

Title: Bionic limbs and neurorehabilitation of pain

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Abstract: Dr. Ortiz Catalan will present clinically viable technologies to restore quality of life to patients with sensorimotor impairment. He led the development of the first prosthetic arm integrated directly into a patient's bone, nerves, and muscles. The first patient implanted with this neuromusculoskeletal interface has used it without interruption for over 8 years in everyday life. Patients implanted with this new generation of prostheses are also provided with intuitive sensory feedback via direct nerve stimulation. Direct skeletal attachment via osseointegration, along with control and sensory feedback via implanted neuromuscular electrodes, can now be provided in a self-contained prosthesis for use in daily life. Originally developed for above-elbow amputations, this technology is now being implemented for below-elbow and lower limb amputations. Dr. Ortiz Catalan will also discuss a novel hypothesis on the origin and treatment of Phantom Limb Pain, and how motor decoding technology can be used to treat it.

Short Biography: Dr. Max Ortiz Catalán, Ph.D., is the Director of the [Center for Bionics and Pain Research](#) and Associate Professor at the Department of Electrical Engineering, Chalmers University of Technology, Sweden, where he also heads the Bionics Research Unit. He has received several honors, notably the "Swedish Embedded Award" by the Swedish Electronic Association in 2018, the "Brian & Joyce Blatchford Award" by ISPO in 2017, the "Delsys Prize" by Delsys in 2016, and the "European Youth Award" by the European Council in 2014. His research includes bioelectric signals acquisition electronics (analog and digital); bioelectric signal processing and machine learning algorithms for decoding motor volition and control; neuromuscular interfaces; neurostimulation for sensory feedback; bone-anchored prostheses and osseointegration; and virtual and augmented reality for neuromuscular rehabilitation and the treatment of phantom limb pain.