

Innovative neurophysiological techniques for cognitive science and neural engineering: Developmental Opportunities and Challenges

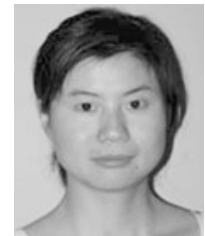
The last decade has witnessed unprecedented advancement in the field of neural engineering, especially towards novel neurophysiological paradigm and neural computational models. At the same time, the relevant field of medical diagnosis and mental disorders also have undergone enormous expansion allowing fabrication of new devices and novel techniques to interface with the central and the peripheral nervous systems. These findings presented an unprecedented opportunity to above research topics that would allow scientists to understand brain functions at multiple scales and foster rehabilitation of patients with various neurological disorders which were unthinkable even a few decades ago. Nonetheless, it is not a trivial task to develop new neurophysiological techniques for neural engineering (like, brain computer interface systems, neural prosthesis, etc.). This requires multidisciplinary approaches consisting of expertise from diverse domains including neuroscience, mechatronics, computer science, electronics, robotics, arts, humanities, etc.

It invites research contributions (both original research and comprehensive survey articles) from all related areas, with a focus on, but not limited to the following topics:

- New paradigms and neural techniques in neurorehabilitation;
- Cognitive and systems neuroscience to neuroimaging and neural signal processing;
- Novel neurophysiological analysis in the cognitive field, including memory, attention, language and others fields;
- Advances in neuroimaging using neural image in cognition functions or mental disorders such as Alzheimer's disease, Parkinson's disease and others;
- Computationally intelligent techniques for neuroscience applications.

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