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Robotics of motor learning and post-stroke rehabilitation

Etienne Burdet, PhD
Department of Bioengineering
Imperial College London

ABSTRACT OF THE TALK

This talk will give an overview of our activity at the interface of robotics and neuroscience. I will first present results on how the nervous system learns to produce appropriate force and resistance to perturbation, i.e. mechanical impedance. This is critical to understanding how the central nervous system deals with unstable situations in everyday life despite large motor noise, e.g. to work with tools. To infer the related brain mechanisms, we have developed robotic interface compatible with (functional) MRI and able to interact with human motion during imaging. We use analogies between motor learning and rehabilitation to suggest new treatments for stroke survivors. I will describe the dedicated robotic systems we have developed to promote recovery of hand function and initial experimental results.

BIOGRAPHY

Etienne Burdet is Senior Lecturer at Imperial College London. He has obtained a M.S. in Mathematics in 1990, a M.S. in Physics in 1991, and a Ph.D. in Robotics in 1996, all from ETH-Zurich. Dr. Burdet is doing research at the interface of robotics and bioengineering, with contributions in various fields from human motor control to VR-based training systems for surgery and rehabilitation, to assistive devices and microrobotics for life sciences. His main interest is in human-machine interaction.