

IOT TECHNOLOGIES FOR HEALTHCARE IN EMERGENCY-RELATED ENVIRONMENTS.

Recently, the progress in wearable technologies and the rise of the Internet Of Things (IoT) allowed a massive breakthrough in the amount of biological data that can be gathered from users. Wearables, and more in general, connected sensor nodes can monitor a multitude of vital parameters in an unobtrusive way, that is then integrated and processed in the Cloud exploiting Big Data and machine learning techniques.

However, IoT technologies tend to fail during emergency situations, due to static firmwares and applications or cumbersome dependencies from the Cloud centralized architectures.

Emergencies are characterized by low latency constraints and low or non-reliable bandwidth availability, all coupled with the fact the server downtime is not an option in these situations. We need a profound shift in paradigm to tackle these issues, and their solution could be beneficial also for standard healthcare applications and overall Cloud technologies. Connected devices could be improved to recognize dangerous variations in the acquired data; computational power should be distributed across the communication network to integrate different sources (eg. Sensor embedded vehicles) and to minimize the application latency, with an eye on power consumption constraints; application themselves could operate in a Cloud agnostic manner, avoiding related malfunctionings, while the Cloud acts only as the overseer of these complex systems and executes demanding machine learning algorithms.

This session aims at gathering researchers and experts from computer architectures, biomed, wireless sensor networks and IoT technologies to discuss current requirements and challenges, and to present latest research results in the field as well as industrial successes.

Topics covered:

- Wearable devices
- Sensor fusion for healthcare
- Internet of Things
- Fog Computing
- Adaptive computing systems

José Luis Ayala Rodrigo

Universidad Complutense de Madrid, Spain

jayala@ucm.es

Short Curriculum Vitae

Jose L. Ayala is currently an Associate Professor in the Department of Computer Architecture and Automation at the Complutense University of Madrid. He received his MSc and PhD degrees in Telecommunication Engineering from the Technical University of Madrid, Spain, in 2001 and 2005, respectively. He is member of the HiPEAC European Network of Excellence, IEEE, ACM, IFIP 10.5 and the Council of Electronic Design Automation. He has organized several international events as General Chair and Program Chair, such as VLSI-SoC, GLSVLSI and PATMOS. He has served as TPC member of many conferences, including DATE, DAC, VLSI-SoC, ICCAD, GLSVLSI, etc. He has led and participated in a large number of international research projects and bilateral projects with industry, in the fields of power and energy optimization of embedded systems, and non-invasive health monitoring. His current research interests focus on thermal- and energy-aware design and management of processor-based systems, design of embeded processors, thermal estimation, 3D integration, health monitoring and wireless sensor networks.

Luca Cerina

Politecnico di Milano, Italy

luca.cerina@polimi.it

Short Curriculum Vitae

Luca Cerina is a Research Assistant in Biomedical Engineering and Computer Architectures working at the NECSTLab of Politecnico di Milano on embedded solutions for accelerated biosignals processing.

He is a MSc in Biomedical Engineering, with specialization on electronic technologies at Politecnico di Milano. He also received his Bachelor degree in Biomedical Engineering.

His main research interests cover methods for non-contact cardiovascular signal acquisition and analysis, design of embedded systems for signal processing, and reconfigurable hardware architectures.