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Recent Trends, Applications, and Challenges of Brain–Machine Interfaces

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Message from the Guest Editors

The brain–machine interface (BMI), also referred to as the brain–computer interface (BCI), has practical applications to many disciplines, such as brain research, medical rehabilitation, neuroergonomics and smart environment, security and authentication, etc. This involves a range of diverse data acquisition techniques recording brain signals from the scalp, subdural, subcortical, and deep brain structures. These signals include electrocorticograms (ECoG), intracortical signals such as local field potentials (LFP), multi- and single-unit activities (neuronal spikes) for the invasive category, electroencephalograms (EEG), magnetoencephalograms (MEG), functional magnetic resonance imaging (fMRI), and functional near-infrared spectroscopy (fNIRS) for the non-invasive category. These signals require sophisticated processing before they can be used in the application area of BMI/BCI. There are numerous challenges in the pipeline from signal acquisition to application.

This Special Issue aims to collate cutting-edge original research as well as review articles targeting recent trends, applications, and challenges of BMI/BCI.



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