Guest-Editorial Computer-Based Intelligent Technologies for Improving the Quality of Life

ACCORDING to the United Nations, two billion persons over the age of 60 are projected to be alive by 2050. Moreover, the World Health Organization indicates that the world ratio of disabilities and impairment cases will also augment due to the rapid growing of the population in less developed regions. Finally, the Organization for Economic Co-operation and Development warns about future shortages of available health workers and doctors. By joining the previous three factors, we get a new situation in which the world needs *extra* help for facing health and medical related problems.

Quality of Life (QoL) technologies have emerged in the last few years as a concept of applying research findings in different technological areas to assist people needing extra help in their daily life activities, and to support health workers, caregivers, and doctors in their tasks. Some examples of these technologies include brain computer interfaces, automatic fall detection, rehabilitation robotics, location awareness, or visual impaired people assistance.

This special section appears as a follow up to the preorganized session quality of life technologies that took place at the Fifth International Work Conference on the Interplay between Natural and Artificial Computation in Mallorca, Spain, in 2013. Moreover, its intention is to become a reference for research works in different domains that are interested in computer-based technologies to improve quality of life. Finally, the call for this special section attracted a number of 42 submissions that went through a separate peer review process from which we selected the papers with highest impact and quality.

The paper "Aerial Obstacle Detection With 3-D Mobile Devices," by J. M. Saez, F. Escolano, and M. A. Lozano presents a novel approach for aerial obstacle detection using a 3-D smartphone in the context of the visually impaired people assistance. This kind of obstacles are especially challenging because they cannot be detected by the walking stick or the guide dog.

In "A Smartphone-Based Pocket Fall Accident Detection, Positioning and Rescue System," L.-J. Kau and C.-S. Chen propose a novel algorithm as well as architecture for the fall accident detection and corresponding wide area rescue system based on a smartphone and 3G networks.

P. A. Moreno, M. E. Hernando, and E. J. Gomez describe in the paper "Design and Technical Evaluation of an Enhanced Location-Awareness Service Enabler for Spatial Disorientation Management of Elderly With Mild Cognitive Impairment" the design and technical evaluation of a location-awareness service enabler aimed at supporting and managing probable wandering situations of a person with MCI (PwMCI).

The paper "Improving Compliance in Remote Healthcare Systems Through Smartphone Battery Optimization," by N. Alshurafa, J.-A. Eastwood, S. Nyamathi, J. J. Liu, W. Xu, H. Ghasemzadeh, M. Pourhomayoun, and M. Sarrafzadeh provides a technique to improve smartphone battery consumption and examine the effects of smartphone battery lifetime on compliance, in an attempt to enhance users adherence to remote monitoring systems.

In "Inverse Estimation of Multiple Muscle Activations From Joint Moment With Muscle Synergy Extraction," Z. Li, D. Guiraud, and M. Hayashibe, a synergy-based solution is presented for the inverse estimation of multiple muscle activations from joint movement, focusing on one degree-of-freedom tasks to inversely estimate the multiple muscle activities from the given joint torque sequence.

Moreover, we have several papers about brain computer interfaces using electroencephalography (EEG) since this technique is being widely used to assist people.

V. Mihajlovic, B. Grundlehner, R. Vullers, and J. Penders discuss in the paper "Wearable, Wireless EEG Solutions in Daily Life Applications: What are we Missing?" the state of the art in wireless and wearable EEG solutions and a number of aspects where such solutions require improvements when handling electrical activity of the brain.

The paper "EEG Activity During Movement Planning Encodes Upcoming Peak Speed and Acceleration and Improves the Accuracy in Predicting Hand Kinematics," by L. Yang, H. Leung, M. Plank, J. Snider, and H. Poizner examines whether the correlation between EEG activity during the motor planning and the peak velocity and the peak acceleration were concealed in trial-to-trial decoding from the low SNR of EEG activity.

In "Evaluation of Healthy EEG Responses for Spelling Through Listener-Assisted Scanning," P. Horki, D. S. Klobassa, C. Pokorny, and G. R. Mller-Putz investigate whether listener-assisted scanning, an alternative communication method for persons with severe motor and visual impairments but preserved cognitive skills, could be used for spelling with EEG.

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