Neurodegenerative diseases in the era of the digital biomarker

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Abstract

We are in the digital biomarker era in the biomedical and healthcare domain since the generated data through digital devices are growing rapidly. Digital biomarkers are biomedical or health-related data obtained via digital health technologies to interpret and/or predict health-related outcomes. This type of signatures could significantly help bring healthcare from a reactive towards a more preventive approach; hence, research into digital biomarkers will soar in the coming years. Medical research has already recognized the tremendous potential in digital biomarkers, and there are plenty of studies underway to better understand disease and health. This perspective also opens new avenues to unravel the complexity of Neurodegenerative diseases, where there is a significant lack of reliable physiological biomarkers. These disorders are already among the leading causes of disability worldwide, and digital biomarkers can provide promising preventive medicine and healthcare outcomes. Towards this direction, recent computational approaches for identifying digital biomarkers in neurodegenerative diseases are provided. The limitations of current clinical outcome measures for neurodegenerative disorders are described, along with the potential of the emerging digital biomarker research field. Furthermore, a methodological framework is provided to assess, monitor, and design interventions for older adults with cognitive impairments through digital biomarkers. Based on this framework, potential future directions for identifying digital biomarkers on Neurodegenerative Diseases are proposed.

Biography

Panagiotis Vlamos is a Full Professor, Chairman of the University Research Centre, Director of the Bioinformatics and Human Electrophysiology of the Ionian University. He has authored more than 200 papers in peer-reviewed journals and conference proceedings as well as 16 educational books. The topics of his papers are Mathematical Modelling, Applied and Discrete Mathematics as well as Bioinformatics. His main research interest is to help bridge the translational gap from data to models and from models to drug discovery and personalized therapy by developing quantitative deterministic approaches to biological and clinical problems by utilizing high-performance computing.