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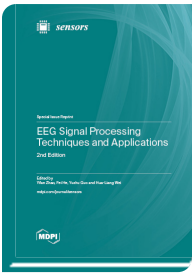
Special Issue Reprint

EEG Signal Processing Techniques and Applications



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Electroencephalography (EEG) is a well-established non-invasive tool used to record brain electrophysiological activity. It is economical, portable, easy to administer, and widely available in most hospitals. Compared with other neuroimaging techniques that provide information about the anatomical structure (e.g., MRI, CT, and fMRI), EEG offers ultra-high time resolution, which is critical in understanding brain function. Empirical interpretation of EEG is largely based on recognizing abnormal frequencies in specific biological states, the spatial–temporal and morphological characteristics of paroxysmal or persistent discharges, reactivity to external stimuli and activation procedures, or intermittent photic stimulation. Despite being useful in many instances, these practical approaches to interpreting EEGs can leave important dynamic and nonlinear interactions between various brain network anatomical constituents undetected within the recordings, as such interactions are far beyond the observational capabilities of any specially trained physician in this field. This reprint provides a collection of original high-quality research in EEG signal pre-processing, modelling, analysis, and applications in the time, space, frequency, or time–frequency domains, particularly in applications of artificial intelligence and machine learning approaches.

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