6TH INTERNATIONAL BCI MEETING

WORKSHOP (W-2)

Passive BCI and Neuroadaptive Technologies

Principal Presenter/Organizer

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Presenters

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Abstract

Passive Brain-Computer Interfaces (pBCIs) provide a tool to assess and interpret information about the cognitive and affective user state in real time, and to adapt a technical system accordingly. The resulting implicit interaction loop can be used for new types of input, augmenting existing forms of Human Machine Interaction as well as enabling completely novel interactive control paradigms. The resulting Neuroadaptive Technology (NAT) holds the potential to revolutionize our current concept of communication between human beings and technical systems.

In the first part of this session we will summarize the state of the art in research about pBCIs and NAT in a presentation with a follow-up discussion. This part aims at providing a common baseline and perspective about the progress in this field for all participants of the workshop. The second part will be a brainstorming session about hurdles to clear for applying Neuroadaptive Technology in real world scenarios. Here, questions about usability, reliability and safety will be discussed as well as needs from the scientific perspective regarding how hardware should be designed and built to overcome previously identified hurdles. Following this, representatives from different companies, both from the audience and the workshop organizers, will provide their perspectives on the previously identified problems and ideas. The third and final part of the session will be moderated, plenary discussion. All participants are invited to discuss previously mentioned topics or share their ideas and concerns.

The moderator will track this discussion and prepare a mind map as an outcome of the discussion.

Intended Audience

This workshop is intended for anybody who is curious about Passive BCIs and Neuroadaptive Technology, for representatives of companies and for scientists already working in this field. It will be organized for an interdisciplinary audience, including human factors experts, neuroscientists, psychologists, HCI/HMS experts, computer scientists and engineers.

BRAIN PRODUCTS
Solutions for neurophysiological research

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Audience Preparation

Participants should prepare a brief oral presentation about themselves, including personal and scientific background and interest in the workshop. Everybody should be familiar with the definitions of Passive BCIs and Human Machine Systems/Human Computer Interaction. Participants are invited to provide a specific topic to the plenary discussion, including questions regarding evaluation of results and computational methods, experimental design and cognitive/affective states of interest, sensors and hardware as well as areas of application and ethics. Participants are invited to send publications they would like to be discussed to the organizers of this workshop.

Learning Objectives

- Participants will learn about the state of the art in Passive BCIs and Neuroadaptive Technology.
- Participants will identify hurdles to applying passive BCIs in real world Neuroadaptive Technology.
- Participants will develop their outlook on the potential of the technology discussed in the workshop

Need for workshop

Passive BCIs have been identified as being an essential technology for the roadmap of future BCI research. Furthermore, Passive BCIs are uniquely relevant to Neuroadaptive Technology, for which there is currently a large interdisciplinary interest. By evaluating applications of NAT, this workshop will connect pBCI to the fields of Human Computer Interaction and Human Machine Systems. Hence, this workshop is intended to bring scientists who are interested in these areas together and to explore the potential of this approach. In addition, the workshop provides the opportunity to share and discuss ideas and concerns with representatives from companies.

Expected Output

The expected output is a summary of the plenary discussion, providing an outlook on different applications of Passive BCIs in Neuroadaptive Technology. This summary is intended to be published in the special issue of the Journal of Neural Engineering.

More details: http://bcisociety.org/meetings/bci-meeting-2016-workshops/