

Lecture Notes in Electrical Engineering

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Preface

The 2021 edition of the Conference on “Applications in Electronics Pervading Industry, Environment and Society” was held in mixed mode, i.e., in presence and online, during September 21 and 22, 2021.

The sessions in presence were held at the Aula Magna Pacinotti at the School of Engineering, University of Pisa, in Pisa, Italy.

During two days, about 1 hundred of registered participants, from different entities (Universities and industries), discussed electronic applications in several domains, demonstrating how electronics has become pervasive and ever more embedded in everyday objects and processes.

The conference had the technical and/or financial support of University of Pisa (Prof. Sergio Saponara being the general chair), University of Genoa (Prof. Alessandro De Gloria being the honorary chair), SIE (Italian Association for Electronics), and of the H2020 European Processor Initiative.

After a strict blind-review selection process, 19 short presentations and 25 lectures have been accepted and presented in six sessions (four regular sessions, two short sessions) focused on circuits and electronic systems and their relevant applications in the following fields: High performance computing (HPC) and digital continuum, wireless and IoT, health care, vehicles and robots, power electronics and energy storage, cybersecurity, AI and data engineering.

There were also two scientific keynote sessions, focused on the roadmap of EuroHPC and the European Processor Initiative. The keynote “The European Roadmap Towards High Performance Computing: Industrial and Scientific Perspectives” was held by J. P. Panziera from ATOS (worldwide leading industry in the HPC field) and B. Mohr from FZ Juelich, a German research center leader in Europe for HPC.

The keynote “High Performance Computing Continuum: The Italian Industry in the European Processor Initiative and Pilots” was held by F. Magugliani from E4; D. Ghezzi from LEONARDO; F. Ottonelli and G. Venere from SECO.

The articles featured in this book, together with the talks and round tables of the special events, prove that the capabilities of nowadays electronic systems, in terms of computing, storage and networking, are able to support a plethora of application

domains, such as mobility, health care, connectivity, energy management, smart production, ambient intelligence, smart living, safety and security, education, entertainment, tourism and cultural heritage.

In order to exploit such capabilities, multidisciplinary knowledge and expertise are needed to support a virtuous iterative cycle from user needs to the design, prototyping and testing of new products and services that are more and more characterized by a digital core.

The design and testing cycles go through the whole system engineering process, which includes analysis of user requirements, specification definition, verification plan definition, software and hardware co-design, laboratory and user testing and verification, maintenance management and life cycle management of electronics applications.

The design of electronics-enabled systems should be characterized by innovation, high performance, real-time operations and budget compliance (in terms of time, cost, device size, weight, power consumption, etc.). Design methodologies and tools have emerged in order to support teams dealing with such a complexity.

All these challenging aspects call for the importance of the role of Academia as a place where new generations of designers can learn and practice with the cutting-edge technological tools and where new solutions are studied, starting from challenges coming from a variety of application domains. This approach is sustained by industries that understand the role of a high-level educational system and able to nurture new generations of designers and developers.

The Conference on Applications in Electronics Pervading Industry, Environment and Society has reached, in 2021, its edition number 9, confirming its role as a reference point for a growing research community in the field of electronics systems design, with a particular focus on applications.

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