Séminaire ISIR

Lundi 21 août 2017 à 13H30

Hugh Herr

Campus Jussieu, 4 place Jussieu, Paris
Salle de réunion 304

On the design of bionic leg devices: the Science of Extreme Interface

Abstract : Critical to the advancement of bionic technology that emulates or extends normal physiological function is the design of extreme interfaces between the human body and electromechanics. In this talk, I describe research activities underway to advance the science of mechanical and electrical interface design. I present novel prosthetic limbs that behave dynamically like their biological counterpart, peripheral neural implants that serve as an electrical interface with the external bionic limb, and novel osseointegration technology for the mechanical and neural transmission of the bionic device to the residual limb. Further, I present a digital nervous system designed to artificially control paralyzed musculature for the restoration of motor function for persons with limb pathology. For each of these interfaces, anatomical, biomechanical and neuromechanical models are employed in the motivation of subsystem design. The therapeutic distinction of bionic technology to increase walking speed, reduce gait metabolism, enhance stability, and mitigate musculoskeletal stress is examined. Finally, critical areas of future research are discussed that must be advanced to step towards the next generation of bionic leg systems.

Short bio : Hugh Herr is head of the Biomechatronics research group at MIT and associate professor in the Harvard-MIT Division of Health Sciences and Technology.

Institut des Systèmes Intelligents et de Robotique
UPMC – CNRS / UMR 7222
Pyramide Tour 55 - Boîte courrier 173
4 Place Jussieu – 75252 PARIS cedex 05 – France
Tél. : +33 (0)1 44 27 51 31 / 51 41
Fax : +33 (0)1 44 27 51 45