Behavioural Neurology

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Special Issue on

Machine Learning in Neurological and Psychiatric Disorders: A Promising Approach for Clinical Assessment and Prediction

CALL FOR PAPERS

Machine learning techniques have emerged as a promising approach in clinical neuroscience. Most imaging data is highly complex with subtle features reflecting the underlying complexity of the human brain. In neurological and psychiatric disorders, disease-related changes in spatiotemporal dynamics can be difficult to disentangle, particularly in the early stages of the disease, and are further complicated by biological and disease-related variability between individuals. It has become increasingly evident that relying on simple approaches, such as peak activation, EEG epileptic spikes, and region of interest analysis, is not sufficient to unravel disease-related pathological alterations of brain function and to accurately and reliably diagnose and classify neurological and psychiatric disorders.

In the context of early detection and reliable prediction in clinical practice, multimodal imaging and behavioural data should be combined and classified objectively. Machine learning techniques are suited to exactly solve this problem. While many imaging studies have relied on group-averaged data due to the subtle nature of feature differences between healthy controls and patient populations, such approaches do not allow the clinical diagnosis of single subjects. Instead, machine learning techniques are able to utilize numerous imaging and behavioural features from single-subject data to effectively and objectively detect and diagnose brain disorders.

The purpose of this issue is to encourage this development by inviting original research as well as review articles along these lines.

Potential topics include, but are not limited to:

- Machine learning for the detection and classification of fMRI, MEG, EEG, and iEEG spatiotemporal patterns of brain activity
- Machine learning in the classification of epilepsy types
- Automation of clinical assessments via machine learning techniques
- Machine learning in mental-state monitoring from real-time EEG and MEG analysis
- Machine learning approaches for the integration of multimodal imaging data
- Machine learning approaches for the integration of behavioral data
- Machine learning approaches for integrating clinical and imaging data
- Anatomical machine learning techniques for the diagnosis of neurodegenerative diseases
- Performance comparisons of machine learning algorithms applied to neurological and psychiatric disorders

Authors can submit their manuscripts via the Manuscript Tracking System at http://mts.hindawi.com/submit/journals/bn/mlnp/.

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