorin@umh.es
José L. Pons,
Neural Rehabilitation Group
Cajal Institute, CSIC, Spain
jose.pons@csic.es
José L. Contreras-Vidal,
Laboratory for Noninvasive Brain-Machine Interface Systems
University of Houston, USA
jlcontr2@Central.uh.edu

Important Dates
March 31, 2015: Deadline for submission of full-length papers to special sessions.
June 01, 2015: Acceptance/Rejection Notification.
July 31, 2015: Final camera-ready papers due in electronic form.

Introduction
The Special Session on Robotics Exoskeletons with Bioinspired Skills will be held in the framework of the IEEE SMC 2015’s 5th Workshop on Brain-Machine Interfaces Systems, October 9-12, 2015 in Hong Kong. SMC2015 is the flagship conference of the IEEE Systems, Man, and Cybernetics Society. The main theme of this year’s workshop is: “The Human-in-the-Loop Workshop: BMI, Haptics, Big Data, and Shared Control”.

The possibility of interfacing the human body with artificial devices to then employ these devices to assist human function (e.g. enhance performance, restore neurological function) has long fascinated mankind. The first examples of such interactive devices were industrial robots that had been adapted and brought into manufacturing environments. In the context of assistive technology, robotic exoskeletons are person oriented robots that directly interact with the user to supplement the function of a limb. Over the last two decades remarkable technical accomplishments in design methods have been achieved and have led to a few commercialized products. Despite these technological and mechanical advances and their use in the clinical environment, key issues related to the implementation of robotic exoskeletons in daily life have largely been ignored. The approaches to man-machine interaction put forward by the most recent exoskeletons are not yet taking into account effective strategies for interfacing a exoskeleton to the human body based on the interplay between the neural and the musculoskeletal system.

Indicative Topics/Areas
This session aims at contributing to the discussion on the state of the art and the future trends about interfacing, control and design of robotic exoskeletons. Technologies related to this area, achievements, challenges and open questions would be presented, including the topics (not limited):
- Neuro-interfaces for robotics exoskeletons
- Design of bioinspired exoskeletons
- Applications for robotics exoskeletons
- Rehabilitation using robotics exoskeletons
- Assistance using robotics exoskeletons
- Multimodal interfaces for robotics exoskeletons

Besides presentations of accepted papers, this session will feature a panel, discussions with the audience, and a number of prominent invited speakers from industry and academia.

All accepted papers will be published in the conference proceedings (with ISBN) and in IEEE Xplore.