1st Intl. Symposium on Understanding Inner States of Humans using Measurements of "Invisibles" – "Empatho-Kinaesthetic" Sensing

At the Annual IEEE-EMBS International Conference on Biomedical and Health Informatics jointly organized with the IEEE-EMBS Conference on Wearable and Implantable Body Sensor Networks 2022
Date: September 27 13.30 – 17.00 (afternoon session)
Venue: EUTERPIA A
Organizers: Björn M. Eskofier, PhD; Anne Koelewijn, D Eng, FAU, Germany
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Abstract:
Every movement of the body of a living being is the result of mechanisms of action taking place inside the body and interactions between these. The body's motor functions are initiated and regulated by neuronal processes and, in the case of more complex movements, controlled by sensitive body perception (kinaesthetics, proprioception or depth sensitivity, visual perception) and cognition. Depending on the physical constitution, the state of health or specific states of stress (i.e. physiological, pathological or behavioural states), the movements and the parameters of the (interaction) mechanisms change. Therefore, many physical states are reflected in externally observable movement parameters of the entire body or individual body segments and more refined movements such as cardiovascular or respiratory pulsation processes on the body surface, facial expressions or fasciculations. Examples of the multitude of externally observable movements are micro-vibrations on the surface of the skin as a result of the increased heartbeat during psychological stress, changes in movement patterns in rheumatic and neurological diseases such as arthritis, Parkinson's disease and changes in the heart rate of palliative patients in the dying process.

Currently, the healthcare system relies on cost-intensive and often elaborate processes to diagnose the patients. Furthermore, the systems are primarily built as point-of-care technologies and physician- instead of patient-centred.

The symposium will focus on new ideas, sensors and technologies such as radar, radio, laser and camera sensors to improve the diagnosis process and the daily lives of patients as well as physicians. It will bring together technical experts in biomedical signal processing and physicians specialising in patient care. The symposium will provide a forum for academia, clinicians, industry, health insurance, and governing bodies to exchange ideas and to promote collaboration.

Speaker list:
Theodora **Chaspari**, PhD, Department of Computer Science and Engineering, Texas A&M University, USA
Bjoern **Eskofier**, PhD, Machine Learning & Data Analytics Lab, FAU Erlangen-Nürnberg, Germany
Sevgi Zübeyde **Gürbüz**, PhD, Department of Electrical and Computer Engineering, University of Alabama at Tuscaloosa, USA
Anne **Koelewijn**, D Eng, Machine Learning & Data Analytics Lab, FAU Erlangen-Nürnberg, Germany
Bobak **Mortazavi**, PhD, Department of Computer Science and Engineering, Texas A&M University, USA
Anastasia **Pentari**, M.Sc, Department of Computer Science, University of Crete, Heraklion, Greece
Avik **Santra**, M.Sc, Head of the Advanced Artificial Intelligence Team, Infineon Technologies AG, Neubiberg, Germany
Manolis **Tsiknakis**, PhD, Professor of Biomedical Informatics and eHealth, Department of Electrical and Computer Engineering, Hellenic Mediterranean University, Heraklion, Greece

Symposium Programm:

13.30	*Introduction and Overview of the Symposium* Bjoern **Eskofier**, PhD, Machine Learning and Data Analytics Lab, Erlangen, Germany Anne **Koelewijn**, D Eng, Machine Learning and Data Analytics Lab, Erlangen, Germany	
14.00	Bobak **Mortazavi**, PhD Department of Computer Science and Engineering, Texas A&M University, USA	
14.30	Sevgi Zübeyde **Gürbüz**, PhD Department of Electrical and Computer Engineering, University of Alabama at Tuscaloosa, USA	*Deciphering Human Movement using RF Sensing: Kinematics and Language*
15.00	**Coffee Break**	
15.30	Avik **Santra**, M.Sc Head of the Advanced Artificial Intelligence Team, Infineon Technologies AG, Neubiberg, Germany	*Deep Learning Advancements in mmWave Radar Human Sensing (Remote)*
16.00	Manolis **Tsiknakis**, PhD and Anastasia **Pentari**, M.Sc Professor of Biomedical Informatics and eHealth, Department of Electrical and Computer Engineering, Hellenic Mediterranean University, Heraklion, Greece	*Multimodal approaches for psycho-emotional status recognition in a healthcare context*
16.30	Theodora **Chaspari**, PhD Department of Computer Science and Engineering, Texas A&M University, USA	*Personalized Measures of Invisible States for Augmenting Human Cognition in Communication Settings*
17.00	**Joint Discussion** **End of Symposium**	