

Special Session Proposal

- Title:

Enabling the Future of Air Traffic Management: A Perspective from AI technology and Advanced Control and Optimization

- Modality:

- Half-day (e.g., 3 hours plus breaks)

- Scope (no longer than 4 pages), including the following sections:

The air traffic management (ATM) industry is facing significant challenges as air traffic continues to grow and becomes increasingly complex. To address these challenges, new technologies and approaches are being developed to improve the efficiency, safety, and sustainability of air travel. This special session aims to bring together experts from academia, industry, and government to discuss the latest developments in next-generation air traffic management systems.

The special session will consist of several presentations and discussions on the following topics:

1. Emerging technologies for air traffic management: This section will focus on cutting-edge technologies such as artificial intelligence, machine learning, and blockchain that are being developed to improve air traffic management.
2. The role of automation in air traffic management: Automation is playing an increasingly important role in air traffic management. This section will examine the current state of automation in the ATM industry and discuss the challenges and opportunities it presents.
3. Collaborative Decision Making in air traffic management: Collaborative Decision Making (CDM) is an approach to air traffic management that emphasizes communication and coordination among all stakeholders. This section will explore the benefits of CDM and its impact on air traffic management.
4. 4D trajectory in air traffic management: 4DT-related technologies can enhance the granularity and efficiency of air traffic management and related analysis. The exploration and implementation of 4DT will be discussed in this session.
5. The future of air traffic management: The final section will be a panel discussion on the future of air traffic management. This will include a discussion of the opportunities and challenges that lie ahead and how next-generation air traffic management systems will help to shape the future of air travel.

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

1. Dr. Yicheng Zhang

- Affiliation: Institute for Infocomm Research, Agency for Science, Technology and Research, Singapore
- Email: zhang_yicheng@i2r.a-star.edu.sg
- Bio: Yicheng Zhang received the PhD degree in Electrical and Electronic Engineering from Nanyang Technological University, Singapore in 2019. He is currently a principal investigator and research scientist at the Institute for Infocomm Research (I2R) in the Agency for Science, Technology and Research, Singapore (A*STAR). Before joining I2R, he was a research associate affiliated with Rolls-Royce @ NTU Corp Lab. He has participated in many industrial and research projects funded by National Research Foundation, A*STAR, Land Transportation Authority, and Civil Aviation Authority of Singapore. He published more than 80 research papers in journals and peer-reviewed conferences. He received the IEEE Intelligent Transportation Systems Society (ITSS) Young Professionals Traveling Scholarship in 2019 during IEEE ITSC, and as a team member, received Singapore Public Sector Transformation Award in 2020.

2. Dr. Sheng Zhang

- Affiliation: Institute for Infocomm Research, Agency for Science, Technology and Research, Singapore
- Email: zhang_sheng@i2r.a-star.edu.sg
- Bio: Dr Sheng Zhang received the Bachelor degree from the Huazhong University of Science and Technology, China, in 2015, and the Ph.D. degree in Electrical and Electronic Engineering from Nanyang Technology University (NTU), Singapore, in 2020. In 2021, he was a Research Fellow at NTU, researching high accuracy and dynamic AGV parking/docking systems. He is currently a Scientist with the Institute for Infocomm Research (I2R), a research entity of the Agency for Science, Technology and Research (A*STAR), Singapore. His research interests cover air-traffic management, trajectory-based operations, high accuracy positioning, point cloud processing, sensor fusion, machine learning, target detection, signal processing, and data fusion.

3. Dr. Yi Zhang

- Affiliation: Institute for Infocomm Research, Agency for Science, Technology and Research, Singapore
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- Bio: Yi Zhang received her Bachelor degree of Engineering from Shandong University, China in 2014, and the PhD degree in Electrical and Electronic Engineering from Nanyang Technological University, Singapore in 2020. She is currently a research scientist at the Institute for Infocomm Research (I2R) in the Agency for Science, Technology and Research, Singapore (A*STAR). Her research interests focus on intelligent transportation systems, including urban traffic flow management, model-based traffic signal scheduling, lane change prediction and bus dispatching and operation management.

4. Dr. Liping Huang

- Affiliation: Institute for Infocomm Research, Agency for Science, Technology and Research, Singapore

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 - Bio: Liping Huang received her PhD degree in the college of computer science and technology from Jilin University in Dec 2018. She has worked as a research fellow at Nanyang Technological University, Singapore since Jun 2019. In Jan 2023, she joined the Institute for Infocomm Research (I2R) in the Agency for Science, Technology and Research, Singapore (A*STAR), working as a research scientist. Her research interests focus on data mining and machine learning techniques in intelligent transportation, including trajectory data mining, spatial-temporal data modelling, urban traffic prediction, and air traffic data processing.
5. Mr. Ruikang Luo
- Affiliation: Continental-NTU Corporate Lab, School of Electrical and Electronic Engineering, Nanyang Technological University, 50 Nanyang Avenue, 639798
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 - Bio: Ruikang Luo received the B.E. degree from the School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore. He is currently pursuing the Ph.D. degree with the School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore. He is a research engineer affiliated with Continental-NTU Corporate Lab. He has participated in many industrial and research projects funded by National Research Foundation, A*STAR, Land Transportation Authority. His research interests include spatiotemporal traffic parameter forecasting, adaptive traffic control, vehicle dispatching and vehicle recognition. He published more than 20 research papers in journals and peer-reviewed conferences and has several patents application under review.
6. Mr. Nanbin Zhao
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 - Bio: Nanbin Zhao received the Bachelor's Degree of Engineering from University of Electronic Science and Technology of China in 2019 and the Master's Degree of Science from the National University of Singapore in 2020. He is currently pursuing the Ph.D. degree at the School of Electrical and Electronic Engineering, Nanyang Technological University. His research interests include intelligent transportation systems, vehicle control, machine learning, and IOT.
7. Mr. Han Zhao
- Affiliation: School of Electrical and Electronic Engineering, Nanyang Technological University, 50 Nanyang Avenue, 639798
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 - Bio: Han Zhao received the Bachelor degree in Electrical and Electronic Engineering from Nanyang Technological University, Singapore in 2018. He is currently working toward the Ph.D degree in Electrical and Electronic Engineering in Nanyang Technological University, Singapore. His research interests include intelligent transportation system (ITS), short-term traffic flow prediction and graph neural networks.
8. Mr. Yaofeng Song
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- Bio: Yaofeng Song received the bachelor degree from the school of Automation Science and Engineering in South China University of Technology. He is currently pursuing the Ph.D. degree at the School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore. His research interests involve deep learning-based traffic forecasting.
- Intended audience and expected attendance of the special session:

This special session aims to bring together experts from academia, industry, and government to discuss the latest developments in next-generation air traffic management systems. Attendees of this special session will have the opportunity to:

1. Learn about the latest developments in next-generation air traffic management systems from leading experts in the field.
 2. Gain insight into the future of air traffic management and the role of emerging technologies such as AI and blockchain.
 3. Network with other experts in the air traffic management industry and explore potential collaboration opportunities.
- Materials and equipment needed for the special session:

Nil

- Contact details of the proposers (email, postal address, etc):

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