

Neuroscience in **Sports**

**smart instruments and methods for assessing
brain's performances on the playground**

**You are cordially invited to join us in the meeting on neuroscience
instruments and methods applied to sport science**

November 26th 2014

15h00 – 19h30

**Haute École d'Ingénierie et de Gestion
du Canton de Vaud**

Route de Cheseaux, 1

CH-1401 Yverdon-les-Bains

SWITZERLAND

PROGRAM OF THE MEETING

WHO YOU ARE

- ✓ sport medicine doctor, neurologist, physiotherapist, psychologist
- ✓ physical trainer, coach, competitions manager, sports manager
- ✓ anti-doping manager, consultant, freelancer, independent specialist
- ✓ biomedical engineer, IT specialist, education program manager
- ✓ rehabilitation professional

WHY YOU SHOULD ATTEND

- ✓ to understand how neuroscience plays a role in sport advancement
- ✓ to discover new smart, simple to use neurophysiology instruments and localization systems for field use
- ✓ to get fresh-new ideas and inspirations
- ✓ to know about new industrial and academic collaborations in the field of sport neurophysiology
- ✓ to confront your research work and solutions with other experienced peers

HOW TO JUSTIFY THIS TRIP TO YOUR BOSS

- ✓ understanding why sport performances will depend on neuroscience research
- ✓ grabbing funding opportunities in establishing successful collaborations
- ✓ strategically planning and boosting your future research or sport experience
- ✓ to avoid reinventing the wheel

Welcome

SHARING THE EXPERIENCE, NOW AND IN THE FUTURE

There is an old joke mocking the foolishness of people, which circulates in various fashions and languages in different Countries. Being a quite frequent traveller, I noticed that, according to the place where the joke is presented, different ethnic or worker groups of the population are mocked: Frisians in Germany, Bretons in France, Carabinieri in Italy, Portuguese in Brazil, Valesians in Switzerland, Koreans in Japan, etc.

In the USA it is up to Californians and the corresponding joke sounds like this:

Q. Why does it take three Californians to change an electric light bulb?

A. It takes one to do the work, and two more to share the experience.

While I deeply apologize with Frisians, Bretons, Carabinieri and other victims of unmotivated and disrespectful mocking, I would like to point out the great truth in the American version of the joke¹.

We do research almost every day and our study is often a lonely and a monastic business. By the way sharing the experience is quite a human tendency and a wonderful means to improve our science and overcome the problems we face.

This meeting has been organized to present the domain and the applications of neurophysiology in sport and the activities performed so far at the "C34-laboratory" of the HEIG-VD.

It will be also a nice opportunity to introduce the collaboration activities in the field of sport technology and medicine which are presently active or planned for the near future. Further opportunities will almost certainly flourish during the meeting.

Sharing the experience, now and in the future: that's the purpose of this meeting which you all are kindly invited to attend.



¹ I thank the teaching of Prof. David J. Dewhurst who very wisely discussed this topic in his book « On the Real Axis » published in 1991 by the International Federation for Medical and Biological Engineering.

General information

THE DATE

November 26th 2014 starting 15h00 to 19h30.

THE VENUE

Haute École d'Ingénierie et de Gestion
du Canton Vaud
Route de Cheseaux, 1
CH-1401 Yverdon-les-Bains Switzerland



Level C, East wing

(new building)

Lecture room: C23

Laboratory room: C34

HOW TO GET THERE

Located in the heart of a natural setting formed by the Jura Mountains, the plains of the Orbe, the hills of the Broye and Lake Neuchâtel, Yverdon is the second most important town in the Canton of Vaud. Famous for its thermal springs and an important regional centre for commerce and tourism, Yverdon is only 90 km by rail or motorway from the international airport of Geneva and 200 km from the Zurich airport. From Yverdon railway station take Travys bus number 601 (direction *HEIG-VD – Gymnase*), get off at HEIG-VD bus stop (1.5 km, 4 minutes; tickets to buy on the platform or from the driver on boarding the bus).

HOW TO REGISTER

Registering to the meeting is FREE, although compulsory for logistic reasons. Just drop an email to: enrico.staderini@heig-vd.ch. Don't forget to indicate your name and affiliation. That's all! Should you need a visa for entering Switzerland, a formal invitation letter will be sent to you.

Schedule

Introduction

15h00 - Welcome

Key lectures

15h15 - Micah M. Murray

The neurophysiologic interpretability of EEG: principles of electrical neuroimaging

15h35 - Juan Carlos Holgado*

Attention and relaxation in elite archery athletes

16h05 - Pasquale Daponte

Measuring human motion in sport activities

16h25 - Enrico M. Staderini

Control of gesture and cognitive evoked potentials

Coffee break and informal get-together

Laboratory hands-on sessions

17h00 - Milo Signorelli

Elicitation and acquisition of cognitive evoked potentials in an archery indoor shooting range

17h30 - Romano Giovannini

WINA: Wireless Indoor localisation and Navigation Aid

Presentation of the collaboration on Sport Science and Applied Medicine with the JNTU Kakinada

18h00 - P.S. Prasad Dandamudi

The M.S. Course in Sport Medicine and Technology at the JNTU Kakinada (AP), India

18h20- Enrico M. Staderini

*The proposed agreement for a joint academic program in Sport
Medicine and Technology*

Closing the event

18h40-Discussion

18h45- Enrico M. Staderini

Conclusions, wrap-up and future activities

Dinner buffet and get-together

Key speakers

MICAH M. MURRAY

Associate professor with the Departments of Clinical Neurosciences and Department of Radiology of the Centre Hospitalier Universitaire Vaudois (CHUV), Micah Murray is director of the EEG Brain Mapping Core CIBM-CHUV in Lausanne, Switzerland. The primary foci of Micah's research are within several domains, including: 1) the functional organization of sensory-cognitive systems, 2) multisensory processing, and 3) the development of methodological and analytical tools for electroencephalography (EEG) in conjunction with functional magnetic resonance imaging (fMRI) and transcranial magnetic stimulation (TMS). These topics have been addressed by applying a wide breadth of state-of-the-art brain imaging and psychophysical methodologies, with a parallel objective being to facilitate transversal interpretations across species, brain imaging techniques, and populations (e.g. healthy cohorts and neuropsychological and neuropsychiatric patients). The underlying technical approach is to use EEG as a neuroimaging technique. This is predicated on the notion that spatio-temporal information is critical for a comprehensive understanding of brain function. Electromagnetic recordings have a major advantage in their high temporal resolution, which is essential for addressing when during sensory-cognitive processing brain areas become active and in what processing step(s) each is involved. Temporal information is equally critical for addressing questions of sequential versus parallel activation, feedforward versus feedback processing, and how information is 'bound' into unified percepts.



JUAN CARLOS HOLGADO

(à vérifier/compléter) Juan Carlos Holgado was born on April 16, 1968 in the city of Dierdorf, a town in the state of Rhineland, which he left at the age of 9 when his family came back to Spain, specifically in the city of Cáceres (Extremadura). As young as a 20 year old archer, he participated in the Seoul Olympics, where he finished in 52nd place in the individual event and 17th in the

team event. At the Olympic Games in Barcelona in 1992 he achieved the biggest result of his career, getting the gold medal in the team event along with Megiddo and Antonio Vazquez Alfonso Menéndez Vallín, finishing 45th in the individual event. In 2000 he got a Bachelor of Physical Education and Sports from INEF, Madrid. In recent years he created the School of archery at the Autonomous University of Madrid and the Polytechnic University of Madrid. He was coaching the team RFETA scholarship of Blume-CAR Madrid and the national team. In the

same year he became part of the technical team of the brand Easton and Hoyt USA as their continued technical advisor. In 1999 he was appointed by the President of FISU Technical Committee Archery and a few months later President of the Coaches Committee FITA (International Archery Federation), starting to teach seminars worldwide as an expert in archery. In 2001 he started working with Arch FEDMF (Spanish Federation of the Physically Handicapped) and as Technical Director of the FMTA (Federation of Madrid archery). In 2002 he moved to Lausanne, Switzerland to collaborate with the FITA office on various projects. After having served in the Organizing Committee of the Athens 2004 Olympic Games as Technical Operation Manager, he started a new challenge in archery, working as event manager at FITA based in Lausanne, Switzerland.

PASQUALE DAPONTE

PASQUALE DAPONTE obtained his bachelor's degree and master's degree "cum laude" in Electrical Engineering in 1981 from University of Naples, Italy. He is a Full Professor of Digital Signal Processing and Measurement Information at University of Sannio - Benevento.

He is President of IMEKO (www.imeko.org) and Vice President of the Italian Association for Electrical and Electronic Measurements. He is member of: Administrative Committee of IEEE Instrumentation & Measurement Society, Working Group of the IEEE



Instrumentation and Measurement Technical Committee N°10 Subcommittee of the Waveform Measurements and Analysis Committee, IMEKO Technical Committee TC-4 "Measurements of Electrical Quantities", Editorial Board of the Measurement Journal, Editor of "IEEE P1658/D00.0 Draft Standard for Terminology and Test Methods of Digital-to-Analog Converter Devices", Co-Chair/Official Reporter of the Working Group for IEEE Std.1241 "Standard for Terminology and Test Methods for Analog-to-Digital Converters". Working Group for IEEE Draft Standard IEEE P 1057-2007/D7.2 for Digitizing Waveform Recorders, IEEE Committee proposing "P1721 - Standard for Objective Measurement of Systemic Arterial Blood Pressure in Humans", SC IEC 47A "Interface integrated circuits - Dynamic criteria for Analogue-Digital Converters (ADC)", IEC/TC85 "Measuring equipment for electrical and electromagnetic quantities", CENCLC_JWGNAWI. He has organised some national or international meetings in the field of Electronic Measurements and European co-operation and served as General Chairman of the IEEE Instrumentation and Measurement Technical Conference for 2006. He is the founder and Chair of the Steering Committee of IEEE Symposium on Measurement for Medical Applications (MeMeA). He is involved in some European projects. He has published more than 260 scientific papers in journals and at national and international conferences on the following subjects: Measurements for Medical Applications in Rehabilitation, ADC and DAC Modelling and Testing, Digital Signal Processing, Distributed Measurement Systems. He is co-author of some patents. In 1987 he was awarded the SOI prize from the Italian Society of Oftalmology (SOI) for the studies on the digital signal processing of the ultrasounds in echo-oftalmology. He was appointed IEEE Fellow in 2009. He received the Laurea Honoris Causa in Electrical Engineering from Technical University "Gheorghe Asachi" of Iasi (Romania) and the "The Ludwik

Finkelstein Medal 2014" from the Institute of Measurement and Control of United Kingdom.



P.S. PRASAD DANDAMUDI

Dr. P.S. Prasad studied at the Rangaraya Medical College, Kakinada where he graduated in 1977. After completing internship he moved to the USA in 1978 and still living in USA. After being specialized in Occupational Medicine & Health he got another postgraduate degree in Environmental Science and Health administration from Loma Linda University, California, USA. He also obtained a Ph.D. in preventive medicine from UK. He worked as vice president, Endocrine Technologies, USA as clinical Research Director. He also worked in the US National Domestic Preparedness Program On Emergency Response on Nuclear, Biological and Chemical Provider Certification given by Federal Government of USA, expertise in Disaster Management program certified by US Government. Dr. P.S. Prasad is a member of: American Medical Association, India Medical Association, California Occupational Health and Safety Org., National Occupational Health and safety Org., American Academy of Occupational & Environmental Health, International Medical & Health Management society, International Ozone association, International Medical science Academy. At present he is the program Director at JNTU Kakinada taking care of two post graduate programs in Sports Science and Applied Medicine and Environmental Occupational Health and Safety.

ENRICO M. STADERINI

After a combined career in the medical practice, the informatics and the biomedical devices industry, Enrico Staderini was invited professor in USA, Brazil, Norway and researcher in Italy teaching medical physics and biomedical engineering. His main research interests focus on UWB medical radars, sport and rehabilitation engineering, biomedical electronics and assistive devices for the elderly and the handicapped people. Enrico Staderini earned a MD degree from the University of Rome, Italy. Then he got a specialization degree (postgrad) in biomedical engineering and a PhD in cardiovascular physiopathology from the same university. He qualified as EUCIP European Certification for Informatics Professionals. A registered physician in Italy, Norway and Switzerland, Enrico is a member of the IEEE, the Swiss Society for Biomedical Engineering (SSGB), the Bern based BioMedical Engineering Club and the Swiss Electromagnetics Research & Engineering Center (SEREC). Presently he is professor of biomedical technologies at the Haute École d'Ingénierie et de Gestion de l'État de Vaud (HEIG-VD) Western Switzerland University of Applied Sciences (HES-SO) within the Industrial Automation Institute in Yverdon-les-Bains, Switzerland.



Participants' list

To be completed at the moment of the event.