UNIVERSIDAD COMPLUTENSE MADRID

Facultad de Informática

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POSGRADO

Nonlinear methods of analysis of electrophysiological data and Machine learning methods application in clinical practice

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Entrada libre hasta completar el aforo

Resumen:

From last four decades of research it is well-established that all electrophysiological signals are nonlinear, irregular and aperiodic. Since those signals are used in everyday clinical practice as diagnostic tools (EMG, ECG, EEG), a huge progress in using it in making diagnostic more precise and even personally oriented medicine, could be made. One of the obstacles is deeply rooted application of linear methods of analysis which are present even in all the machine software for recording of mentioned signals. Health practitioners are used to it. But they are not used to nonlinear methods of analysis of electrophysiological data, although it is proved many times that in comparison to widely accepted FFT. One of examples is very highly accurate method for classification of recurrent depressive disorder by employing nonlinear characterization of EEG and several machine learning methods in order to detect not only patients from controls but also differences between those who suffer from depressive disorders. Clinicians are aware of close to impossible task for present diagnostic tools to make distinction between exacerbation and remission, which is very dangerous deficiency.

Sobre MILENA CUKIC:

Electroingeneer of biomedical electronics and measurements, she got her PhD from the field of Biophysics and Neuroscience on University of Belgrade. She is Post-Doctoral Fellow on University of Belgrade, and her main interest is the application ofo knowledge from biomedical engineering and nonlinear analysis of electrophysiological data in clinical settings. In her entire education and research several different fields' interests merged into original ideas of application of knowledge from physics, electrodynamics and theory of complex systems in medical practice. Additionally methods taken from machine learning could be applied with very high accuracy on solving several different medical problems, like depressive disorders detection and classification and movement disorders early prediction and detection. Those methods are not only cost-effective but also computationally fast and easy to implement. Currently she is working on several different project with colleagues form Italy,

Serbia, UK, Netherlands and Spain in order to outline a multidisciplinary setting for implementing present knowledge in much more effective clinical diagnostics in psychiatry and neurology.