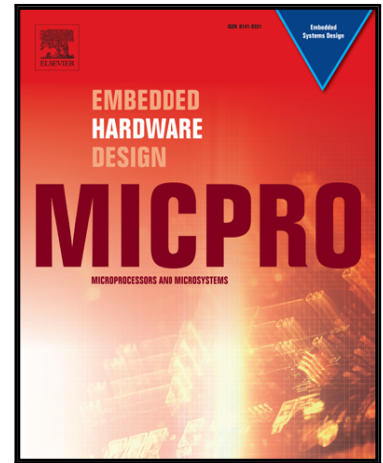


## Journal Pre-proof

Guest Editorial: Special Issue on Intelligent Embedded Systems Architectures and Applications (INTESA)

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Guest Editorial: Special Issue on Intelligent Embedded Systems Architectures and Applications  
(INTESA)

In recent year, embedded systems architectures and applications have gained a lot of interest, especially the possibility to add on-board intelligence has fostered research in several directions, including not only smart IoT and cyber physical systems, but also hot topics such as accelerating deep learning. This special issue contains four papers dealing with architectures and design methodologies to support embedded intelligence, but also providing best practices and software support.

The paper “*A Technologically Agnostic Framework for Cyber-Physical and IoT Processing-in-Memory-based Systems Simulation*”, by Santos et al., aims to focus on Processing-In-Memory (PIM) as a solution for efficiently processing big data. In particular, this work presents a framework to simulate and automatically generate code for IoT PIM-based systems. Moreover, it proposes an high speed and energy efficient architecture for an IoT PIM system, able to compute a real image recognition application.

The paper “*Recommender system implementations for embedded collaborative filtering applications*”, by Pajuelo-Holguera et al., aims to propose a complete recommender system implemented on reconfigurable hardware with the purpose of testing on-chip, low-energy embedded collaborative filtering applications. The proposed approach solves any prediction problem based on collaborative filtering by using an off-line, highly-portable light computing environment. Moreover, this work exploits a custom, fine-grained parallel circuit for quick matrix multiplication with floating-point numbers.

The paper “*SystemC-based Electronic System-Level Design Space Exploration Environment for Dedicated Heterogeneous Multi-Processor Systems*”, by Pomante et al., faces the problem of the Electronic System-Level (ESL) HW/SW co-design of dedicated electronic digital systems based on heterogeneous multiprocessor architectures. In particular, the work presents a prototype SystemC-based environment that exploits a Design Space Exploration (DSE) approach able to suggest an HW/SW partitioning of the system specification and a mapping onto an automatically defined architecture.

The paper “*A Fast and Scalable Architecture to Run Convolutional Neural Networks in Low Density FPGAs*”, by Véstias et al., deals with efficient configurable architectures for Convolutional Neural Networks (CNN) inference targeting any density FPGAs. The architecture exploits fixed-point arithmetic and image batch to reduce computational, memory and memory bandwidth requirements without compromising network accuracy.

In conclusion, this special issue offers some timely contributions to advance the research of intelligent embedded systems by analyzing both architectures and applications. All of four papers are worth reading and will inspire more interesting ideas and research topics.

We sincerely express our gratitude to the Editor-in-Chief of the journal, Prof. Lech Jozwiak for all the valuable advice and constructive comments. We would also like to thank all the reviewers for their hard

work on reviewing the papers. Last but not least, we appreciate all the authors who spent time and effort to respond to this call-for-papers. We truly hope that the readers will enjoy and benefit from this special issue.

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