# Call for Papers

**Special Issue on**

## "*Intelligent Sensing, Planning and Control for Autonomous Driving Vehicles*"

**IEEE Transactions on Systems, Man, and Cybernetics: Systems**

The *IEEE Transactions on Systems, Man, and Cybernetics: Systems* calls for research paper submissions for considering in a Special Issue publication featuring on intelligent sensing, planning and control for autonomous driving vehicles. Unpublished original contributions from prospective authors are invited for consideration by the special issue, subject to blind reviews, with main focus on new theory and technologies for improving the performance of autonomous driving vehicles in complex, uncertain environments. Comprehensive case studies and in-depth review papers will also be considered.

In the past decades, intelligent vehicles have received increasingly significant attention due to their great potential in enhancing vehicle safety and performance, and traffic efficiency. One of the key objectives of intelligent vehicles is to realize a high degree of autonomy under dynamic, complex environments. From multi-disciplinary perspectives including robotics, computer vision, artificial intelligence, control theory, et al, many research efforts have been devoted to improving the performance of autonomous sensing, planning and control abilities for intelligent vehicles. Furthermore, due to the requirements of unknown complex environments, it is necessary for intelligent vehicles to have improved learning ability such as online learning and driving skill learning from past experiences for sensing, planning and motion control. In real-world traffic, there are various uncertainties and complexities in road and weather conditions, objects and obstacles are dynamic, as is the interaction between the tires and the driving terrain, etc. An autonomous vehicle has to deal with the following technical challenges: (i) to rapidly and accurately detect, recognize and track dynamic objects with complex backgrounds, (ii) to build accurate maps and realize self-localization in uncertain, dynamic environments, (iii) to implement motion planning and avoid dynamic obstacles with multiple goals such as safety, agility, and traffic efficiency, and (iv) to learn from past experience and reuse the learned knowledge to continually improve driving performance. This special issue seeks to explore the areas related to these challenges.

**Topics of the special issue interests and focuses include, but not limited to**

- Real-time object detection, recognition and tracking for intelligent vehicles
- Map building and localization of intelligent vehicles
- Deep learning for real-time sensing of intelligent vehicles
- Deep reinforcement learning for autonomous control of intelligent vehicles
- Autonomous decision-making for intelligent vehicles
- Motion planning of autonomous vehicles
- Path tracking and motion control for intelligent vehicles
- Intelligence tests for autonomous vehicles
- Other machine learning approaches with applications in autonomous vehicles

**Important Dates**

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| Manuscript Submission Deadline: | July 31, 2017 |
| Notification of Paper Decision: | November, 2017 |
| Revised Paper Submission Deadline: | March, 2018 |
| Final Paper Submission Deadline: | May, 2018 |
| Publication Date: | June, 2018 |

**Manuscript and Submission**

Preparation of manuscripts should refer to the guidelines in the "Information for Authors" on the IEEE Transaction on System, Man Cybernetics: System website:
http://www.ieeesmc.org/publications/transactions-on-smc-systems/information-for-authors

Submission for the special issue should be submitted through the Manuscript Central web site: https://mc.manuscriptcentral.com/systems. In the Cover Letter to Editor-in-Chief Section, authors should explicitly include the following statement: This manuscript is submitted for the Special Issue on "**Intelligent sensing, planning and control for autonomous driving vehicles**".

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