

Special Issue on Brain-Computer/Machine Interfaces (BCI/BMI)

Dear Colleague:

We are pleased to announce a *Special Issue* of the peer-reviewed journal, *Computers in Biology and Medicine*, dealing with **Brain-Computer/Machine Interfaces**.

BCI/BMI systems allow people to drive prosthetic devices with just their thoughts. Neural decoding algorithms for BCI/BMI systems based on measurements inside or outside the head have developed dramatically during the past decade. Each source signal approach has its specific strengths and weaknesses. Invasive BMI systems acquire neural signals with intracranial, subdural or epidural electrodes while noninvasive BMI systems typically acquire neural signals with scalp electro/magneto-encephalography (EEG/MEG). Some drawbacks of invasive BMI systems are the inherent risks of surgery and gradual degradation of signal integrity that make invasive neural recordings short-lived. Some limitations of current noninvasive BMI/BCI systems are the lengthy training time required by users to achieve satisfactory performance, in part, due to the stereotypic and nonspecific neural signals (most EEG-based BCI systems have focused on modulations of sensorimotor rhythms evoked by imagined movements) used to trigger pre-specified system outputs, the low density recording normally used in these approaches, the presence of physiological and non-physiological artifacts, and the mostly passive EEG recording technologies used in current noninvasive BCI systems.

We intend our *Special Issue* to provide a comprehensive overview of this exciting and rapidly evolving field as applied to the broad field of Graphonomics or fine motor skills such as dexterous finger movements and speech. This Special Issue accompanies the 15th International Graphonomics Society Conference to be held at Live Aqua Cancun Mexico on June 12-15th, 2011 (see <http://www.graphonomics.org/igs2011/index.php>) and potential contributors are strongly encouraged to attend the Conference' Special Session on Brain, Mind & Machines and the control of dexterous finger movements and related fine motor skills. A consensus report from the IGS Special Session will be included in the CBM Special Issue. Exceptional papers presented at IGS 2011 will be also considered for the Special Issue.

We wish to include manuscripts describing the state of the art in the design and validation of BMI systems for both restoration of fine motor function and for rehabilitation after brain injury. Manuscripts focusing on translational BMI research with application in the broadly defined area of graphonomics are particularly welcome. We will include articles dealing with: 1) critical analysis of the state-of-the-art; 2) hybrid BCI/BMI systems that combine multiple source signals or decoding methods; 3) BCI/BMI systems for restoration and rehabilitation of dexterous finger movements, 4) BCI/BMI as a tool for enhancing cortical plasticity, and 5) societal implications, including neuro-ethics of BCI/BMI as applied to teaching, visualization, gaming, virtual reality and enhancement of motor function in able individuals. Please note that papers must have a computational/numerical component.

We invite you to submit a ½ page manuscript proposal for a review, tutorial or original research article on one of the topics listed below:

1. Methods for neural decoding
2. Comparative studies
3. BCI/BMI in Art, Music, Education, Gaming and Human-Computer Interaction
4. BCI/BMI for motor rehabilitation
5. BCI/BMI for restoration of motor function
6. BCI/BMI applications in mental or neurological disorders
7. Modeling of BCI/BMI systems
8. Available software for BCI/BMI applications
9. Other important aspects of this topic (make a case)

The deadline for the ½ page proposal is May 30th, 2011. After consideration of the proposals, formal invitations for full papers will be announced by June 30th 2011. The deadline for invited full papers will be August 27th. All submissions will be subject to the journal's standard peer review and editing processes, and we expect the Special Issue to be published in Winter 2011 or Spring 2012. Proposals should be submitted via email to: cbm.special.issue.bmi@gmail.com

We look forward to your submission.

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