Neuroengineering is a discipline within biomedical engineering. This interdisciplinary approach combines principles from machine learning, signal processing theory, and computational neuroscience applied to problems in basic and clinical neuroscience. Data sources include measurements of neural activity measured using electrode arrays, EEG and MEG, brain imaging data from PET, fMRI and optical imaging methods. The ultimate goal of neuroengineering is a technological revolution, where machines would interact in real-time with the brain. Machines and brains could interface, enabling normal function in cases of injury or disease, brain monitoring and/or medical rehabilitation of brain disorders.

Much current research in neuroengineering is focused on the analysis, visualization and management of these time series data sets, with the goal of understanding the coding and processing of information in the sensory and motor systems, quantifying how this processing is altered in the pathological state, and how it can be manipulated through interactions with artificial devices including brain-computer interfaces and neuroprosthetics.

Our brains are buzzing with electrical activity moving in and out of neural cells, sending electrical impulses along their axons, and exchanging chemical messages. Neural signals allow us to observe neuronal activity in real time.

**Topics covered**
The topics cover all imaging or neural signal processing techniques (cellular-level recording, Spike NN, EEG, MEG, MRI/fMRI, PET, fNIRS, chemical or optical recording) of neuroengineering such as, but not limited to:

- computational neuroscience
- experimental neuroscience
- clinical neurology
- robotics and cybernetics,
- neural tissue engineering
- materials science, and nanotechnology
- electrical engineering and signal processing of living neural tissue,

**Timeline**
- Submissions Deadline: November, 2012
- Publication of special issue: April 2013

**Requirements**
All papers should follow the manuscript preparation requirements for the Springer Cognitive Computation submissions, see [http://www.springer.com/12559](http://www.springer.com/12559). The authors are requested to submit their manuscripts via the online submission manuscript system, available at [http://www.editorialmanager.com/cogn/](http://www.editorialmanager.com/cogn/). During submission, authors should explicitly choose **SI: Neural Signal Processing** in the Subject line.

Should there be any further enquires, please feel free to address them to the coordinating guest editor for the special issue: Jordi Solé-Casals (jordi.sole@uvic.cat). For further (technical) question, please contact the Publishing Editor at Springer, Martijn Roelandse (martijn.roelandse@springer.com).
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