# Call for Papers: Special Issue on Autonomous Systems Design

## Aim and Scope

Autonomous systems perceive and monitor their environment, form their own representation of the current state of the world including themselves, and make appropriate adaptation and control decisions in order to optimize a set of objectives. Such systems are becoming more and more integral parts of many Internet-of-Things (IoT) and Cyber-Physical Systems (CPS) applications. Automated driving constitutes today one of the best examples of this trend.

However, with the increasing autonomy, the systems design becomes very challenging in order to accommodate the unique combination of high functional complexity, heterogeneity of application and HW/SW platforms, secure connectivity and further dependability requirements with respect to functional safety, availability and real-time reactivity. Verification and validation of autonomous functionality involves guaranteeing safety and security in the presence of several unknowns. This includes the process used for learning environment assumptions and then training the control/decision-making software, and the inherent uncertainty and incomplete information from the operating environment. Safety verification and validation thus remains one of the hardest challenge problems for autonomy. In addition, the resource-efficient implementation of the highly complex autonomous functionality demands for innovative solutions, e.g. to achieve time-predictability for self-adaptive applications on heterogeneous HW platforms.

This special issue will explore recent industrial and academic methods and methodologies in the design, verification and validation of autonomous systems. The goal is to provide a global and interdisciplinary view of current trends in autonomous systems design.

## Topics of Interest

Specific topics of interest include but are not limited to the following:

- embedded and cyber-physical systems platforms that implement and execute the autonomous system functions including aspects related to their architectures, hardware, software and communication,
- the design of autonomous systems including processes, modeling, optimization, verification, validation, and test
- all aspects of dependability in autonomous systems design including, but not limited to, functional safety concepts, fail-operational systems design, functional safety for applications with machine learning, safe and secure adaptions and updates, autonomous systems security
- case studies of autonomous systems design using innovative architectures, methods and tools

The special issue particularly welcomes and encourages the submissions from industry or collaborative works between industry and academia for this fast growing area.

## Submission Guidelines:

Prospective authors should follow the submission guidelines for IEEE Design & Test. All manuscripts must be submitted electronically to IEEE Manuscript Central at https://mc.manuscriptcentral.com/dandt , a specific special issue category will be available and selectable from a menu. All articles will undergo the standard IEEE Design & Test review process. Submitted manuscripts must not have been previously published or currently submitted for publication elsewhere.

Manuscripts must not exceed 5,000 words, including figures (with each average-size figure counting as 200 words) and a maximum of 12 references (50 for surveys). This amounts to about 4,000 words of text and a maximum of five small to medium figures. Accepted articles will be edited for clarity, structure, conciseness, grammar, passive to active voice, logical organization, readability, and adherence to style. Please see IEEE Design & Test Author Resources at http://ieee-ceda.org/publication/ieee-design-test-dt/paper-submission-instructions for links to Submission Guidelines Basics and Electronic Submission Guidelines and requirements.

## Schedule:

- Manuscript submission:     May 31, 2019
- First round of reviews:     July 19, 2019
- Revised Manuscripts Due: August 09, 2019
- Second round of reviews:   September 06, 2019
- Final manuscripts due:      September 20, 2019

Submission Website: https://mc.manuscriptcentral.com/dandt

## Guest Editors:

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