Special Session Proposal

• Title: Autonomous driving Map and Positioning Technology

• Modality:
  o Half-day (e.g., 3 hours plus breaks)

[TO BE COMPLETED BY THE PROPOSERS]

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

  As an important technology to improve traffic safety and transportation efficiency, Intelligent connected vehicle (ICV) has become the focus of attention in the global vehicle and transportation field and is the core trend of future transportation development. As an important basic data and technology support for the development of high-level autonomous driving, high-definition map and positioning play an important role in high-precision positioning, intelligent perception, decision-making, and navigation et al.

  Autonomous driving High-definition maps (HD Map) provide accurate and reliable driving environment information for vehicles and are an indispensable data foundation and technical support for breaking through the bottleneck of high-level autonomous driving. If the map is not updated in time, it will directly cause the wrong judgment of the automotive driving system, resulting in major safety hazards and traffic accidents. The dynamic update of high-precision maps has become a key technical bottleneck restricting the breakthrough and popularization of unmanned driving technology.

  Autonomous driving dynamic maps still face many challenges, such as insufficient multi-scenario general perception, insufficient positioning, insufficient 3D reconstruction, insufficient high-confidence map updating, etc. To deal with these challenges, relevant research has been carried out at home and abroad, but many problems still need to be solved urgently. At present, traditional map update methods are no longer adequate, and it is urgent to find new theories and methods. This special issue aims to provide a platform for researchers and engineers from...
academia, industry, and policymaker to present their latest research findings and engineering experiences in developing and applying novel technologies to improve the update of autonomous driving dynamic maps and the safety of automotive driving. We are soliciting original high-quality research papers on specific topics that include, but are not limited to, the following:

➢ High-definition Map Mapping Algorithm
➢ Map Dynamic Update Based on Blockchain and AI
➢ Environment Perception and Cognition Algorithm
➢ Multi-source Heterogeneous Perception Fusion
➢ High Precision Vehicle Localization technology
➢ Target Detection and tracking technology
➢ Pedestrian Recognition and Behavior Prediction
➢ Consensus Decision Model for Crowdsourced Data
➢ Map high-confidence Updates of Crowdsourced data
➢ Multi-source Data fusion and matching technology
➢ Automatic driving data security technology
➢ Autonomous decision-making and control based on HD map

[TO BE COMPLETED BY THE PROPOSERS]

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

Special Issue Editors:

➢ Diange Yang, Professor, Tsing Hua University
➢ Mengmeng Yang, Assistant Researcher, Tsinghua University,
➢ Xue Wan, Professor, Chinese Academy of Sciences
➢ Jin Huang, Associate researcher, Tsinghua University
➢ Kun Jiang, Assistant researcher , Tsinghua University
➢ Junjie Chen, Research assistant, Tsinghua University
➢ Wenshuo Wang, Research Fellow, Mcgill University
➢ Zhong Cao, Assistant researcher , Tsinghua University

● Intended audience and expected attendance of the special session:
This special session mainly attracts graduate students and researchers from schools and research institutes, as well as practitioners related to automatic driving

● Materials and equipment needed for the special session:
A meeting room can accommodate about 50 people, and the conference room has a projection screen, microphone, speaker, and other equipment.

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