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## 4<sup>th</sup> Intl. Symposium on Automated Sensor Based Mobility Analysis for Disease Prevention and Treatment

At the 13th Annual International Body Sensor Networks Conference 2016

Date: Tuesday, June 14, Afternoon

Venue: UCSF Mission Bay Conference Center (Room tba), San Francisco, CA, USA

**Organizers:** Jochen Klucken, MD; Bjoern Eskofier, PhD (contact: bjoern.eskofier@fau.de)

### Abstract:

Mobility defines the quality of life in health and disease. Sensor based information on gait and mobility is increasingly introduced into healthy living and disease monitoring. It supports primary prevention, diagnostic work-up and therapeutic decisions in a variety of disorders. In an ageing society, impairment of motor function is of increasing medical and economical relevance. In particular neurological, musculoskeletal and cardiovascular disorders reduce the ability to move independently and limit the autonomy of patients. Even though the disease causing mechanisms are specific for each disorder, mobility in general is limited. This fact makes mobility an important surrogate marker for disease severity and progress, but more importantly for therapeutic decisions and quality of life.

Currently, modern body sensor network based motion detection systems are developed that (I) assess motor function in primary prevention and throughout the course of numerous movement disorder diseases, (II) provide objective measurement for therapeutic efficacy in clinical studies, and (III) support therapeutic decisions.

The symposium will focus on the current knowledge and applications of body sensor network based motion detection systems in the clinic. It will bring together technical experts and physicians specialized in movement disorders to discuss the recent advances in the field of automated mobility analysis. The half-day symposium will provide a forum for academia, clinicians, industry, health insurance, and governing bodies to exchange ideas and to promote collaboration.

This symposium was held for the first time in 2013 during Body Sensor Networks Conference in Boston, USA. The following editions took place in Zuerich, Switzerland, and Boston, USA.

### Speaker list:

Bjoern **Eskofier**, PhD, Pattern Recognition Lab, University of Erlangen-Nürnberg, Germany

Sunghoon Ivan **Lee**, Motion Analysis Lab, Harvard Medical School, USA

Coralie **De Hemptinne**, MD, Dept. of Neurological Surgery, UCSF School of Medicine, USA

Jennifer **Graves**, MD, PhD, Dept. of Neurology, UCSF School of Medicine, USA

Jennifer **Hicks**, PhD, Mobilize Center, Stanford University, USA

John D. **Hixson**, MD, Dept. of Neurology, UCSF School of Med. & SF VA Medical Center, USA

Jochen **Klucken**, MD, Dept. of Molecular Neurology, Universitätsklinikum Erlangen, Germany

Benny **Lo**, PhD, Hamlyn Centre, Imperial College London, UK

Federico **Parisi**, Department of Information Engineering, Università di Parma, Italy

Matthew **Smuck**, MD, Wearable Health Lab, Stanford University, USA

## Symposium program:

<b>13:00</b>	<i>Introduction and Overview of the Symposium</i> Jochen <b>Klucken</b> , MD, Dept. of Molecular Neurology, Erlangen, Germany Bjoern <b>Eskofier</b> , PhD, Pattern Recognition Lab, Erlangen, Germany	
<b>13:10</b>	Robert <b>Richer</b> ; Jochen <b>Klucken</b> , MD Dept. of Molecular Neurology, University Hospital Erlangen, Germany	Unobtrusive Real-time HRV Analysis for the Detection of an Orthostatic Dysregulation
<b>13:35</b>	Matthew <b>Smuck</b> , MD Wearable Health Lab, Stanford University, USA	Physical Performance Monitoring in Mobility Limited Populations
<b>14:00</b>	Federico <b>Parisi</b> ; Gianluigi <b>Ferrari</b> , PhD Wireless Ad-hoc Sensor Networks Laboratory, Università di Parma, Italy	A unified approach to automated IMU-based motion analysis in PD and Post-stroke patients using machine learning
<b>14:25</b>	Jennifer Graves, MD, PhD Department of Neurology, UCSF School of Medicine, USA	The use of wearable sensor technologies to assess disease progression in multiple sclerosis
<b>14:50</b>	<b>Coffee Break</b>	
<b>15:10</b>	Coralie <b>de Hemptinne</b> , MD Department of Neurological Surgery, UCSF School of Medicine, USA	Closed loop deep brain stimulation in Parkinson's disease
<b>15:35</b>	Jennifer <b>Hicks</b> , PhD Mobilize Center, Stanford University, USA	Improving treatment for cerebral palsy with biomechanics and data science
<b>16:00</b>	John D. <b>Hixson</b> , MD Department of Neurology, UCSF School of Medicine and SF VA Medical Center, USA	Emerging biosensor applications for seizure detection and management
<b>16:25</b>	Sunghoon Ivan <b>Lee</b> , PhD; Paolo <b>Bonato</b> , PhD Motion Analysis Lab, Harvard Medical School, USA	Remote monitoring of motor fluctuations in patients with Parkinson's disease using wearable sensors: an overview of the Michael J Fox study
<b>16:50</b> <b>17:00</b>	<b>Joint Discussion</b> <b>End of Symposium</b>	