Smart Sensors and Pervasive Computing for Healthcare

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There is a trend toward increasingly instrumented environments and deployment of a seemingly invisible infrastructure of various wired and/or wireless networks and communication/computing devices, integrated in our daily life, that facilitate interaction with a smart environment from everywhere. Recent advances in pervasive sensing, mobile, and pervasive computing technologies have led to deployment of new smart sensors and smart sensor networks architectures that can be worn or integrated within the living environment without affecting a person's daily activities. The creation of novel smart environments, context-aware assistive devices, and activity monitoring systems provide great opportunities to improve quality of life, to increase independence in daily living, and to support a wide range of applications and services including mobile telemedicine, patient monitoring, location-based medical services, emergency response and management, personalized monitoring, social support and pervasive access to healthcare information.

The pervasive healthcare system focus towards achieving two specific goals: the availability of eHealth and m-health applications and medical information anywhere and anytime and the invisibility of computing. Furthermore, pervasive health system encompasses new types of sensing and communication of health information as well as new type of interactions among health providers and people, among patients, among patients and researchers, and patients and corporations. In this context and considering my research work in the field of pervasive sensing and smart sensing, several architectures related to wired and wireless sensor network applications as so as elements related to ubiquitous computing for healthcare are presented. Special attention will be granted to the fast prototyping solutions for vital signs and motor activity monitoring as so as the usage of IEEE1451.X smart sensor standards for biomedical applications. At the same time will be discussed the relations between Electronic Health Record and the novel sensing and pervasive computing platforms with application in physiotherapy.

Biography:

Dr. **Octavian Adrian Postolache** graduated in Electrical Engineering at the Gh. Asachi Technical University of Iasi, Romania, in 1992. He received the PhD degree in Electrical Engineering from the Faculty of Electrical Engineering, Gh. Asachi Technical University in 1999. During 1992-2000 he worked as an Assistant Professor and Senior Lecturer at Department of Electrical Measurements and Electrical Materials, Faculty of Electrical Engineering, Gh. Asachi Technical University. In 2000 he received post-doctoral researcher fellowship from Portuguese Science and Technology Foundation. Since 2000 he works as a researcher at Technical University of Lisbon/ IST and Institute of Telecommunication of Lisbon. He is Principal Researcher at Institute of Telecommunication, since 2005. He joined as Assistant Professor at Superior School of Technology/EST-IPS from Setubal since 2001 and from January 2012, as Senior Lecturer in School of Architecture and Information Technology/ISCTE-IUL, Lisbon.

His fields of interests are smart sensors for biomedical and environmental measurement systems, virtual measurement systems, data sensor fusion, instrumentation networks, signal processing of biomedical data for health status and instrumental activity estimation, non-destructive testing and diagnosis based on eddy currents, computational intelligence with application in automated measurement systems. He is currently leader of project regarding the implementation of Electronic Health Records for Physiotherapy (HER-Physio). He worked as a board member of Institute of Telecommunications – Portuguese Telecommunication Agency for Innovation (PT Inovação) - Home TeleCare project; and Institute of Telecommunications and National Communication Agency (ANACOM) - Integrated Spectrum Monitoring project. He was also involved in the project related to development of novel sensors for adequate anesthesia assessment, working in collaboration with Institute of Mechanical Engineering (IDMEC) and Hospital Geral de Santo António, SA (HGSA) from Porto, Portugal. He collaborated also in several researches at Institute of Physiology, Medical Faculty of the University of Lisbon.

Dr. Postolache is author and co-author of 10 patents, 4 books, 12 book chapters, 55 papers in international journals with peer review, more than 190 papers in proceedings of international conferences.

He is IEEE Senior Member I&M Society, Technical Adviser of IEEE EMBS Portugal Chapter, member of International Measurement Confederation. He was member of IMEKO World Congress Organizing Commitee, 2009. He was co-chair of Sensornets 2012, Rome, Italy and chair of Pervasive HealthCare Workshop, 2012, USA, SanDiego. He is member of steering commitee of Medical Measurement and Application Simposium. He is regular member of Technical Comittee of IEEE IMTC, IEEE MeMeA, IEEE IDAACS and IEEE ICST. He is active member of IEEE IMS TC-25 Subcommittee on Objective Blood Pressure Measurement Standard.