

IEM SEMINAR SERIES

TUESDAY
FEBRUARY 2nd, 2016



Institute for
Engineering in Medicine
UNIVERSITY OF MINNESOTA
Driven to DiscoverSM

Robotic Rehabilitation and Human Motor Control: Challenges and Opportunities

DR. JÜRGEN KONCZAK

Director of Graduate Studies
School of Kinesiology
Director of Center for Clinical Movement Science
University of Minnesota



FREE event, no registration
required.

Pizza and drinks will be
provided.

12:00PM - 1:00PM
Nils Hasselmo Hall
Room 4-101

For additional information on
Dr. Konczak's presentation,
please contact:
scot0353@umn.edu

The Institute for Engineering in Medicine (IEM) is pleased to announce the IEM Seminar by Dr. Jürgen Konczak "Robotic Rehabilitation and Human Motor Control: Challenges and Opportunities."

Within the next decade the use of robotic devices for rehabilitation will become a standard feature of health care in many developed countries. Economic forecasts expect the robotic rehabilitation market is to grow 40fold within the next years. While the economic future for robotic rehabilitation seems bright, the implementation of robotic devices in clinical care is not without challenges. At present, the data for the efficacy of many robotic protocols are sparse and few randomized clinical trials have documented that they can improve care considerably.

In my presentation I will argue that part of the problem arises from not fully understanding or not addressing the challenges of human-robot interaction. Many robotic rehabilitation devices are uni-directional. That is, they may provide assistive or resistive forces for haptic guidance, but they often lack relevant sensory data on how the human patient makes use of these forces and to what extent and through what modalities these forces can actually be perceived by the patient.

I will present data on several clinical populations including stroke, Parkinson's disease and dystonia, and outline their degree of motor and somatosensory impairment. I will advocate that understanding the underlying pathophysiology will help engineers to understand the challenges that patients face during rehabilitation. This, in turn, provides an opportunity to incorporate this knowledge into the design of a new generation of robotic rehabilitation devices.

Jürgen Konczak is Full Professor at the School of Kinesiology at the University of Minnesota where he heads the Human Sensorimotor Control Laboratory. He holds an adjunct position in the Department of Neurology and currently serves as director of a university-wide Center for Clinical Movement Science that includes 30 faculty from the allied health, clinical, engineering and movement sciences. Dr. Konczak's research focuses on the neurophysiology and mechanics of motor function in clinical and special populations.

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