

IEEE Technical Committee on Automotive Controls

The IEEE Technical Committee on Automotive Controls (TC-AC) brings together academic researchers and industry practitioners who address control challenges in automotive applications, including, among others, vehicle dynamics, connected and automated vehicles, intelligent transportation systems, energy storage systems, (electrified) powertrains, and smart mobility systems. The TC serves its members by coordinating invited sessions at conferences and special issues in journals, and by disseminating information between industry and academia, such as job postings and calls for funding proposals. Meetings of the TC are organized twice annually: at the American Control Conference (ACC) and the IEEE Conference on Decision and Control (CDC).

LEGACY AND MISSION

The TC started thanks to the initial efforts of Prof. Luigi Glielmo of the University of Sannio at Salerno, Italy, and Prof. Jessy W. Grizzle of the University of Michigan, USA. Initially, the committee was named the “Technical Activity Board on Automotive Control.”

After its formal approval by the IEEE Control Systems Society (CSS) in 1999, the name was changed to the TC-AC. Today, the TC-AC has more than 150 members, with approximately 70% from academia and 30% from industry. Benefiting from both academic and industrial participation, the committee coordinates activities toward improving the understanding of challenges, problems, and effective methods of controlling automotive systems.

*Digital Object Identifier 10.1109/MCS.2024.3382371
Date of current version: 24 May 2024*

Today, the TC-AC has more than 150 members, with approximately 70% from academia and 30% from industry.

The TC provides the gathering point for running technical meetings and organizing invited sessions and workshops at major conferences. Through meetings and discussions during invited sessions, the TC-AC brings together control engineers, researchers, and practitioners to identify current trends and future directions of automotive control research and development in many areas.

ORGANIZATION

In January 2024, the role as TC chair was passed on to me, Alexander Katriniok, assistant professor at Eindhoven University of Technology, The Netherlands, and research engineer at the Ford Research & Innovation Center, Aachen, Germany. As incoming chair, I would like to express my deepest gratitude and appreciation to the previous chair, Prof. Mara Tanelli of Politecnico di Milano, Italy, for her active service, enthusiasm, and dedication. I am really looking forward working closely with the committee members, partnering TCs, and the community on a very relevant and exciting field of application.

Recognizing how much automotive control applications have broadened in recent years, the TC is organized in six working groups (WGs), which are chaired by TC members:

» WG 1: Vehicle dynamics, simulation and control; chaired by

Dr. Son Tong, R&D Advanced Driver Assistance Systems Manager at Siemens Digital Industries Software, Belgium.

- » WG 2: Autonomous, connected, and coordinated vehicles; led by Paolo Falcone, associate professor at Chalmers University of Technology, Sweden and at the University of Modena e Reggio Emilia, Italy.
- » WG 3: Intelligent vehicles and transportation systems; managed by Sean Brennan, professor at Pennsylvania State University, USA.
- » WG 4: Electric/hybrid (and alternative propulsion) vehicles: powertrain and motion control, optimization, and energy management; supervised by Dr. Yan Wang, Nikola Corporation, USA.
- » WG 5: Smart and soft last mile mobility: vehicles, optimization and planning; chaired by Yuri Vershinin, assistant professor at Coventry University, U.K.
- » WG 6: Big data and learning for automotive control and ground mobility systems; supervised by Javad M. Velni, professor at Clemson University, USA.

This way, the TC is able to better focus on its activities and plan dedicated actions. It is envisioned to be more present in the community and to recognize

the value of multidisciplinary activities by creating stronger liaisons with other TCs that are close to the TC-AC and its research directions.

ACTIVITIES

The IEEE TC-AC has a long-lasting partnership with the American Society of Mechanical Engineers (ASME) Energy Systems TC (ESTC) and Automotive Transportation Systems TC to organize invited sessions at the ACC. This partnership has broadened the scope of the automotive invited sessions, allowing us to represent the interdisciplinary challenges associated with the development of electrified powertrains and (highly) automated vehicles.

In 2023, the TC-AC organized invited sessions jointly with the IFAC TC on Automotive Control at the European Control Conference. At the upcoming ACC 2024, invited sessions have jointly been established with the ESTC of the ASME Dynamic Systems and Control Division, and the IEEE TC on Smart Cities.

Moreover, in 2023 the special issue of the *IEEE Transactions on Control Systems Technology* on “Intelligent Decision-Making, Motion Planning, and Control of Automated Vehicles in Interaction-Driven Traffic Scenarios” has jointly been organized by Emilia Silvas, assistant professor at Eindhoven University of Technology and senior scientist at The Netherlands Organization for Applied Scientific Research, and myself. The special issue is expected to be published by end of 2024.

In the near future, the TC-AC intends to initiate a webinar series on automotive controls by inviting speakers from industry and academia. The webinar series is supposed to be open to everyone.

MEMBER ACHIEVEMENTS AND AWARDS

Several TC members have recently reached important achievements, which I am glad to share with the CSS community.

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Antonella Ferrara, professor at the University of Pavia, Italy, has received the IFAC Fellow Award (period 2020–2023) at the IFAC World Congress 2023 in Yokohama, Japan, for outstanding and extraordinary contributions to sliding mode control theory and applications.

Dr. Mrdjan Jankovic, staff engineer for sustainable energy and mobility at the Southwest Research Institute, USA, has been awarded the Nathaniel B. Nichols Medal at the IFAC World Congress 2023 in Yokohama, Japan, for innovative fundamental contributions to the control of automotive systems.

Jessy W. Grizzle, professor at the University Michigan, USA, has received the Rudolf Kalman Best Paper Award from the ASME Dynamic Systems and Control Division, jointly with Dr. Yukai Gong, at the Modeling, Estimation, and Control Conference 2023.

Yuri Vershinin, assistant professor at Coventry University, U.K., has been recognized by the IEEE for volunteering as proctor to guide and oversee competing teams for the “IEEEExtreme 16.0 programming competition,” which hosted more than 14,600 participants in October 2022.

Finally, Dr. Bryan Maldonado Puente, R&D associate staff at Oak Ridge National Laboratory, USA, has received the 2023 Early Career Research Accomplishment Award (UT-Battelle), the 2023 Most Promising Scientist–Ph.D. in National Laboratories, Great Minds in STEM Award (University

of Southern California and California State Los Angeles), and has been selected for the 2023 Cradle to Commerce Cohort (Lawrence Berkeley National Laboratory) to partner with entrepreneurs and accelerate the commercialization of intellectual property developed by national laboratories.

HOW TO BECOME A MEMBER?

The TC is open and happy to welcome new members who are interested and willing to participate in the organizational activities, and who share the same passion for automotive controls. Any CSS member can join the TC-AC, and student members are highly welcome. To this end, please send an e-mail with your affiliation information to Alexander Katriniok (a.katriniok@tue.nl). You will then be added to the TC-AC e-mail list, which is used by the committee to distribute information about events, meetings, call for papers, and job openings in industry and academia. Also, nonmembers can benefit from participating in the activities organized by TC-AC, such as invited sessions and workshops. The latest information about the TC-AC can be found at <http://ieeecss.org/technical-committee/automotive-controls>. We also have a LinkedIn group (“IEEE CSS Technical Committee on Automotive Controls”) for sharing calls for papers, targeted job postings, and announcements.

Alexander Katriniok 
TC Chair