

# New technologies to help patients with Parkinson's disease

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Researchers at the UPM are testing new wearable sensor networks and mobile phone applications to monitor and manage patients with Parkinson's disease.

The research group of Life Supporting Technologies from Universidad Politécnica de Madrid (UPM) has developed a decision support system for healthcare experts that helps them to manage the information generated from the low-cost [wearable sensors](#) which are worn by the patients. These sensors continuously collect and process the accelerometry signals and they automatically detect and quantify the symptom of the patient. All this enables to build a profile of the disease for each patient and achieve a customized treatment.

Population ageing is a global phenomenon caused by improved health systems and demographic changes. In other words, this occurs due to rising life expectancy and declining birth rates. This new reality is a matter of ongoing concern worldwide. Beyond its strictly demographic dimension, population ageing is alarming due to its social, political and financial effects because despite we live longer, we spend more time sick.

Chronic diseases are a growing concern in our society, and this makes necessary to develop and implement some new strategies within the healthcare system that allow doctors to effectively manage these kinds of diseases and improve life quality of patients and the attention and efficiency of the health system. New technologies can bring a great value

in this matter by monitoring patients in an easy and effective way.

In this respect, the group of Life Supporting Technologies at Universidad Politécnica de Madrid has been working on the design and development of new mobile phone applications combined with wearable sensors networks than can be used for continuous non-invasive monitoring of patients with Parkinson's disease. This research group has led the PERFORM project (A soPhisticatEd multi-paRametric system FOR the continuous effective assessment and Monitoring of motor status in Parkinson's disease and other neurodegenerative diseases), an European research project partially funded by the European Commission through the Seventh Framework Programme whose consortium includes universities, hospitals, SMEs and big companies from Spain, Italy, United kingdom, Poland, Cyprus and Greece.

The research aim is the usage of low-cost wearable sensors that can continuously collect and process the accelerometry signals to automatically detect and quantify the symptoms of the patient. Once we this is done, the information is sent to hospital to generate a daily report that will alert the doctor in case of any outlier.

This information is used to develop a decision support system for medical experts in order to help them to manage the generated information and to build a disease profile for each patient, and to achieve a personalized treatment. These researchers not only have worked on the design of the sensors and the algorithms used to monitor patients but also have studied how to improve the user experience for these kinds of systems even among people that are unfamiliar with new technologies.

This group is also working on another project consisting of the usage of aural stimulus, both acoustic patterns which are specifically compound and commercial music. These stimuli are integrated into a [mobile phone](#)

application in a way that patients with Parkinson's disease can do exercises. The aim of this application is that patients can do exercises that help them to improve some motor aspects, especially those related to motion at home. In order to monitor the progress of the [patients](#), this application also uses accelerometers and gyroscopes which are included in most of the latest phones.

**More information:** "Wearability Assessment of a Wearable System for Parkinson's Disease Remote Monitoring Based on a Body Area Network of Sensors". *Sensors*, 2014; 14(9):17235-17255. DOI: [DOI: 10.3390/s140917235](https://doi.org/10.3390/s140917235).

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