BioTalks: Cutting Edge Advancements in Clinical Prosthetics

March 7, 2017, 1:30pm – 2:30pm
Conference Room, RN Scott Hall

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ABSTRACT: Technology has the potential to allow patients to reintegrate into society after traumatic events leading to amputations or motor impairments. In addition to the functional challenges, these patients often develop chronic neuropathic pain that further hinders their family's quality of life as well as their own. Similarly, children born with congenital malformation face functional challenges to overcome what otherwise are life-permanent handicaps.

This lecture will be about novel but clinically viable technologies to restore patients' quality of life. Using bone-anchored prosthesis (osseointegration), neuromuscular interfaces, and machine learning, Dr. Ortiz Catalan's work resulted in the first bionic arm integrated directly into the patient's bone, nerves, and muscles. In addition to direct skeletal attachment, this technology provides the unique opportunity to chronically record and stimulate the neuromuscular system in freely behaving humans, thus allowing to investigate complex limb motions and somatosensory perception. Dr. Ortiz Catalan will also discuss how motor prediction technology in combination with Augmented Reality can be used to treat Phantom Limb Pain in patients for whom no other treatments were successful.

Dr. Max Ortiz Catalán, Ph.D., is an Assistant Professor at the Department of Signals and Systems, Chalmers University of Technology, Sweden, where he founded the Biomechatronics and Neurorehabilitation Laboratory. Dr. Ortiz Catalán works in close collaboration with the Centre for Advanced Reconstruction of Extremities at Sahlgrenska University Hospital, and serves as a Research Director of Integrum AB, both in Gothenburg, Sweden. Dr. Ortiz Catalán research interests include bioelectric signals acquisition electronics (analog and digital); bioelectric signal processing and machine learning algorithms for pattern recognition and control; neuromuscular interfaces; bone-anchored prostheses and osseointegration; and, virtual and augmented reality for neuromuscular rehabilitation and the treatment of phantom limb pain. Dr. Ortiz Catalán has won several academic and industrial awards such as the "Delsys Prize" in 2016, and the "European Youth Award" in 2014.