

# Brain-Computer Interface (BCI)

## w o r k s h o p & h a n d s - o n s e m i n a r

September 11, 2012

g.tec medical engineering Austria and Oregon Health & Science University

BCI research is one of the most fascinating fields in neuroscience. Imagined movement, focused attention, or other mental tasks lead to changes in the brain's activity patterns which can be measured, analyzed and classified. The transformation of such changes into a control signal allows users to communicate or control external devices just by thinking. BCIs are an amazing technology, helping patients who have lost the ability to interact with their environment. This workshop introduces the major methodological approaches, technical issues, application examples, opportunities and limitations, current trends and much more.

This workshop is intended for people interested in learning the new skill of BCI communication and for people who are interested in combining BCI technology with their field of expertise. The workshop introduces the material about human computer interaction, biosignal analysis in off-line and real-time mode, rehabilitation, biomedical and electrical engineering, computer sciences and Virtual Reality. A hands-on workshop will introduce the hard- and software used for research and development, allowing attendees to try a BCI and communicate just by thinking. Participants can perform live experiments such as P300-spelling, motor imagery BCI for rehabilitation and SSVEP control.



### program

- 10:00 welcome & introduction to the four major methodological approaches of BCI
- 10:30 Keynote: Prof. Barry Oken, Prof. Melanie Fried-Oken  
"Development of a new BCI system based on a Bayesian ERP-Language Model fusion: The RSVP Keyboard for people with functional locked in syndrome"
- 12:00 lunch
- 13:00 hands-on session: BCI live demonstrations
- 15:45 final discussions & questions

Date: September 11, 2012

Venue: 3303 SW Bond Avenue, PDX (OHSU's Center for Health & Healing which is at the South Waterfront at the base of the tram), in Rooms 1A&B of the 3rd floor

### A special thanks to our hosts:

Melanie Fried-Oken, Ph.D., CCC/Sp  
Professor, Neurology, Pediatrics, ENT, BME  
Barry Oken, M.D.  
Professor, Neurology  
Nicole Larimer, Living Laboratory, Point of Care Lab  
Project Manager  
Oregon Health & Science University

### speakers

**Prof. Barry Oken, M.D.** Dr. Oken received a B.A. degree in math from the University of Rochester in 1974 and an M.D. degree from the Medical College of Wisconsin in 1978. After completing a medical internship at the University of Illinois Affiliated Hospitals, he served as resident in Neurology from 1980-1983 at Boston University Medical Center. From 1983-1985 he was a Fellow in Electroencephalography and Evoked Potentials at Massachusetts General Hospital and Fellow in Neurology at Harvard Medical School. Since 1985, he has been a member of the faculty at Oregon Health & Science University.

**Melanie Fried-Oken, Ph.D.** received her Ph.D. in the Study of Language in 1984 from Boston University. As a clinical speech-language pathologist, she has become an international expert in the area of assistive technology, with specialization in Augmentative and Alternative Communication. She is currently the Principal Investigator on an NIH Translational R01 grant to develop a non-invasive brain-computer interface with the RSVP Keyboard. She has been a faculty member at Oregon Health & Science University since 1991.

**Brendan Allison, Ph.D.** earned his graduate degree in Cognitive Science from UC San Diego in 2003. He has been in BCI research for about fifteen years, working with many of the top researchers and groups. He will perform the brain-computer interface workshop for g.tec.

**Nicholas Anderson, Ph.D.** earned his graduate degree from Washington University in Saint Louis in 2008. He has been working with g.tec since 2011 and is now the g.tec product line manager at our partner Cortech Solutions. He is interested in devices and software that interface with and decode signals from the brain for brain-computer interfaces and clinical applications.

Attendance is free of charge, but registration is required because space is limited. Please contact Barbara Vogt ([vogt@gtec.at](mailto:vogt@gtec.at)).



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organized in cooperation of g.tec medical engineering Austria and local universities / research centres

## registration form

Please fill in and fax back to: +43 7251 22240 39  
or send it to [vogt@gtec.at](mailto:vogt@gtec.at)

Venue: \_\_\_\_\_

Date: \_\_\_\_\_

**Name & Degree** (*as to appear on conference materials*):

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Institution/Affiliation:

\_\_\_\_\_

Department:

\_\_\_\_\_

Business Address:

\_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Business Phone: \_\_\_\_\_

E-mail Address (important for receiving the confirmation)

\_\_\_\_\_

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