

# 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

October 04, 2012

g.tec medical engineering Austria and NASA Langley Research Center

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 Brendan Allison: Ph.D.: Code-Based VEP BCIs: Are Conventional SSVEP BCIs Dying?
- 11:30 Dean J. Krusienski, Ph.D.: Brain-Computer Interfaces for Goal-Oriented and Continuous Multi-Dimensional Control
- 12:00 lunch
- 13:00 hands-on session: BCI live demonstrations
- 15:45 final discussions & questions

Date: October 04, 2012  
Venue: Room 137  
National Institute of Aerospace  
(NIA, [www.nianet.org/](http://www.nianet.org/))

#### A special thanks to our hosts:

**Chad L. Stephens** is a Research Scientist at NASA Langley Research Center and a PhD Candidate at Virginia Polytechnic Institute and State University. He received his Master's degree in Experimental Psychology from Virginia Tech based on research into the physiological bases of emotions. His research interests include the psychophysiology of task engagement and workload with particular interest in EEG and HRV-based adaptive automation and applying brain-computer interface capabilities to computer games and simulations.

**Alan Pope** is a Senior Research Scientist at NASA Langley Research Center. He received the MS degree in Electrical Engineering from Tennessee Technological University and the PhD in Clinical Psychology from the University of Florida. His research interests include: applied psychophysiology, biofeedback, adaptive automation, brain-computer interface technology, and physiologically modulated computer games and simulations.

### speakers

**Dean J. Krusienski, Ph.D.**, is an Associate Professor of Electrical and Computer Engineering and Biomedical Engineering at Old Dominion University. He received the B.S., M.S., and Ph.D. degrees in electrical engineering from The Pennsylvania State University, University Park, PA, in 1999, 2001, and 2004, respectively. He completed his postdoctoral research at the New York State Department of Health's Wadsworth Center Brain-Computer Interface (BCI) Laboratory in Albany, NY. His primary research focus is on the application of advanced signal processing and pattern recognition techniques to brain-computer interfaces, which allow individuals with severe neuromuscular disabilities to communicate and interact with their environments using their brainwaves. His research interests include decoding and translation of neural signals, digital signal and image processing, machine learning, evolutionary algorithms, artificial neural networks, and biomedical and musical applications. His research is supported by the National Science Foundation (NSF) and the National Institutes of Health (NIH).

**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)).



Langley Research Center  
<http://www.nasa.gov>  
phone: (757) 864-3293



Cortech Solutions, Inc.  
[www.cortechsolutions.com](http://www.cortechsolutions.com)  
[custsvc@cortechsolutions.com](mailto:custsvc@cortechsolutions.com)  
phone: (910) 362 1143



g.tec medical engineering GmbH  
[www.gtec.at](http://www.gtec.at)  
[office@gtec.at](mailto:office@gtec.at)  
phone: +43 7251 22240

# 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

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*):

\_\_\_\_\_

Institution/Affiliation:

\_\_\_\_\_

Department:

\_\_\_\_\_

Business Address:

\_\_\_\_\_

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

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

E-mail Address (important for receiving the confirmation)

\_\_\_\_\_

g.tec medical engineering GmbH  
www.gtec.at  
office@gtec.at  
phone +43 7251 22240  
fax +43 7251 22240 39

