Call for Workshop 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 workshops covering topics relevant to the field of intelligent transportation systems and its applications. Interested organizers are invited to submit their tutorial 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 proposal for a workshop should include title; contents of the workshop; a list of topics of interest; website; details of the organizers; a list of potential contributors with their affiliations, contact e-mails, and abstracts; information about the target audience and expected attendance; invited speakers; and materials needed to implement the workshop. Proposals must be submitted electronically by following the instructions available in the conference website (https://2023.ieee-itsc.org/). The deadline is March 1st, 2023.

Disclaimer 1: any workshop 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 proposal should describe how the workshop will be organized to encourage an active interaction between presenters and attendance.

Disclaimer 3: Attendance at workshops will be subject to an additional fee, in addition to the Conference registration fee. Thus, all workshop session participants (including organizers and presenters) will be required to pay a workshop attendance fee due to the venue hire cost and catering costs.

Disclaimer 4: unless otherwise imposed by organizational constraints, workshops will be held on September 24th, 2023.

Further enquiries can be forwarded to: contact@2023.ieee-itsc.org
Workshop Proposal

- **Title:**

  Data-driven and Empirical Research for Emerging Mixed Traffic (of Automated Vehicles and Human-driven Vehicles)

- **Contents:**

  - **Motivation and objectives.**
    Data-driven research is considered critical for understanding the dynamics of mixed traffic flow, interactive behaviors of Automated Vehicles (AVs) and human-driven vehicles (HDVs), as well as the impact of AVs on traffic safety and efficiency. Emerging datasets, especially real-world empirical data, allow researchers to investigate what could happen in the future mixed traffic. However, several challenges are still hampering data-driven research, e.g., the generalization capability problem of modeling, the unfamiliarity of the research community with advanced data processing and analysis tools, and the absence of collaboration between the research community and the Original Equipment Manufacturers (OEMs).

    To address these challenges, this workshop aims to push forward the data-driven and empirical research for the upcoming mixed traffic by:

    - Providing a unique opportunity for knowledge sharing by gathering together notable researchers in the domain and experts from the leading data collecting and vehicle automation companies.
    - Showcasing the emerging datasets, their formats, and structure, and discuss their limitations, and challenges for the current research.
    - Validating state-of-the-art modeling methods and assumptions, with mixed traffic flow datasets.
    - Identifying the current research gaps and future directions, as well as the opportunities for creating synergy between data-driven and theory-driven research.

    Participants of this workshop will have the opportunity to communicate with other dataset users face to face. The goals are share best practices, discuss common problems that have not been addressed, and gain insights on future research directions, so as to stay ahead of the curve. Additionally, a dataset list with detailed summaries together with tools and tips for analyzing the data will be shared with the participants after the workshop.

  - **Relevance to the ITS community.**
The scope and topics of this workshop align well with the interests of the ITS community, as well as the areas of interest for the 2023 IEEE ITSC. The topics that are covered by this workshop are highly correlated with the ITSC2023 Topics of Interest, e.g., Connected and automated vehicles, Naturalistic driving datasets and data analytics, Information systems and technologies, AI and deep learning for intelligent transportation systems, Sensors, detectors, and actuators in ITS, Security, privacy, and safety systems, Public policy, regulatory and societal issues in ITS.

- **Topics of interest.**
  Interested researchers are invited to submit their papers on the relevant research topics including but not limited to:
  1. State-of-the-art AV-related Datasets
  2. Data collection, processing, managing, and publishing
  3. Mixed traffic status prediction (long/medium/short term)
  4. Behavioral modeling and interaction in mixed traffic
  5. Role of artificial intelligence in data-driven research for mixed traffic
  6. Impact evaluation methods of mixed traffic
  7. Empirical evaluation of different vehicle automation levels
  8. Safety impacts of vehicle automation in mixed traffic
  9. Traffic flow impacts and string stability in mixed traffic
  10. Driving behavioral adaptation in mixed traffic
  11. Energy consumption/demand in mixed traffic
  12. Assumptions and simulation models for mixed traffic
  13. Policies, regulations, and codes of practice

- **Dedicated website.**
  [https://sites.google.com/view/itsc2023-mixed-traffic/home](https://sites.google.com/view/itsc2023-mixed-traffic/home)

- **Format: Full day/half day/other (provide details)**
  Full-day workshop.
  Involving keynote speaker sessions for the morning (4 speakers) and afternoon (3 speakers), a panel discussion, and a brainstorming session. Each speaking session would include a 20-minute presentation by the speaker, followed by a 10-minute Q&A session.
  There can also be paper presented in the form of posters/monitors in the workshop common areas.

**Agenda:**
- 09:00 – 09:10: [10 min] Opening: Workshop aim & agenda
- 09:10 – 09:30: [20 min] Ice breaker: Use Mentimeter to know participants
- 09:30 - 11:45: [135 min] Morning keynote speaks (Data and Methods)
  - 09:30 – 10:00: [30 min] Dr. Bruno Brito (Motional), topic tbd
  - 10:00 – 10:30: [30 min] Dr. Cathy Wu (MIT), Designing for scalable autonomy: If autonomous vehicles are the answer, what is the question?
  - 10:30 – 10:45: [30 min] Coffee Break
  - 10:45 – 11:15: [30 min] Dr. Maria Laura Delle Monache (UC Berkeley), Empirical experiment with 100 semi-automated vehicles to smooth traffic
  - 11:15 – 11:45: [30 min] Dr. Weizi Li (University of Memphis), Navigating Complex Intersections: Discovering Intelligence in Large-Scale Mixed Traffic Control
- 11:45 – 12:15: [30 min] Speed dating: Use the distributed colored sticky notes
- 12:15 - 13:30 [75 min] Break
➢ 13:30 – 15:00 [90 min] Afternoon keynote speaks (Impacts)

- 13:30 – 14:00: [30 min] Dr. Panagiotis Angeloudis (IC London), *The use of simulation for autonomous vehicle safety and validation*
- 14:00 – 14:30: [30 min] Dr. Michail Makridis (ETH Zurich), *(Partially-)Autonomous driving: Behavioral characteristics and implications on traffic flow*
- 14:30 – 15:00: [30 min] Dr. Selpi Selpi (CTH), *Impacts of vehicle automation in mixed traffic (tbd)*

➢ 15:00 – 15:20: [20 min] Coffee Break

➢ 15:20 – 16:05: [45 min] Panel discussion: Q & A for keynote speakers; Research needs and challenges in this domain

- Initial expectation vs. recent empirical findings on the impacts of automated vehicles
- Research needs and challenges, limitations of current datasets, and future research direction

➢ 16:05 – 16:50: [45 min] Brainstorm session

- Group discussions: Research needs, methods, terminology, etc. [45 min]
- Summary of the brainstorming session and the final survey

➢ 16:50 – 17:00: [10 min] Closing the workshop

- **Organizers (names, affiliations, emails, and short bio):**

  - **Yiyun Wang**, Corresponding organizer, Tongji university & Delft University of Technology (TU Delft), Y.Wang-31@tudelft.nl
  Yiyun Wang is currently a visiting Ph.D researcher at TU Delft, supervised by Dr. Haneen Farah and Prof. Bart van Arem. She received her B.S. degree in transportation engineering from the College of Transportation Engineering, Tongji University, where she is currently pursuing a Ph.D. degree. Her main research interests include traffic safety analysis and safety evaluation of connected and autonomous vehicles.

  - **Yongqi Dong**, Delft University of Technology (TU Delft), y.dong-4@tudelft.nl
  Yongqi Dong is currently a Ph.D. researcher at TU Delft, supervised by Dr. Haneen Farah and Prof. Bart van Arem. His research project is Data-Driven Research for Expanding Automated Vehicles Operational Design Domain in Mixed Traffic. He obtained his Master’s degree in Control Science and Engineering from Tsinghua University and Bachelor's degree in Telecommunication Engineering from Beijing Jiaotong University.

  - **Saeed Rahmani**, Delft University of Technology (TU Delft), s.rahmani@tudelft.nl
  Saeed Rahmani is a Ph.D. candidate in the department of Transport and Planning at TU Delft. During his M.S., he conducted research on traffic flow modeling in heterogeneous conditions and studied non-lane-based driving behavior. At TU Delft, his research is focused on developing motion prediction and planning algorithms for autonomous vehicles in complex urban areas.

  - **Irene Martínez**, Delft University of Technology, I.MartinezJosemaria@tudelft.nl
  Irene Martínez is an Assistant Professor in the department of Transport and Planning at the TU Delft and co-director of the hEAT lab focused on research on electric and automated transport. She received her Ph.D. in Civil and Environmental Engineering from the University of California, Irvine. Her research interests are traffic flow theory and control in the era of automated, connected, and shared mobility.
• Haneen Farah, Delft University of Technology (TU Delft), h.farah@tudelft.nl
Haneen Farah is an Associate Professor in the Department of Transport and Planning and a co-director of the Traffic and Transportation Safety Lab at TU Delft. She received her M.S. and Ph.D. in Transportation Engineering from the Technion- Israel Institute of Technology. Her research interests lie in the fields of road infrastructure design, road user behaviour, and traffic safety.

• Xin Pei, Tsinghua University (THU), peixin@mail.tsinghua.edu.cn
Xin Pei is currently a Research Associate Professor with the Department of Automation, Tsinghua University. She received her B.S. and M.S. degrees from Tsinghua University, in 2005 and 2007, respectively, and the Ph.D. degree from The University of Hong Kong in 2011. Her current research interests include road safety evaluation and driving behavior analysis.

• Shaocheng Jia, The University of Hong Kong (HKU), shaocjia@connect.hku.hk
Shaocheng Jia is currently a Ph.D. candidate at HKU. He received his B.S. degree from the Department of Electronic Information Engineering, China University of Petroleum (Beijing), and M.S. degree from the Department of Automation, Tsinghua University. His research interests include intelligent perception and control, connected and automated vehicles, traffic flow theory, and machine learning.

• Rongjie Yu, Tongji university, yurongjie@tongji.edu.cn
Rongjie Yu is a Professor in the College of Transportation Engineering, Tongji University. He received the B.S. degree from Tongji University in 2010 and the M.S. and Ph.D. degrees in traffic engineering from the University of Central Florida in 2012 and 2013, respectively. His research interests include traffic safety, human behavior, and safety evaluation of connected and autonomous vehicles.

• Meixin Zhu, Hong Kong University of Science and Technology (HKUST) (Guangzhou), meixin@ust.hk
Meixin Zhu is a tenure-track Assistant Professor at HKUST (Guangzhou). He obtained a Ph.D. degree in intelligent transportation at the University of Washington (UW), and received his B.S. and M.S. degrees in traffic engineering from Tongji University. His research interests include Autonomous Driving Decision Making and Planning, Driving Behavior Modeling, Traffic-Flow Modeling and Simulation.

• Raphael Stern, University of Minnesota, rstern@umn.edu
Raphael Stern is an assistant professor in the Department of Civil, Environmental, and Geo- Engineering at the University of Minnesota. He received his B.S., M.S., and Ph.D. in civil engineering from the University of Illinois. His research interests are in the area of modeling and control of mixed autonomy traffic flow.

• Potential contributors to the workshop (names, affiliations, contact information, abstracts (if available):
The organizers will use their professional network to attract paper submissions, and will also promote the workshop to dedicated groups both in academia and in industry, inviting researchers to submit or present their latest work. Besides, organizers themselves will present cutting-edge research from their group during the workshop.
• Intended audience and expected attendance for the workshop (including a clear statement how interaction between presenters and attendance will be fostered):

This workshop is about an emerging and challenging topic, which is important for the deployment of AVs. Some research groups in top universities are delving into this domain. The format of this workshop will promote the interactions and communications between presenters and other attendees. In the morning, there will be a speed-dating organized, participants match according to the colored sticky notes distributed randomly beforehand. In the afternoon, the audience will be encouraged to ask questions to the keynote speakers during the panel discussion. Then, in the Brainstorm session, presenters and attendees have the opportunity to discuss research questions and methodologies in-depth. Besides, participants can discuss with each other during the coffee break time, and before or after the workshop schedule.

• Invited speakers (if any):
  Confirmed speakers:
  • **Dr. Maria Laura Delle Monache**, Assistant professor in the Department of Civil and Environmental Engineering and the Institute of Transportation Studies at the University of California, Berkeley. (Presentation title: Tentative presentation topic: Empirical experiment with 100 semi-automated vehicles to smooth traffic)
  • **Dr. Cathy Wu**, Assistant Professor at Civil and Environmental Engineering, Massachusetts Institute of Technology. (Presentation title: Designing for scalable autonomy: If autonomous vehicles are the answer, what is the question?)
  • **Dr. Panagiotis Angeloudis**, Reader and Head of the Transport Systems and Logistics Laboratory at Imperial College London. (Presentation title: The use of simulation for autonomous vehicle safety and validation)
  • **Dr. Weizi Li**, Assistant Professor of Computer Science at the University of Memphis, Director of the STARS lab. (Presentation title: Navigating Complex Intersections: Discovering Intelligence in Large-Scale Mixed Traffic Control)
  • **Dr. Michail Makridis**, Senior Researcher at Institute for Transport Planning and Systems, ETH, Zürich; first author of TR_C_Open_ACC paper. (Presentation title: (partially-)Autonomous driving: Behavioral characteristics and implications on traffic flow)
  • **Dr. Selpi Selpi**, Researcher at Data Science and AI, Chalmers University of Technology. (Research interests: Impacts of vehicle automation in mixed traffic)
  • **Dr. Bruno Brito**, Senior Research Scientist and Team Leader, Motional Inc. (Research subject: Motion Planning Research)

  Other potential speakers:
  • **Prof. Xiaobo Qu**, Fellow of the European Academy of Sciences, Chair Professor of Intelligent Transportation, Tsinghua University, China.
  • **Dr. Danjue Chen**, Associate Professor in the Dept. of Civil and Environmental Engineering at the University of Massachusetts Lowell. (Research interests: Connected, autonomous vehicles).
  • **Dr. Xinwei Wang**, Lecturer (Assistant Professor) at Queen Mary University of London.

• Materials and equipment needed for the workshop:
Depending on how the poster session is arranged, this workshop requires a few posters stands or monitors to demonstrate selected accepted papers by posters.

- **Contact details of the proposers (email, postal address, etc):**
  - Yiyun Wang, Y.Wang-31@tudelft.nl, 2628CN, Delft, Zuid Nederland
  - Yongqi Dong, y.dong-4@tudelft.nl, 2628CN, Delft, Zuid Nederland
  - Irene Martínez, I.MartinezJosemaria@tudelft.nl, Stevinweg 1, 2628 CN Delft, The Netherlands