



"Dependability in Industrial Informatics"

The Theme: Dependability is a critical feature of many industrial information and control systems. The development of such systems and ensuring their dependability requires appropriate theories, tools and frameworks to allow designers to deal with large system sizes and complex interactions between system components. Formal methods are rigorous mathematical techniques for specifying, designing and verifying hardware as well as software systems, and can provide key frameworks and analyses for every stage in the development life cycle of dependable systems. Recent advances in formal methods have allowed us in surmounting the state-explosion problem to a certain extent, and there are now numerous success stories involving the use of formal methods for developing of large systems. Examples include frameworks, techniques and tools for functional safety, incremental design, model-based engineering and testing, automatic test-case generation, etc. This special section is devoted to the novel use of formal methods for securing dependability in industrial informatics. In particular, the special section will be focusing on (but not limited to) the following topics:

- Formal requirements engineering including analysis, specification, organization and management of both functional and non-functional requirements.
- Design aspects including architecture specification and analysis, architectural patterns such as model-driven engineering, as well as formal low-level design frameworks.
- Development phase activities aided by formal methods including automatic code generation and optimization, formally composing modules and their interactions, and compositional verification.
- Testing frameworks for automatic test-case generation and execution, static analysis of designs and code, and formal verification of functional and non-functional requirements.
- Run-time verification and management of industrial automation systems.
- Formal methods specific to standards like IEC 61131-3, IEC 61499, IEC 61850, etc. and their extensions.
- Industrial case studies focused on the use of formal methods.
- Automatic formal frameworks and algorithms to reduce designer effort at any stage of the development life cycle.
- Use of formal agent-based approaches, artificial intelligence and visual formal languages for industrial informatics.
- Formal techniques for IT systems quality assurance.

The Dependability and/or Formal Methods contribution and/or relevance have to be emphasized in all contributions.

Manuscript Preparation and Submission

Follow the guidelines in "Information for Authors" in the IEEE Transaction on Industrial Informatics <http://tii.ieee-ies.org/>. Please submit your manuscript in electronic form through Manuscript Central web site: <http://mc.manuscriptcentral.com/tii>. On the submitting page #1 in popup menu of manuscript type, select: SS on **Dependability in Industrial Informatics**. Submissions to this Special Section must represent original material that has been neither submitted to, nor published in, any other journal. Extended versions of papers previously published in conference proceedings may be eligible for consideration if conditions listed in <http://tii.ieee-ies.org/o/PC.pdf> are fulfilled. Before submitting manuscript check the review criteria (<http://tii.ieee-ies.org/o/RC.pdf>) and other information (<http://tii.ieee-ies.org/o/DI.pdf>)

Note: The recommended papers for the section are subject to final approval by the Editor-in-Chief. Some papers may be published outside the special section, at the EIC discretion.

Timetable:

Deadline for manuscript submissions
Expected publication date (tentative)

June 30, 2016
November 2016

Guest Editors:

Valeriy Vyatkin, Luleå University of Technology, Sweden and Aalto University, Finland
Luis Gomes, Universidade Nova de Lisboa, Portugal
Roopak Sinha, Auckland University of Technology, New Zealand
Stavros Tripakis, University of California at Berkeley, USA and Aalto University, Finland