Invited Overview Session

Session:	SP1-1.2
Time:	Saturday, December 19, 14:30 - 15:00
Place:	Room Y301
Chair:	Jay C.C. Kuo, University of Southern California (U.S.A.)

Biomedical signal processing and systems' state of the arts and future research challenges

Speaker: Tomasz M. Rutkowski, University of Tsukuba, Japan

Abstract

The lecture will summarize the state research and current activities of the Biomedical Signal Processing and Systems (BioSiPS) Technical Committee member labs from Asia-Pacific. The talk is addressed to biomedical and general signal processing audience, since biomedical monitoring studies cover a wide range of signal analysis and machine learning related problems. Majority of recent hot BioSiPS applications are related to the brain data processing and online interfacing (brain-computer or brain-to-brain interfaces, etc.). There is also a growing interest in sleep studies, which are based on a fusion of biomedical signal processing methods comprising brain (EEG) and body peripheral electrophysiological (EOG, EMG, EKG, etc.), acoustic (breath and snoring sounds), body movements and temperature, skin conductance, etc. The multimodality of the above signals recorded at different scales creates new challenges for BioSiPS applications. There is also a growing interest in biomedical wearables for which energy ef?cient data processing and storage using Internet-of-Things (IoT) technologies will be also reviewed. The lecture will conclude with an outline of the future BioSiPS research challenges.

Biography

Tomasz M. RUTKOWSKI received his M.Sc. in Electronics and Ph.D. in Telecommunications and Acoustics from Wroclaw University of Technology, Poland, in 1994 and 2002, respectively. He received a postdoctoral training at the Multimedia Laboratory, Kvoto University, and in 2005-2010 he worked as a research scientist at RIKEN Brain Science Institute, Japan. Currently he serves as an assistant professor at the University of Tsukuba and as a visiting scientist at RIKEN Brain Science Institute. Professor Rutkowski's research interests include computational neuroscience, especially brain-computer interfacing technologies, computational modeling of brain processes, neurobiological signal and information processing, multimedia interfaces and interactive technology design. He received The Annual BCI Research Award 2014 for the best brain-computer interface project. He is a senior member of IEEE, a member of the Society for Neuroscience, and the Asia-Paci?c Signal and Information Processing Association (APSIPA) where he serves as BioSiPS Technical Committee Chairman. He is a member of the Editorial Board of Frontiers in Fractal Physiology and serves as a reviewer for "IEEE TNNLS, IEEE TSMC - Part B, Cognitive Neurodynamics, and the Journal of Neural Engineering, PLOS One, Nature Scientific Reports, etc.