PRESS RELEASE:

Key Research on Technologies for Parkinson's Disease Management Published in IEEE Journal of Biomedical and Health Informatics

Guest editors: Jochen Klucken, Björn Eskofier, Karl Friedl, Jeff Hausdorff

New papers by distinguished researchers explore latest enabling technologies for Parkinson's disease management, including wearables, body sensor networks and smart homes

London, United Kingdom, 2nd November 2015 – The latest technology advances for the clinical management of Parkinson’s disease are explored in cutting-edge research published today by the IEEE’s Journal of Biomedical and Health Informatics (J-BHI). Authored by distinguished researchers in the field, the papers of the Special Issue on “Enabling Technologies for Parkinson’s Disease Management” are available to download now from the IEEE Xplore® Digital Library via http://jbhi.embs.org/

Parkinson’s disease is the most common neurological movement disorder, with a prevalence of up to 2% in the elderly. The new research published in this Special issue represents the edge between the current technical abilities of engineering solutions and clinical applications for the management of Parkinson’s disease, spanning wearable technologies and the Internet of Things, body sensor networks and smart home techniques.

Clinical assessments throughout the course of Parkinson’s disease consume substantial resources and repeated assessments are generally impractical. Most techniques only provide a snap-shot of the patients’ daily life impairments rather than the progression of the disease and efficacy of treatment. From a clinical perspective, sensor-based movement diagnostics offers significant benefits. Sensor-based diagnostics can be conducted remotely in free-living environments, thus improving assessment quality and allowing continuous quantitative assessment. The ability to continuously analyse motor movements during everyday living creates the potential for unobtrusive assessment and monitoring under real-life conditions. This objective information on quality of life and daily functioning could complement the diagnostic workup to greatly enhance disease management and address individual patients’ needs – while ultimately reducing healthcare costs.

Professor Guang-Zhong Yang PhD, FREng, Editor-in-Chief of the IEEE J-BHI comments: “The ability of engineering solutions to deliver early assessment, real-time monitoring, and better rehabilitation of Parkinson’s disease is a key emerging trend for the future successful management of this widespread condition. This special issue, which gathers together the pre-eminent researchers in the field, introduces a number of important new ideas and technologies, including the application of body sensor networks to aid diagnosis, monitoring and treatment for a wide variety of chronic neurologic and musculoskeletal disorders.”
The articles included in this Special Issue are:

- **Body Sensor Network-based Kinematic Characterization and Comparative Outlook of UPDRS Scoring in Leg Agility, Sit-to-Stand, and Gait Tasks in Parkinson's Disease**
  Authors: Parisi, Federico; Ferrari, Gianluigi; Giuberti, Matteo; Contin, Laura; Cimolin, Veronica; Azzaro, Corrado; Albani, Giovanni; Mauro, Alessandro

- **Classification of Parkinson's Disease Gait Using Spatial-Temporal Gait Features**
  Authors: Wahid, Ferdous; Begg, Rezaul; Hass, Chris; Halgamuge, Saman; Ackland, David

- **Contribution of a Trunk Accelerometer System to the Characterization of Gait in Patients with Mild to Moderate Parkinson's disease.**
  Authors: Demonceau, Marie; Donneau, Anne-Françoise; Croisier, Jean-Louis; Skawiniak, Eva; Boutsayamou, Mohamed; Maquet, Didier; Garraux, Gaëtan

- **A System for Real-Time Feedback to Improve Gait and Posture in Parkinson's Disease**
  Authors: Jellish, Jeremy; Abbas, James; Ingalls, Todd; Mahant, Padma; Samanta, Johan; Ospina, Maria; Krishnamurthi, Narayanan

- **Characterization Methods for the Detection of Multiple Voice Disorders: Neurological, Functional, and Organic Diseases**
  Authors: Orozco-Arroyave, Juan; Belalcazar-Bolanos, Ellyn; Arias-Londoño, Julián; Vargas-Bonilla, Jesús; Skodda, Sabine; Rusz, Jan; Höning, Florian; Daqrouq, Khaled; Nöth, Elmar

- **Validity and responsiveness of at-home touch-screen assessments in advanced Parkinson's disease**
  Authors: Memedi, Mevludin; Nyholm, Dag; Johansson, Anders; Pålshagen, Sven; Willows, Thomas; Widner, Håkan; Linder, Jan; Westin, Jerker

- **A Smartphone-based Tool for Assessing Parkinsonian Hand Tremor**
  Authors: Kostikis, Nikolaos; Hristu-Varasakelis, Dimitrios; Arnaoutoglou, Marianthi; Kotsavasiloglou, Christos

- **Prediction of Freezing of Gait in Parkinson's from Physiological Wearables: An Exploratory Study**
  Authors: Mazilu, Sinziana; Calatroni, Alberto; Gaitz, Eran; Mirelman, Anat; Hausdorff, Jeffrey; Troester, Gerhard

- **Dual Motor-Cognitive Virtual Reality Training Impacts Dual-Task Performance in Freezing of Gait**
  Authors: Killane, Isabelle; Fearon, Conor; Newman, Louise; McDonnell, Conor; Waecker, Saskia; Sons, Kristian; Lynch, Timothy; Reilly, Richard

- **What Engineering Technology Could Do for Quality of Life in Parkinson's Disease: a Review of Current Needs and Opportunities**
  Authors: Stamford, Jon; Schmidt, Peter; Friedl, Karl

- **An Emerging Era in the Management of Parkinson's disease: Wearable Technologies and the Internet of Things**
  Authors: Pasluesta, Cristian; Gassner, Heiko; Winkler, Juergen; Klucken, Jochen; Eskofier, Bjoern

- **Analyzing Activity Behavior and Movement in a Naturalistic Environment using Smart Home Techniques**
  Authors: Cook, Diane; Dawadi, Prafulla; Schmitter-Edgecombe, Maureen

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