

Exoskeletons for Augmentation of Human Performance: the fusion between Biomechanics and Robotics

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Soft exoskeleton or exosuits have been introduced in the last decade as possible candidates to overcome the limitations and acceptability of wearable technology.

Although the Exosuits initially promised tangible improvements, yet their soft wearable architecture presents strong drawbacks, placing this technology more in a complementary position rather than on a higher step of the podium respect to their predecessors.

During my speech, I will introduce the progress from our research on soft wearable exosuits at the Assistive Robotics and Interactive Exosuits Lab (ARIES), by presenting novel solutions on mechanical design, novel implementation of control strategies based on machine learning to master the non-linear behaviours. I will discuss in detail how using biosignals by means of realtime techniques based on musculoskeletal dynamics provide a symbiotic interface between the exosuit and the user and also introduce our latest results in clinical applications.