

Workshop: Current and future applications of non-invasive and invasive BCIs

Technical University of Cluj-Napoca & “Gheorghe Asachi” Technical University of Iasi & g.tec medical engineering Austria

May 22nd, 2017

Venue: Faculty of Mechanical Engineering, Technical University of Cluj-Napoca

Room: A13 (The Council Room of the Faculty of Mechanical Engineering)

Address: B-dul Muncii, nr. 103-105, Cluj-Napoca

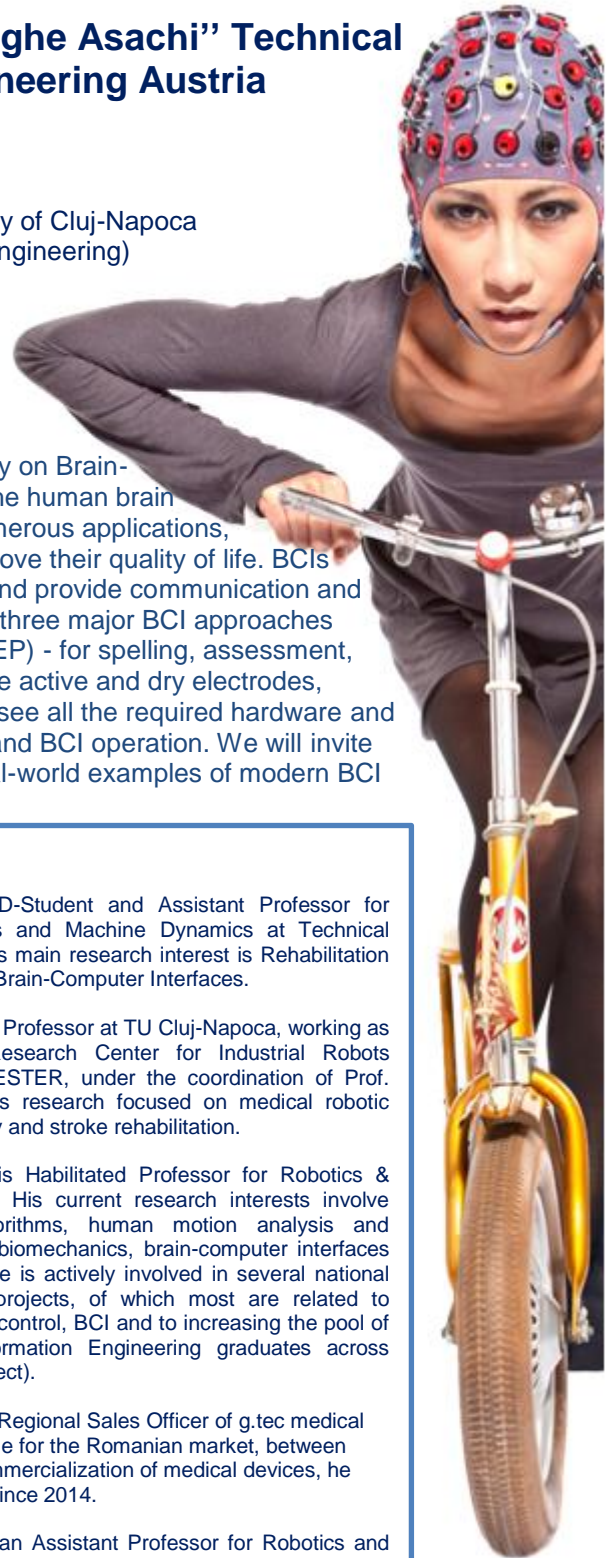
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About the Workshop

Research groups all over the world have been working enthusiastically on Brain-Computer Interfaces (BCIs), which provide a direct connection from the human brain to a computer. BCIs translate brain activity into control signals for numerous applications, including tools to help severely disabled users communicate and improve their quality of life. BCIs have been used to restore movement, assess cognitive functioning, and provide communication and environmental control. During this workshop, we will demonstrate the three major BCI approaches motor imagery, P300 and steady state visual evoked potentials (SSVEP) - for spelling, assessment, rehabilitation and robot control. We will also explain new directions like active and dry electrodes, invasive ECoG systems and advanced VR control. The audience will see all the required hardware and software, procedures for cap mounting, training and classifier setup, and BCI operation. We will invite audience members to participate in live demonstrations, providing real-world examples of modern BCI performance in field settings.



Program:

- 9:00** Workshop Opening
9:10 **Alexandru Ianoși:** *BCI-controlled rehabilitation devices developed at Technical University of Cluj-Napoca*
9:30 **Calin Vaida:** *AgeWell - Innovative Approaches Regarding Rehabilitation and Assistive Robotics for Healthy Ageing*
9:50 **Marian-Silviu Poboronicu:** *TUIASI research related to BCI-based Rehabilitation*
10:20 Coffee break
10:40 **Francisco Fernandes & Danut Irimia:** Introduction to major methodological approaches of BCI & introduction to hard- and software. Theoretical preparation of the hands-on experiments.
12:00 Lunch break
13:00 Hands-on sessions: BCI live experiments, g.Nautilus, RecoveriX
16:00 Final discussion & questions

Attendance is free of charge but registration is required due to limitation of space. Please contact: Dan Mandru dan.mandru@mdm.utcluj.ro, Marian Poboronicu mpobor@tuiasi.ro, Francisco Fernandes: fernandes@gtec.at
N.B.: The workshop will be held in English.

Speakers:

Alexandru Ianoși is a PhD-Student and Assistant Professor for Department of Mechatronics and Machine Dynamics at Technical University of Cluj-Napoca. His main research interest is Rehabilitation Engineering, with a focus on Brain-Computer Interfaces.

Calin Vaida is an Associated Professor at TU Cluj-Napoca, working as a researcher within the Research Center for Industrial Robots Simulation and Testing - CESTER, under the coordination of Prof. Doina Pislă. Since 2005, his research focused on medical robotic systems for surgery, oncology and stroke rehabilitation.

Marian-Silviu Poboronicu is Habilitated Professor for Robotics & Neuroprostheses at TUIASI. His current research interests involve mobile robots control algorithms, human motion analysis and synthesis, neuroprosthetics, biomechanics, brain-computer interfaces and rehabilitation robotics. He is actively involved in several national and international research projects, of which most are related to neuroprostheses design and control, BCI and to increasing the pool of qualified Electrical and Information Engineering graduates across Europe (e.g. SALEIE EU project).

Francisco Fernandes is the Regional Sales Officer of g.tec medical engineering GmbH responsible for the Romanian market, between others. Specialised in the commercialization of medical devices, he has been working with g.tec since 2014.

Danut-Constantin Irimia is an Assistant Professor for Robotics and System Theory at TUIASI. Since 2012 he is also a research collaborator of g.tec medical engineering GmbH focusing on biomedical signal processing and Brain-Computer Interfaces for post-stroke rehabilitation.