Affective Brain-Computer Interfaces: Preface

This volume contains the abstracts of ABCI 2009, Affective Brain Computer Interfaces, a workshop that was organized in conjunction with ACII 2009, the International Conference on Affective Computation and Intelligent Interaction, held in Amsterdam, The Netherlands, September 2009. The workshop took place on September 9, one day before the main conference in the Keizerzaal at De Rode Hoed, Amsterdam. The workshop explored the advantages and limitations of using neurophysiological signals as a modality for the automatic recognition of affective and cognitive states, and the possibilities of using this information about the user state in innovative and adaptive applications.

Recent research in brain-computer interfaces (BCI) has shown that brain activity can be used as an active/voluntary, or passive/involuntary control modality in man-machine interaction. While active BCI paradigms have received a lot of attention in recent years, research on passive approaches to BCI still desperately needs concerted activity. More than once it has been shown that brain activations can carry information about the affective and cognitive state of a subject, and that the interaction between humans and machines can be aided by the recognition of those user states.

To achieve robust passive BCIs, efforts from applied and basic sciences have to be combined. On the one hand, applied fields such as affective computing aim at the development of applications that adapt to changes in the user states and thereby enrich the interaction, leading to a more natural and effective usability. On the other hand, basic research in neuroscience advances our understanding of the neural processes associated with emotions. Furthermore, similar advancements are being made for more cognitive mental states, for example, attention, fatigue, and work load, which strongly interact with affective states. The topics we have explored in this particular workshop are:

* emotion elicitation and data collection for affective BCI
* detection of affect and mental state via BCI and other modalities
* adaptive interfaces and affective BCI

In this workshop researchers from the communities of brain computer interfacing, affective computing, neuro-ergonomics, affective and cognitive neuroscience have been asked to present state-of-the-art progress and visions on the various overlaps between those disciplines. In addition to the paper presentations there were demonstrations by the company g.tec (Guger Technologies, Graz) and by the Fraunhofer Institute FIRST (Berlin).

The proceedings of the workshop appear as part of a volume of the ACII proceedings published by IEEE Digital Library. We are grateful to the organizers of ACII for accepting our workshop proposal. Program Chairs for ABCI2009 were Brendan Allison (TU Graz, Austria), Stephen Dunne (Starlab, Barcelona, Spain), and Dirk Heylen and Anton Nijholt, both from the University of Twente, Enschede, The Netherlands. Local chairman was Christian Muehl, also from the University of Twente. In the review process we were helped by the following members of the program committee: Anne-Marie Brouwer (TNO Human Factors, Soesterberg, The Netherlands), Peter Desain (Donders Institute for Brain, Cognition and Behaviour, Radboud University Nijmegen, The Netherlands), Grandjean Didier (Swiss Center for Affective Sciences, University Geneva, Switzerland), Stephen Fairclough (School of Psychology, John Moores University Liverpool, United Kingdom), Jonghwa Kim (Institut für Informatik, Universität Augsburg, Germany), Gary Garcia Molina (Philips Research Europe, Eindhoven, The Netherlands), Femke Nijboer (Fatronik - Tecnalia, Donostia, Spain), Ioannis Patras (Department of Electronic Engineering and Computer Science, Queen Mary University of London, United Kingdom), Gert Pfurtscheller (Institute for Knowledge Discovery, Technische Universität Graz, Austria), Thierry Pun (Department of Computer Science, University of Geneva, Switzerland), Egon van den Broek (Faculty of Behavioral Sciences, University of Twente, The Netherlands), and Thorsten Oliver Zander (Department Human-Machine Systems, Technische Universität Berlin, Germany).

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