

# PROJECT SUMMARY YEAR 1

## Project context

At the current time, measurements of PD symptoms are almost all performed in a clinical setting which is artificial and does not reflect the daily life situation. Obviously this situation is artificial and one cannot draw reliable conclusions for daily living situations from results obtained in such an artificial environment. This leads to misinterpretation of symptoms' occurrence and severity, and consequently to problems with regard to self-awareness of disease state, patient-doctor and patient-caregiver interaction, definition of disease progression, and in choosing the best therapeutic intervention.

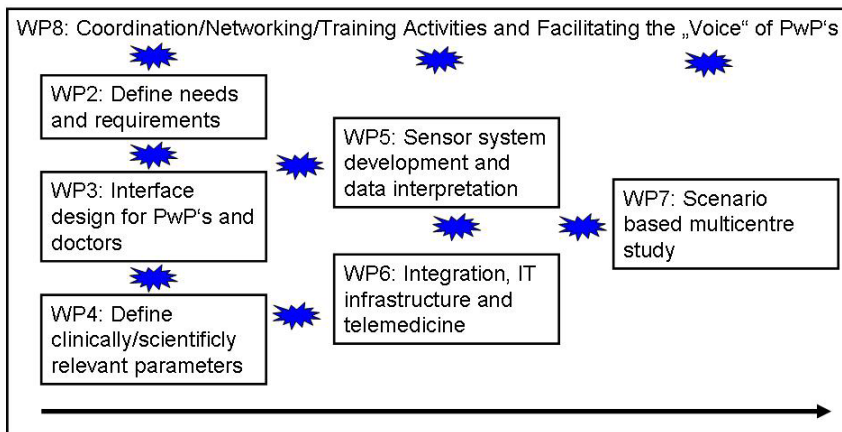
## Objectives

A sensor information and data capture system (SENSE-PARK system) of disease-relevant parameters of PwP's' daily life, including routine activities (first level) and leisure activities (second level) will be developed, and validated by implementation of scientifically established tasks (third level) in the home environment of the user. Feasibility (primary outcome) and usability (secondary outcome) of the system will be tested. Target parameters will be isolated to cover not only motor but also non-motor aspects of the disease.

Taking the different perspectives SENSE-PARK addresses, the objectives of the project are

1. ICT-perspective: to develop, validate and implement a novel multimodal sensor information system which is modular, extendible, adaptive and minimally obtrusive, and which is based on the patients' needs and requirements.
2. PwP's' perspective: to provide disease-relevant information to the user about daily activity performance. This should increase self-awareness and activity, and stimulate the user to overcome frustration and apathy associated with the disease.
3. Clinical and scientific perspective: to provide individual, unbiased, disease-relevant information (a) to the doctor, as a basis for a better medical and occupational therapy as well as to collect data about patterns in the progression of PD, and (b) to the scientist, as the basis for designing disease-relevant progression markers for future therapeutic trials.

## Description of work performed and main results



 ... Interface, interaction, interconnection

SENSE-PARK consists of eight work packages of which the work packages 1 (project management), 2, 3, 4, 5 and 8 have been active in the first twelve months. Work package 6 will start at month 13 has, however, already done preparatory work. Work package 7 will commence at month 25 that is to say at the begin of project year 3.

**Figure 1:** Overview of SENSE-PARK work packages

Main results and milestones reached

Results / milestones	Subsequent action
Needs and requirements of people with Parkinson's disease analysed	Input for technical development, development of a structured feed-back loop for gathering feed-backs from people with Parkinson's throughout the project duration
Symptoms to be monitored by SENSE-PARK prioritised, Symptoms to be implemented through pilot system defined and consented	Technical development of pilot system
Technical implementation for pilot system drafted	Measurement of people with Parkinson's in mock-ups, technical validation, determination of parameters for analysis of measurements

Summary of work performed in the work packages

Work package No	Work package title	Summary of work performed and results achieved
2	Define needs and requirements	<ul style="list-style-type: none"> <li>• Instruments for need analysis and requirements specification identified and described</li> <li>• Analysis of user needs through a questionnaire that was produced and distributed via the Web in the autumn of 2011</li> <li>• Identification of symptoms to monitor</li> <li>• Production of a first list of requirements.</li> <li>• Approach for communication between PwP's and technologists has been developed</li> </ul>
3	Interface design for PwP's and doctors	<ul style="list-style-type: none"> <li>• Determination of relevant problems and requirements of People with Parkinson's in regards to the user interface through two survey amongst People with Parkinson's (PwP)</li> </ul>
4	Define clinically/scientifically relevant parameters	<ul style="list-style-type: none"> <li>• Drafting and revision of a narrative review reporting, from a clinical and scientific point of view, about useful parameters to be detected in the home environment of patients with Parkinson's disease. The paper has been submitted to the Movement Disorders journal, and is currently under review.</li> <li>• Development of a list of measurable symptoms / signs of Parkinson's disease in the home environment</li> <li>• Determination of the most useful hardware solutions to detect those six Parkinson's disease symptoms that have been defined as the most important to be assessed by the SENSE-PARK system.</li> <li>• Proposal on how relevant parameters can be extracted out of the obtained raw data and be validated</li> </ul>

5	Sensor system development and data interpretation	<ul style="list-style-type: none"> <li>• Concept for the Hardware implementation: Concept for the design of the unit for wrist attachment</li> <li>• Implementation of RFID system: A first prototype of RFID system with inertial sensors and power board is currently being developed and tested.</li> <li>• Analysis of first raw data</li> </ul>
6	Integration, IT infrastructure and telemedicine	<ul style="list-style-type: none"> <li>• Development of software requirements specification</li> </ul>
8	Coordination/Networking/Training Activities and Facilitating the "Voice" of PwP's	<ul style="list-style-type: none"> <li>• CPT ran a survey via Parkinson's Movement to obtain quantitative data about the priorities of symptoms.</li> <li>• Select and recruit PwP's to participate in small Focus groups set up to address more specific interaction and feedback required by the partnership going forward.</li> <li>• Coordination and organisation of the Focus group meetings</li> <li>• CPT run a second survey to obtain information about PwPs use of current technologies and their attitude to new technologies as well as to investigate issues of access and practicalities of use in the home.</li> </ul>



Figure 2: SENSE-PARK consortium

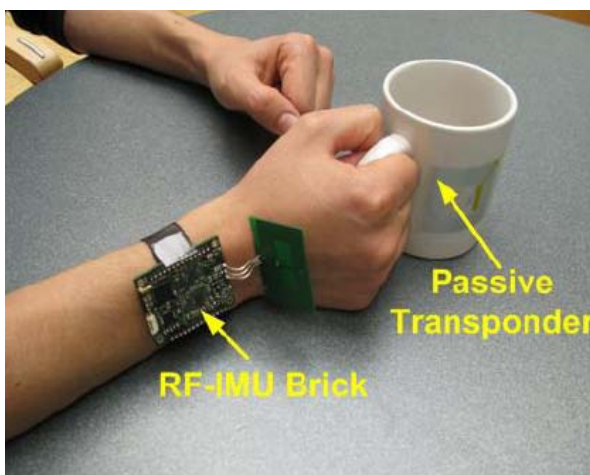


Figure 3: Prototype of RFID with inertial sensor for measurement of daily activity movements.

### **Expected final results and their potential impact and use**

SENSE-PARK aims to develop a novel multimodal sensor information system which is modular, extendible, adaptive and minimally obtrusive, and which is based on the patients' needs and requirements. Its effectiveness will be proven by implementing the pressing and unsolved issues of self-dependent management of Parkinson's as well as provision of accurate parameters for disease modifying therapeutic studies. In case of a successful project, this will generate tremendous research, economical and medical impact. The collaborative research strategy would optimise and promote a fast market uptake after a post-project commercialisation phase.

### **Project web site**

[www.sense-park.eu](http://www.sense-park.eu)

### **Contact**

EU FP7 Project SENSE-PARK (288557)

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