

Call for Papers IET Computers & Digital Techniques

Editor-in-Chief: Bashir Al-Hashimi, University of Southampton, UK

Special Issue: Designing with Uncertainty - Opportunities & Challenges

Over the past 20 years, computing devices have rapidly improved in performance and function density enabled by the continuous shrinking of technology sizes. However, as device sizes have now approached atomistic scales the statistical nature of intrinsic device variations becomes prevalent. Fabrication yields decrease drastically and failure rates increase significantly as a result, because every physical instance of a design behaves in a stochastically different manner. Despite great efforts and advances in technology and novel materials the laws of Physics and Chemistry will always apply and intrinsic variability, device mismatch and noise will always be present at the lowest levels of any system. Therefore, large complex systems need to be designed taking certain levels of 'uncertainty' at lower levels into consideration. In turn, when assembling larger entities from smaller components, a certain amount of 'uncertainty' in behaviour needs to be expected. In this vein, it is as much about understanding, modelling and predicting variability and noise, as it is about thinking about ways to 'embrace intrinsic variations' and build systems that can robustly function despite these effects.

This Special Issue (related to the 'Designing with Uncertainty - Opportunities & Challenges' Workshop to be held in York from 17th to 19th March 2014, <http://www.panda.ac.uk/workshop/index.html>) addresses these fundamental problems. It will consider fundamental issues related to device modeling, fabrication and measurement; with potential reconfigurable options to alleviate these issues using post-fabrication optimisation and fault-tolerance, and will consider new and emerging devices and materials to solve these problems.

Papers for the Special Issue are solicited on their potential for future developments within the field of device and circuit design and optimisation, addressing areas such as:

- Variability modelling, prediction fabrication and solutions
- Predicting future technologies
- Performance Improvement through reconfiguration
- Designing reliable systems with unreliable components
- Fault-tolerant design, recovery through reconfiguration
- Electronic design optimization
- Design for test, built-in self-test
- New and emerging devices (e.g. biological, carbon, etc)
- Innovative design techniques (e.g. bio-inspired)

All submissions are subject to the journal's peer-review procedures. The authors should follow the journal's Author Guide at <http://digital-library.theiet.org/journals/author-guide> when preparing papers for submission to the Special Issue.



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Important dates:

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