Call for Special Session Proposals

26th IEEE International Conference on Intelligent Transportation Systems

The 26th edition of the IEEE International Conference on Intelligent Transportation Systems (ITSC 2023) is the annual flagship conference sponsored by the IEEE Intelligent Transportation Systems Society (ITSS). This event hosts an attractive agenda of technical contributions, keynote presentations, tutorials, special sessions, and workshops on topics related to the field of Intelligent Transportation Systems (ITS). The conference aims to gather researchers and practitioners working in this field towards sharing, discussing, and opening new paths in the theory, analysis, simulation, data-based modeling, experimentation, deployment, and case studies embracing transportation and mobility at their core. In particular, ITSC 2023 builds upon its motto to invite and encourage prospective authors to present results, findings, perspectives, and developments related to the implementation and deployment of ITS applications that consider human interaction at the core of their design.

ITSC 2023 solicits proposals for half-day and full-day special sessions covering topics that are relevant to the field of intelligent transportation systems and its applications. Interested organizers are invited to submit their special session proposals in the topic areas listed in the Call for Papers of the conference (https://2023.ieee-itsc.org/call-for-paper/call-for-papers/).

The special session proposal should include title, scope, organizers, topics of interest, list of potential contributors, intended audience, expected attendance and material needed for the special session. The proposal must be submitted electronically by following the instructions available in the conference website (https://2023.ieee-itsc.org/). The deadline is February 15th, 2023.

Disclaimer 1: any special session proposal that is incomplete and/or is not submitted by following this form will not be evaluated for its inclusion in the program of the conference.

Disclaimer 2: the minimum number of contributions in a special session is 5 (half-day proposal) and 10 (full-day proposal). Special sessions that receive less than these thresholds will not be allocated as such in the in the program of the conference.
Special Session Proposal

- **Title:**
  - Cooperative Driving in Mixed Traffic (ITSC 2023)

- **Modality:**
  - Half day (3 hours without breaks)

- **Scope (no longer than 4 pages), including the following sections:**
  - **Motivation and general scope:**
    
    With the advancement of vehicle-to-everything (V2X) communications, the concept of cooperative driving has been attracting increasing attention from both academia and industry. Connected vehicles, either driven by human drivers or automated controllers, are able to coordinate with each other or infrastructures through V2X communications in certain traffic scenarios to improve the overall performance. Cooperative Adaptive Cruise Control (CACC), cooperative ramp merging, connected eco-driving at signalized intersections, automated coordination at non-signalized intersections, among other cooperative driving applications of connected vehicles, have the potential to benefit the transportation system in terms of safety, mobility, resilience, and/or environmental sustainability.

    However, the market penetration rate of connected vehicles is expected to evolve gradually. There will certainly be a transition period where only a portion of the vehicles traveling in the traffic environment are connected (and potentially automated), while others have no V2X capabilities – either automated vehicles equipped with on-board sensors or legacy vehicles driven by human drivers. How to perform cooperative driving maneuvers in mixed traffic environments to allow the coordination among all these vehicle types remains an open research question.

    This will be the third special session of the series, focusing on cooperative driving in mixed traffic. It focuses on sharing the state-of-the-art design, modeling, algorithms, simulation, and field implementation of cooperative driving in mixed traffic, and identifies challenges as well as research needs, aiming to encourage cross-disciplinary cooperation.

  - **Relevance to the ITS community:**
This series of special sessions have been held for the past two years. It attracted plenty of audience and attendance on ITSCs. The topic of this special session is still hot in existing journals and conferences in the ITS community. Related research directions on this topic, such as automation, vehicle cooperation, mixed traffic control, etc., have been attracting amounts of publications and applications from the ITS community.

- Topics of interest for the special session:
  - Cooperative perception or situation awareness enabled by sensors on multi-vehicles or sensor fusion between vehicles and infrastructure
  - Driving behavior modelling and driver intention inference
  - V2X–based cooperative motion planning and motion control
  - Cooperative driving methodologies for modelling the interaction between human–driven vehicles and automated vehicles
  - Application of advanced machine learning techniques to cooperative driving
  - Cyber security of cooperative driving systems
  - Communication standard (including messaging) to enable cooperative driving
  - Interaction between vehicles and vulnerable road users
  - Advanced simulation of cooperative driving applications in mixed traffic

- Organizers (names, affiliations, emails, and short bio):
  
  - Ziran Wang, Purdue University, ziran@purdue.edu, is a Tenure-Track Assistant Professor at the Purdue University College of Engineering. Prior to joining Purdue, Dr. Wang worked for Toyota R&D in Silicon Valley as Principal Researcher of Digital Twin. He also serves as Founding Chair of IEEE Technical Committee on Internet of Things in Intelligent Transportation Systems, and Associate/Guest/Handling Editor of five academic journals, including IEEE Internet of Things Journal, and IEEE Transactions on Intelligent Vehicles. His achievements were demonstrated on Consumer Electronics Show (CES) in Las Vegas, and acknowledged by four best paper awards, the First Prize in IEEE Shape the Future of ITS Competition, and the U.S. Department of Transportation Dissertation Award. Dr. Wang is an author of 40+ refereed publications and 50+ patent applications. He received the Ph.D. degree in Mechanical Engineering from the University of California, Riverside.

  - Jia Hu, Tongji University, hujia@tongji.edu.cn. He works as a ZhongTe Distinguished Chair in Cooperative Automation in the College of Transportation Engineering at Tongji University. Before joining Tongji, he was a research associate at the Federal Highway Administration, USA (FHWA). He is an Associate Editor of the IEEE Transaction on Intelligent Transportation Systems, the IEEE Transaction on Intelligent Vehicle, American Society of Civil Engineers Journal of Transportation Engineering, IEEE Open Journal in Intelligent Transportation Systems, an assistant editor of the Journal of Intelligent Transportation Systems, an advisory editorial board member for the Transportation Research Part C, an associate editor for IEEE Intelligent Vehicles Symposium since 2018, and an associate editor for IEEE Intelligent Transportation Systems Conference since 2019. Furthermore, he is a member of TRB (a division of the National Academies) Vehicle Highway Automation Committee, Freeway Operation
Committee and Simulation subcommittee of Traffic Signal Systems Committee, and a member of CAV Impact Committee and Artificial Intelligence Committee of ASCE Transportation and Development Institute.

- **Meng Wang**, TU Dresden, meng.wang@tu-dresden.de. He is a Professor and Head of Chair of Traffic Process Automation at the “Friedrich List” Faculty of Transport and Traffic Sciences, TU Dresden. Prior to this post, he was an Assistant Professor (2015-2021, tenured in 2019) at the Department of Transport & Planning of TU Delft and the Co-Director of the Electric and Automated Transport lab (hEAT lab). He was the General Chair of the 4th Symposium on Management of Future Motorway and Urban Traffic Systems 2022 (MFTS2022) the Program Chair of IEEE Forum on Integrated and Sustainable Transportation Systems 2020. He is a member of TRB’s standing committee on Vehicle Highway Automation, and an Associate Editor of the journal IEEE Trans. on ITS, IET ITS, and Transportmetrica B. He is the recipient of the IEEE ITS Society Best PhD Dissertation Award (2015) and IEEE ITSC Best Paper Award (2013). His main research interest lies in ITS, with a focus on traffic system dynamics and control.

- **Jiaming Wu**, Chalmers University of Technology, jiaming.wu@chalmers.se. He is currently a researcher in the Department of Architecture and Civil Engineering at Chalmers. He serves as an Associate Editor of Journal of Intelligent and Connected Vehicles, Editorial board member of Multimodal Transportation, and organizing committee member of KES International conference on Smart Transportation Systems. His research interests include connected and automated vehicles platoon control, signalized intersection control, and vehicle routing problems.

- **Qiuchen Wang**, Scania, qiuchen.wang@scania.com. He works at Scania Research and Innovation office, focusing on establishing and managing strategic research cooperation and implementation between industry-university in China and Europe. She studied at Beijing Jiaotong University and KTH Royal Institute of Technology and participated in EU7 and Swedish research projects. Her research background is in transportation engineering and multi-actor influence in complex technology innovation systems. She was one of the core team members to establish Scania Research and Innovation function in China, to explore and establish multi-dimensional cooperation projects between headquarters and China in the fields of new energy solutions and intelligent driving, smart production, and future transportation system transformation, and also delivered keynote speeches at relevant conferences. As the first and corresponding author, she published SCI, SSCI, and EI-indexed articles in transportation economics, business and management, sustainable development in innovative technology, smart manufacturing and new technology application of elderly care in Society.

- **Marilo Martin-Gasulla**, PTV Planung Transport Verkehr GmbH, marilomartingasulla@gmail.com, works as a Product Manager for Academia and Research at PTV Group where she creates learning programs for professors and students, helps to promote students in their fields to find their career path, and focuses on supporting institutions in their learning journey. Right before joining this software company, Marilo graduated from the University of Florida where she received her Ph.D. in Civil Engineering with a major in Traffic Engineering. She is a member of the
Transportation Research Board (TRB) Standing Committee on Roundabouts and other Intersection Design and Control Strategies where she also serves as the website manager, a member of the Institute of Transportation Engineers (ITE) Standing Committee on Roundabouts, and the co-chair of the TRB task force on Connected and Autonomous Vehicles and Roundabouts.

• Intended audience and expected attendance of the special session:
  
  o Researchers working on vehicle automation, vehicle cooperation, traffic management & control, traffic modeling and decision & control
  o Automotive engineers working on automated driving function development, automated vehicle testing and applications of vehicle automation & cooperation
  o Transportation engineers working on mixed traffic management & control and mixed traffic modeling & simulation
  o Other audience and attendance who are interested in the emerging technologies of vehicle automation & cooperation and transportation management

• Materials and equipment needed for the special session:
  
  o Equipment for presentations is needed as follows:  
    • Laptop or PC computer
    • Projector
    • Microphone
    • Audio

• Contact details of the proposers (email, postal address, etc):
  
  o Ziran Wang, ziran@purdue.edu
  o Jia Hu, hujia@tongji.edu.cn
  o Meng Wang, meng.wang@tu-dresden.de
  o Jiaming Wu, jiaming.wu@chalmers.se
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