



Brendan Morris , Editor

IEEE ITSC 2022

EDITOR'S NOTE

If you are organizing an intelligent systems-related event in your part of the world and wish to communicate news about your event in *IEEE Intelligent Transportation Systems Magazine*, please contact Brendan Morris, Intelligent Transportation Systems Society vice president, Conference Activities, via brendan.morris@univ.edu.

The 25th IEEE International Conference on Intelligent Transportation Systems (ITSC 2022) was successfully held in a distributed/decentralized hybrid format from 18 September to 12 October 2022. It started in Beijing and concluded in Macau, a Special Administrative Region of the People's Republic of China. Macau is also a member of the UNESCO Creative Cities of Gastronomy, where Eastern and Western cultures coexist in harmony. The logo of ITSC 2022 is shown in Figure 1.

The conference received more than 1,260 submissions from researchers, engineers, and practitioners across 41 countries. A total of 1,256 papers were reviewed, and each paper received 2.73 reviews on average. A total of 636

papers from 34 countries were accepted and registered. The statistics of the submission and acceptance at ITSC 2022 is shown in Figure 2. In addition, 30 papers from six workshops were included in the conference program. During this unusual pandemic time, an innovative distributed/decentralized hybrid conference format was developed and deployed with on-line live broadcasting, supported by Qingdao Television, Inc. With its extraordinary computing and networking technologies, over 200 scholars together hosted 145 sessions/workshops and connected with more than 2,000 presenters from 25 countries to share their cutting-edge findings, research, perspectives, and developments related to advanced intelligent transportation systems (ITS). The broadcasting on the website received more than 96,000 visits from people all over the world. The conference truly bridges the digital and physical world in closed-loop

interactions, which opens a fresh outlook on the history of ITSC.

To provide diverse and featured services to the attendees of the 25th ITSC, the General Secretary's office, led by Prof. Xiao Wang from Anhui University, China, and members from Chinese Association of Automation (CAA), Qingdao Academy of Intelligent Industries (QAII), Chinese Academy of Sciences, Macau University of Science and Technology (MUST), Beijing Jiaotong University, Xi'an Jiaotong University, and Anhui University, thoroughly investigated the history of ITSC and its footprint, as shown in Figure 3. It began in Boston, MA, USA in 1997. As one of the annual flagship conferences sponsored by the IEEE Intelligent Transportation Systems Society (ITSS), ITSC is now a world-famous and can-not-miss event for researchers, practitioners, and scholars in the ITS field worldwide. After 25 years of development, the conference has been held in 24 cities across 12 countries. The ITSC 2022 in Macau is the fourth time that the conference has been hosted in China.

The general chair, Prof. Joseph Hun-wei Lee, the program chair, Prof. Fei-Yue Wang, along with all of the organizing committee members and the international program committee members, put in a lot of effort to make ITSC 2022 successful and pleasant. Wang started to organize the program committee



IEEE ITSC 2022

FIG 1 The logo of ITSC 2022.

soon after CAA and MUST won the host right of ITSC 2022 and looked for the most capable conference service providers available. Since it is the first time that ITSC was held in Macau, he planned to give ITSS members a unique opportunity to exchange and celebrate their works, but soon the COVID-19 pandemic began to sweep the world, which made it a big challenge to host a conference on such a large scale. The time schedule of ITSC 2022 is shown in Figure 4.

Considering the changing situations during the pandemic, Wang started to think about how to utilize his previous research on social computing and cyber movement organizations to connect people in the ITS field worldwide through virtual–real interactive ways in an online–offline closed loop. Such an idea drove him to build the most appropriate organizing committee for a conference in the distributed/decentralized hybrid format. In his perspective, the attendees of ITSC 2022 would be distributed into different online communities, then each online community would become a decentralized autonomous organization (DAO) [1],

[2]. The DAO has already changed the way people contribute information and knowledge [3]. On that basis, the key points become researching or creating more capable computational infrastructures to support the collaborative work among organizers, hosts, speakers, and viewers.

Following Wang’s thoughts in “Social Computing: From Social Informatics to Social Intelligence” [4], “Toward a Paradigm Shift in Social Computing: The ACP Approach” [5] in 2007, and “Social Computing: From Crowdsourcing to Crowd Intelligence by Cyber Movement Organizations” [6] in 2019, the General Secretary’s office identified the key and underpinning technologies to fulfill his vision for ITSC 2022, including data mining, information retrieval and processing, automated targeted distributing, knowledge automation, real-time broadcasting and statistics, and online–offline interaction. Therefore, the distributed and decentralized, artificial–actual and online–offline interactive and hybrid organizing process of ITSC 2022 was built.

A metaverse [7] center, as shown in Figure 5, was built in QAIL, which pro-

vides online live broadcasting, data statistics analysis, and network quality monitoring services for this 22-day worldwide academic festival. During the 22-day conference, more than 2,000 authors and 96,000 audiences were united by ITSC 2022, covering almost all frontier research and hot topics in the field of ITS. Figure 6 shows the daily visit statistics from 18 September to 11 October.

It is the first time that so many cutting-edge technologies have been utilized in organizing an international conference. We believe that such an organizational format would benefit more scholars to communicate and collaborate in much more effective and efficient ways. With the theme of “Blockchain-Based ITS: The Human Use of Cyber-Physical-Social Transportation Systems,” the main conference of ITSC 2022 connected the researchers and practitioners to provide safe, secure, smart, sustainable, and sensitive ITS services for cross-border logistics.

The Plenary lectures were delivered by four world-class researchers. They addressed the following topics:

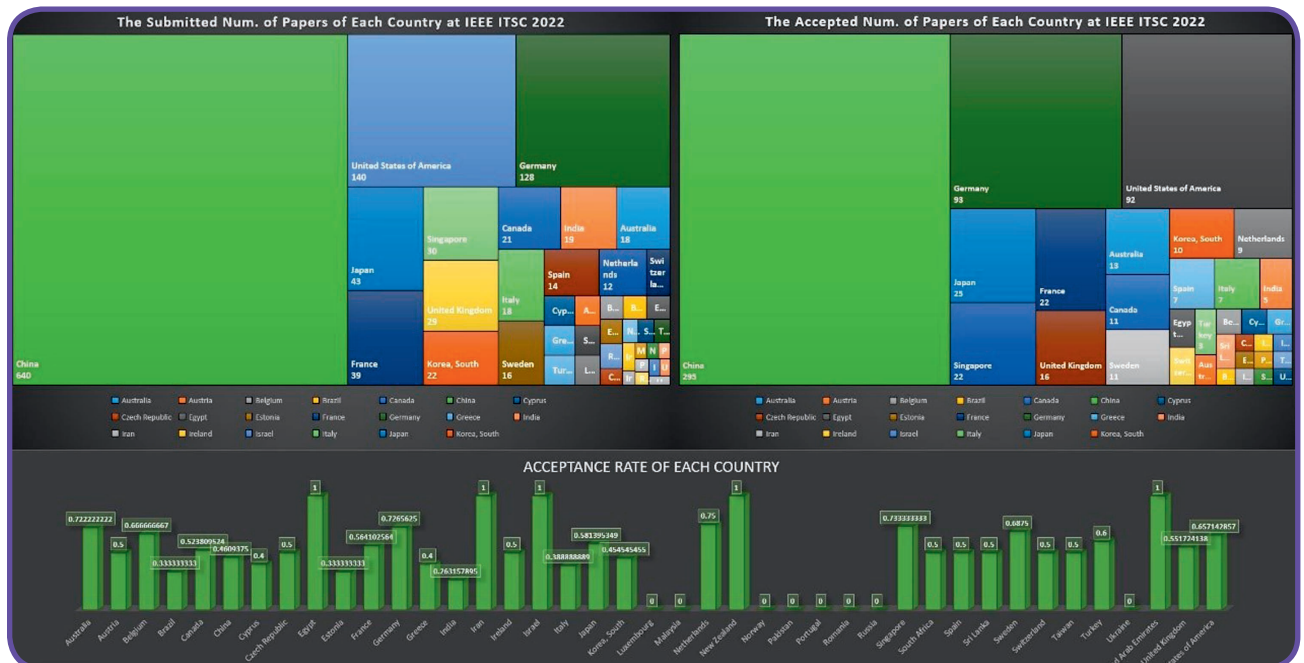


FIG 2 Statistics of paper submission and acceptance at ITSC 2022.

- “Key Technologies of Intelligent Inland Vessels and Parallel Intelligent Systems” by Xinping Yan from Wuhan University, China
- “Using Artificial Intelligence Techniques to Improve the Efficiency of Transportation Systems” by Arlindo Oliveira from Instituto Superior Tecnico, Portugal
- “The Future of HGVs: Electric or Hydrogen?” by David Cebon from the University of Cambridge, England
- “Traffic Flow Modelling Control and Optimization” by Petros Ioannou from the University of Southern California, USA.

ITSC 2022 also hosted the Awards Ceremony for the best conference papers at ITSC 2022 and the annual awards

of ITSS. Authors and researchers with outstanding contributions received their awards. They are as follows.

For Best Paper Award:

- The 1st Best Paper Award: “Interpretable Machine Learning Models for Modal Split Prediction in Transportation Systems”
- The 2nd Best Paper Award: “Interaction-Aware Game-Theoretic Motion Planning for Automated Vehicles Using Bi-Level Optimization”
- The 3rd Best Paper Award: “Efficient Calibration of Agent-based Traffic Simulation Using Variational Auto-Encoder.”

For Best Application Award

- The 1st Best Application Award: “ACP based Large-Scale Coordinat-

ed Route Planning From Perspective of Cyber-Physical-Social Systems”

- The 2nd Best Application Award: “Terrain Mapping for Autonomous Trucks in Surface Mine”
 - The 3rd Best Application Award: “Dynamic Provisioning of Airport Resources for Inbound Passenger Flow Using Reinforcement Learning.”
- For Best Student Paper Award:
- The 1st Best Student Paper Award: “Learning Transformer-Based Cooperation for Networked Traffic Signal Control”
 - The 2nd Best Student Paper Award: “Driving Safety Monitoring and Warning for Connected and Automated Vehicles Via Edge Computing”

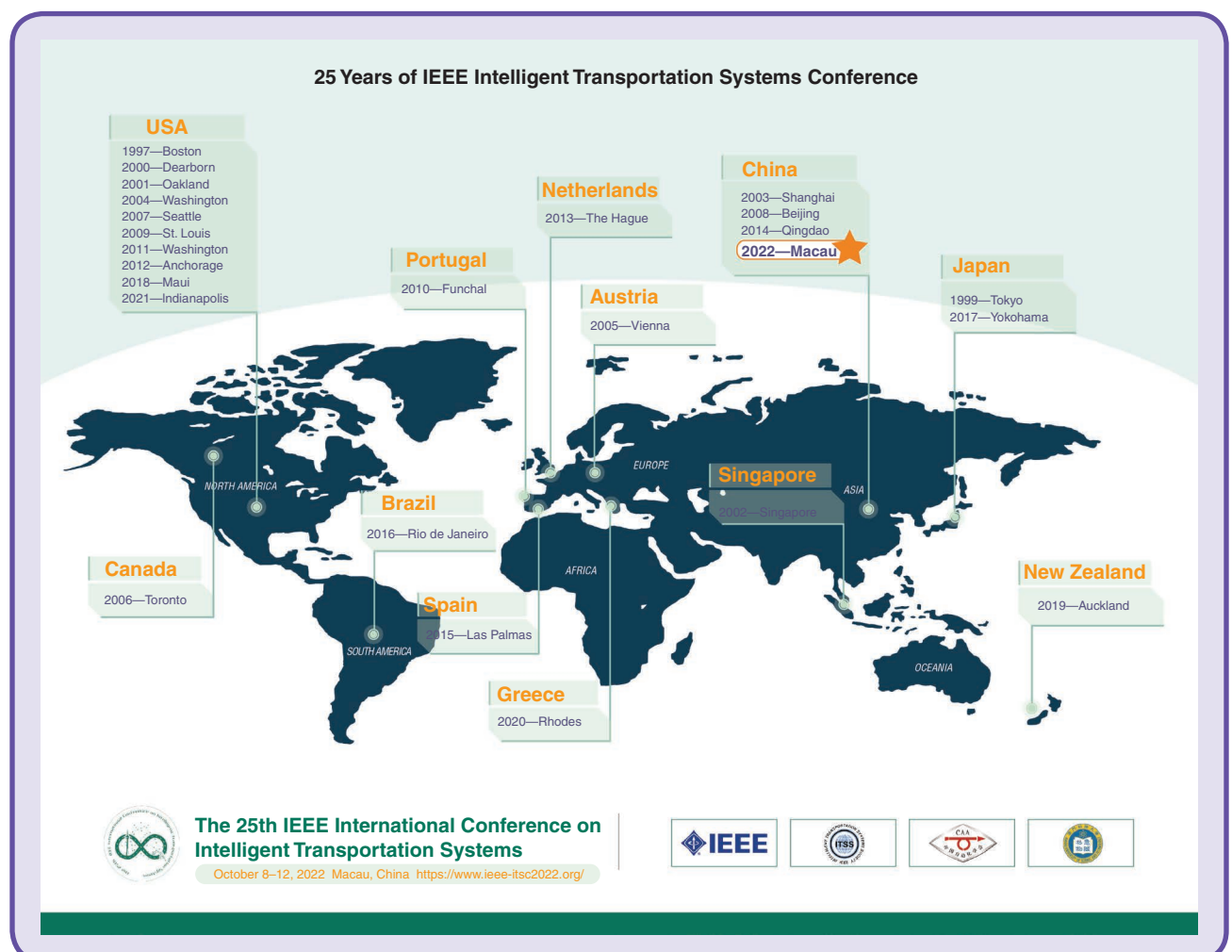


FIG 3 The footprint of ITSCs.

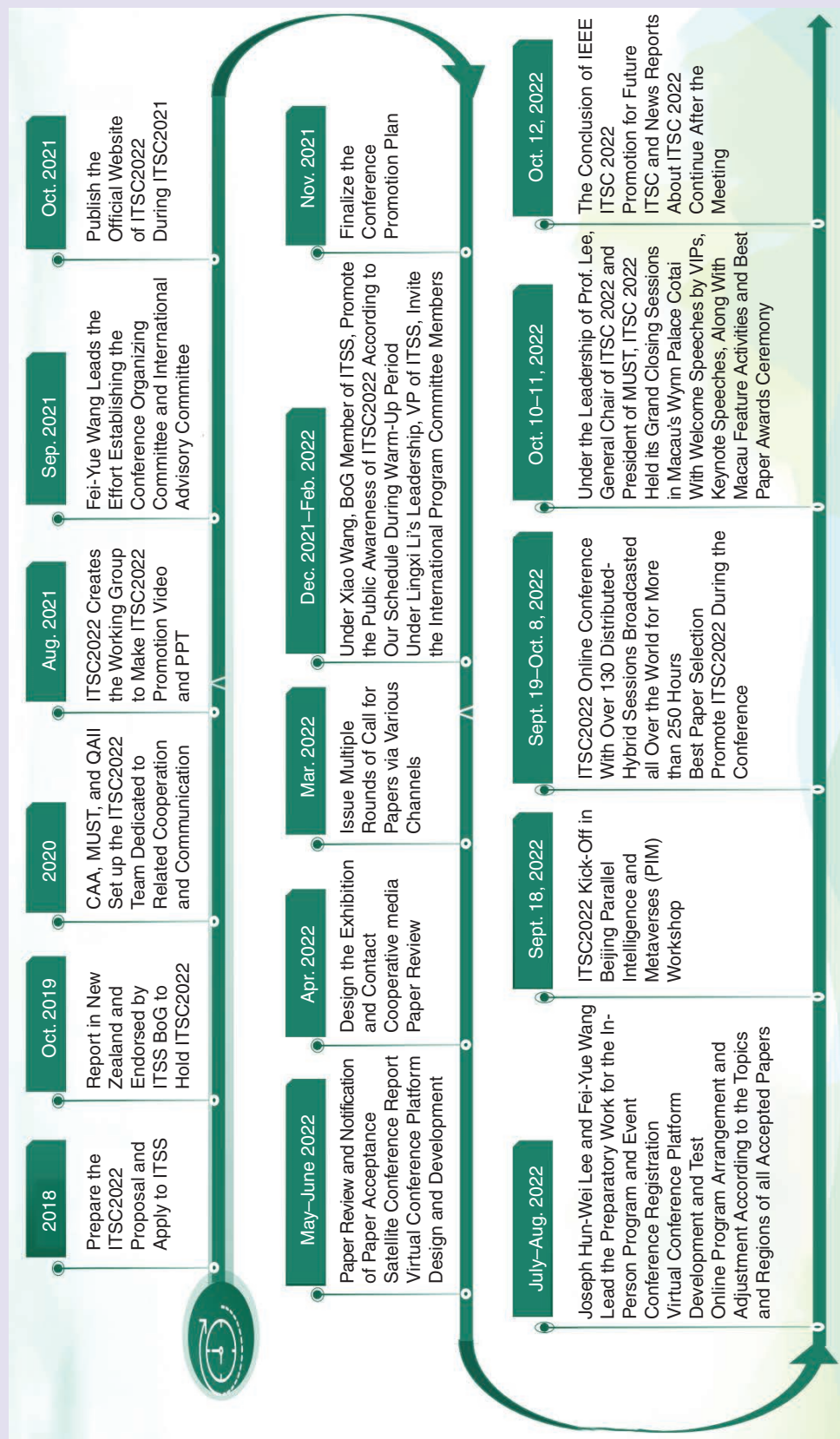


FIG 4 The time schedule of ITSC 2022.

- The 3rd Best Student Paper Award “SINA: A Drone Dataset at Signalized Intersection in China.”

As organized in a distributed hybrid conference, ITSC 2022 divided all papers into 80 groups and included them in different sessions. All presenters were required to record a video and share their videos online. To motivate authors to record and share videos, the award committee also decided to set the Best Presentation Awards for general sessions, special sessions, and workshops, respectively. The list of award winners is summarized as follows.

For Best Presentation Award in General Sessions:

- The 1st Best Presentation Award in General Sessions: “Lane Change Decision-Making With Active Interactions in Dense Highway Traffic: A Bayesian Game Approach”
- The 2nd Best Presentation Award in General Sessions: “Uncertainty-Aware Online Merge Planning With Learned Driver Behavior”
- The 3rd Best Presentation Award in General Sessions: “Spatial-Tem-

poral Analysis of Road Raveling and Its Correlation with Traffic Flow Characteristics.”

For Best Presentation Award in Special Sessions:

- The 1st Best Presentation Award in Special Sessions: “A Two-Stage Stochastic Programming Approach for Timetable Rescheduling With Reassignment of Rolling Stock Under Uncertain Disruptions”
- The 2nd Best Presentation Award in Special Sessions: “Sliding Mode Acceleration Estimation for Safe Vehicular Cooperative Adaptive Cruise Control”
- The 3rd Best Presentation Award in Special Sessions: “Safe Decision-Making for Lane-Change of Autonomous Vehicles Via Human Demonstration-Aided Reinforcement Learning.”

For Best Presentation Award in Workshops:

- The 1st Best Presentation Award in Workshops: “Turn-Level Network Traffic Bottleneck Identification and Hierarchical Control Using Vehicle Trajectory Data”

- The 2nd Best Presentation Award in Workshops: “Decision Model for Pedestrians Interacting With the Traffic Flow at Uncontrolled Intersections”

- The 3rd Best Presentation Award in Workshops: “CitySim: A Drone-Based Vehicle Trajectory Dataset for Safety Oriented Research and Digital Twins.”

The Young-Professionals Social Event was organized online with the aim of providing young researchers and students with the channels to expand their social networks and inspire them to participate in more ITSS-sponsored conferences/events.

ITSC 2022’s opening ceremony, banquet, workshops, plenary lectures, and all technical sessions have effectively and efficiently attracted and connected researchers, scientists, engineers, and industry professionals to participate in this event and experience Macau’s distinctive culture. ITSC 2022 not only served as a catalyst for knowledge dissemination but also facilitated networking and collaboration, strengthening the



FIG 5 A screenshot of the QAI Metaverse Quality and Service System.

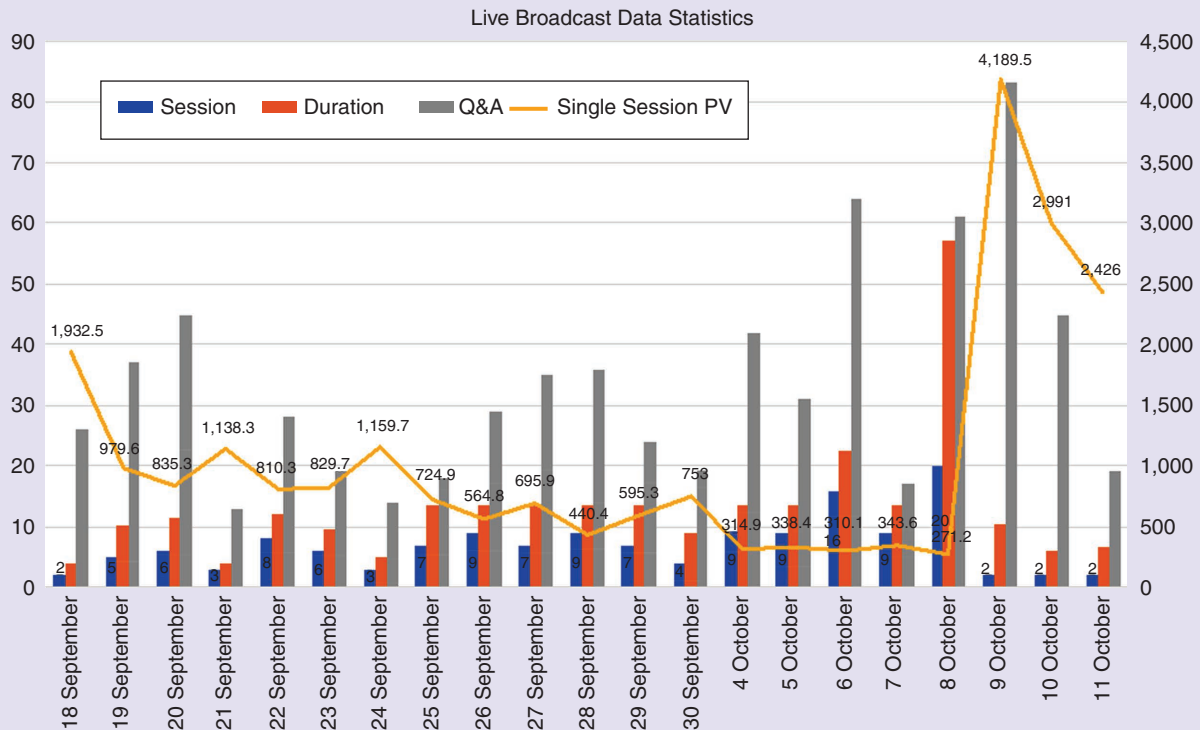


FIG 6 The live broadcast data statistics from 18 September to 11 October.

global community of technology enthusiasts and paving the way for further advancements in the ITS field.

Visit the conference website for more information: <https://www.ieee-itsc2022.org/#/>. Conference playback can be found at: <https://www.ieee-itsc2022.org/#/attend/sessionlist>.

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