

## Activity detection and Parkinson's disease symptom monitoring at home

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Lately, the exploitation of advanced body sensor network technologies gains great attention tailored for the patient-centric healthcare. The synergies between the healthcare and engineering communities target the unobtrusive monitoring of patients in uncontrolled home environments to extract objective valuable knowledge for the patient's state. This allows the healthcare professionals to take healthcare back into the patient's own home and increases efficiency of consultations and care delivery. Nowadays, the management of Parkinson's disease (PD) symptoms, particularly in the early stages of the disease, shows good results. However, the long-term treatment is hampered since the available pharmacological therapy is successful only for a limited period, which results in patients developing unmanageable motor complications, which ultimately worsen the quality of life (QoL). Dosage optimization is based on the face-to-face examination of the healthcare expert during the patient's visit and the disease evaluation of day-to-day variations is difficult when relying solely upon periodic consultations. Device-based measures can be used to detect and quantify PD related motor and nonmotor impairments in specific or overall function in activities of daily living (ADLs), improving the management of the disease. Similar devices can also overcome limitations of the current clinical practice, such as low availability of expert PD practitioners or availability of expert

physicians for patients in rural or remote areas.

A system tailored to the needs of PD patients, physicians and caregivers is PDMonitorR, which is a non-invasive continuous monitoring system for PD motor symptoms. The system consists of a set of wearable monitoring devices, a mobile application, which enables patients and caregivers to record medication, nutrition and non-motor status as complementary information for the motor symptom assessment, and a physician reporting tool, which graphically presents to the healthcare professional all patient related information

### Speaker Biography

Dimitrios I. Fotiadis, is a Professor of Biomedical Engineering in the Department of Materials Science and Engineering, University of Ioannina, Ioannina, Greece, where he is also the Director of the Unit of Medical Technology and Intelligent Information Systems, and is also an Affiliated Member of Foundation for Research and Technology Hellas, Institute of Molecular Biology and Biotechnology, Dept. of Biomedical Research. He is the author or coauthor of more than 250 papers in scientific journals, 450 papers in peer-reviewed conference proceedings, and more than 50 chapters in books with more than 12,000 citations (h-index = 57). He is also the editor or coeditor of 26 books. He is a fellow of IAMBES, member of IEEE Technical Committee of information Technology in Healthcare and the Editor in Chief of IEEE Journal of Biomedical and Health Informatics, and Associate Editor for Computers in Biology and Medicine. His research interests include multiscale modeling of human tissues and organs, intelligent wearable/implantable devices for automated diagnosis, processing of big medical data, sensor informatics, image informatics, and bioinformatics. He is the recipient of many scientific awards including the one by the Academy of Athens. He is the co-founder of PD Neurotechnology Ltd., based in London with focus on wearable smart systems for movement disorders.

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