Doctoral School of Information and Biomedical Technologies

Polish Academy of Sciences

Subject
Comprehensive analysis of brain evoked potentials.

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Project Description

Comprehensive evaluation of reactivity of the central nervous system, which consists of responses of cortical structures is an important method in the diagnosis of neurological disorders such as dementia, epilepsy, multiple sclerosis, and brain tumors. The clinical utility of evoked potentials is based on their ability to demonstrate abnormal sensory system functions, to reveal the presence of demyelinating processes, and to objective monitoring and evaluation of the progression of pathological processes [1]. Topographic distribution of evoked activity and their relationships to brain structure will be investigated in integrated simultaneous EEG-fMRI study using multimodal stimulation during MRI examination [2]. The aim of comprehensive analysis of evoked potentials is to examine the responses evoked by stimuli in various cortex areas. Relationships in time domain as well as topolocalisation of responses [3] will be analysed. Detection of the components identified in brain bioelectric activity due to stimuli requires advanced methods of signal analysis. A goal is also to develop methods of signal analysis for efficient extraction of components contributing to the central nervous system reactivity. Comprehensive evaluation of changes in bioelectrical brain activity in response to stimuli extends interpretation of evoked potentials. Results of this study will have impact on the development of integrated simultaneous examinations of brain structure and functions, as well as on extremely important for modern neurophysiology study of brain plasticity.

Bibliography

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2. Filippi M. fMRI techniques and protocols. Humana Press, 2009.
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