

Prof. R. Merletti obtained his Ph.D. from the Ohio State University, worked five years in industry, was Tenured Associate Professor at Boston University for four years and he is now Full Prof. of Rehabilitation Engineering at Politecnico di Torino, where he is the founder and director of the Laboratory for Engineering of the Neuro-muscular System (LISiN). He has been involved in six EU projects and two ESA projects, he is a member of the editorial board of four major journals in the field and published over 200 articles in international peer reviewed journals on neuromuscular stimulation and surface electromyography. He is the editor, with P. Parker, of the textbook "Electromyography: physiology, engineering and non-invasive applications" (J. Wiley and IEEE Press, 2004), co-editor of the textbook "Biomedical engineering in exercise and sports" (Minerva Medica, 2006) and co-author of the textbook "Atlas of muscle innervation zones: understanding surface electromyography and its applications" (Springer Verlag, 2012). He claims his main achievement is the training of 10 Ph.D.

Prof. A. Mauro obtained his Specialization in Neurology at Università di Torino Medical School, where he is Full Professor of Neurology in the Dept. of Neurosciences and Director of the Dept. of Neurology and Neurorehabilitation and of the Laboratory of Clinical Neurobiology, Istituto Auxologico Italiano – IRCCS, Piancavallo- Oggebbio (VB). His research activities are in clinical neurology, neurogenetics and molecular neuropathology of neurodegenerative diseases, sleep disorders and neurorehabilitation. He is member of National and International Scientific Societies in Neurological and Neuropathological fields and current President of the Italian Association of Neuropathology and Clinical Neurobiology. He is author of over 130 scientific papers and, in collaboration with D. Schiffer et al., of the 1993 and 1997 editions of the book "Brain Tumors" (Springer – Berlin). In the last 10 years he participated to several research projects and was the group leader in projects founded by CNR, EU, MIUR, Ministero della Sanità, Regione Piemonte and private institutions.

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POLITECNICO
DI TORINO

**Monday, May 13, 2013
9.00 - 13.00**

International Colloquium on Neurotechnology and Neurorehabilitation

Salone d'Onore
Castello del Valentino
Viale Mattioli, 39 - Torino

Abstract

Interfacing with the Central and Peripheral Nervous System, to decode the information flow, is one of the most challenging and fastest developing fields bridging Biomedical Engineering and Neurosciences. Detection of signals from, and application of stimuli to, the Nervous and the Neuromuscular Systems involve areas such as Brain and Body-Computer Interfaces, interpretation of EEG and EMG signals, brain stimulation, neural plasticity, biofeedback and rehabilitation games, robotics and prosthesis control, ergonomics and work-related disorders, sport training and countermeasures to microgravity effects, neuromuscular stimulation for research, functional and therapeutic purposes, as well as assessment of effectiveness of training and treatments in view of health care cost reduction.

The presentations, by four renowned experts in the field, will describe the state of the art and the perspectives for the near future. The most recent achievements and the expected developments of four leading groups will be presented and discussed. Engineering, medical and health professionals and students are invited as well as physical therapists and experts in movement sciences, rehabilitation, occupational and sport medicine, ergonomists, obstetricians.

Programme

Chair: Prof. Roberto Merletti

- 09.00 - 09.15 **Welcome address**
Prof. Marco Gilli,
Rector of Politecnico di Torino, Italy
- 09.15 - 10.15 **Healthcare (Neurotechnology) Innovations: Challenges and Opportunities in the 21st century**
Prof. Metin Akay,
Dept. of Biomedical Engineering,
University of Houston, USA
- 10.15 - 11.15 **Decoding the neural determinants of movement for robust man-machine interaction and integration**
Prof. Dario Farina,
Dept. of Neurorehabilitation Engineering,
University of Göttingen, Germany
- 11.15 - 11.30 **Coffee break**
- 11.30 - 12.00 **Surface EMG Imaging: overview of a new technology with many applications**
Prof. Roberto Merletti,
LISiN, Politecnico di Torino, Italy
- 12.00 - 12.30 **New strategies to shape neural plasticity: from biology to clinical neurorehabilitation**
Prof. Alessandro Mauro,
Dept. of Neurosciences,
Università di Torino, Italy
- 12.30 - 13.00 **Discussion**

Biographies

Prof. M. Akay is the founding chair of the new Biomedical Engineering Department and the John S. Dunn professor of biomedical engineering at the University of Houston. He is the founding editor-in-chief of the Biomedical Engineering Book Series published by the Wiley and IEEE Press and the Wiley Encyclopedia of Biomedical Engineering. He is the founder director of the US-Turkey Advanced Institute on Healthcare. He currently serves on the advisory board of several international journals including the IEEE T-BME, IEEE T-ITIB, He is a recipient of the IEEE EMBS Early Career and IEEE EMBS Service awards as well as an IEEE Third Millennium Medal and is a fellow of IEEE, the Institute of Physics (IOP), the AIMBE and the AAAS. His Neural Engineering and Informatics Lab is interested in developing an intelligent wearable system for detecting coronary artery disease. In addition, his lab is currently investigating the effect of nicotine on the dynamics of ventral tegmental area (VTA) dopamine neural networks.

Prof. D. Farina received the Ph.D. degree in electronics, automatic control and computer science from the Ecole Centrale de Nantes and Politecnico di Torino where he was a post-doc at the Lab. for Engineering of the Neuromuscular System (LISiN). He has been Full Professor of Motor Control and Biomedical Signal Processing at Aalborg, University (DK). In 2010 he was appointed Full Professor and Founding Chair of the Dept. of Neurorehabilitation Eng. at the Univ. Medical Center, Georg-August University, Göttingen. He is also the Chair for NeuroInformatics of the BFNT. Prof. Farina is the current President of the Int. Society of Electrophysiology and Kinesiology. He received the 2010 IEEE Eng. in Medicine and Biology Society Early Career Achievement Award and is Fellow of the American Institute for Medical and Biological Eng.. He is Associate Editor of three international journals. His work has been sponsored by European and national funds including a prestigious Advanced Grant of the European Research Council awarded in 2011. Prof. Farina has (co)-authored more than 260 articles in peer-reviewed Journals and has recently co-edited the IEEE/Wiley book "Introduction to Neural Engineering for Motor Rehabilitation".