

SPECIAL ISSUE ON

DATA-DRIVEN LEARNING FOR AUTONOMOUS DRIVING

Aims and Scope

Autonomous driving system is expected to play a key role in the future of the next transportation systems, which has received considerable attention from many companies and research institutions. On the one hand, complex road structures, diverse traffic participants, and the long tail of rare events pose a great challenge to the autonomous driving system. On the other hand, data-driven learning methods including deep learning, reinforcement learning, self-supervised learning have achieved numerous successes over the past decade (image recognition, natural language processing, chess and MOBA games, and so on). Especially, deep learning has greatly enhanced the perception and prediction ability of autonomous driving system, and deep reinforcement learning also brings new opportunities to improve the planning and control ability for complex interactive scenarios. Recently, the data-driven approaches based on deep learning, deep reinforcement learning and end-to-end learning, which are considered as the key approach of Autonomy 2.0, have been investigated widely to address the perception/prediction/navigation/planning/control tasks instead of the traditional methods for autonomous driving. The objective of this special issue is to discuss the recent development and existing problems of data-driven learning methods and applications in autonomous driving.

Topics

This special issue is targeted on general readership articles about design and application of data-driven learning technologies for autonomous driving. Topics of interest include, but are not limited to:

- Survey/Benchmark on data-based learning methods for autonomous driving
- Offline reinforcement learning and safe reinforcement learning algorithms
- Simulation to real transfer learning algorithms
- The integrated algorithms of reinforcement learning with domain knowledge
- New algorithms of deep learning and deep reinforcement learning
- Deep learning algorithms in autonomous driving perception and prediction
- Reinforcement learning algorithms in autonomous driving planning and control

- Deep reinforcement learning combined with search algorithms in autonomous driving interactive decision-making
- End-to-end learning algorithms for autonomous driving
- Interpretable machine learning and Trustworthy AI for autonomous driving
- Learning-based control for autonomous vehicle/electric vehicle
- Human-machine interaction in autonomous vehicles
- Simulation and hardware design for autonomous driving

Submission

The IEEE Computational Intelligence Magazine (CIM) publishes peer-reviewed high-quality articles. All manuscripts must be submitted electronically in PDF format. Manuscripts must be in standard IEEE two-column/single space format and adhere to a length of 10 pages (including figures and references) for regular papers. A mandatory page charge is imposed on all papers exceeding 10 pages in length.

More information on manuscript details and submission guidelines can be found at

- Special Issue website: <https://sites.google.com/view/ieee-cim/si>
- IEEE CIM website: <https://cis.ieee.org/publications/ci-magazine/cim-information-for-authors>

Important Dates

- Manuscript Due: **May 31, 2023**
- First Notification: July 31, 2023
- Revision Due: August 31, 2023
- Final Notification: September 30, 2023

Guest Editors

- **Qichao Zhang**, Chinese Academy of Sciences, China
- **Zhen Ni**, Florida Atlantic University, USA
- **Danial Prokhorov**, Toyota Technical Center, Japan
- **Dacheng Tao**, JD Explore Academy, China