IV 2018
The 29th IEEE Intelligent Vehicles Symposium
Sponsored by the IEEE Intelligent Transportation Systems Society (ITSS)

Changshu, China
June 26 - June 30, 2018
Welcome to IEEE IV 2018 at Changshu, Suzhou, China - a national historic and cultural city. We trust that you will have a technically and culturally rewarding experience and many wonderful memories at this exciting place. First of all, IEEE IV 2018 has an extraordinary technical program. We would like to thank the members of the International Program Committee, authors, reviewers, session chairs, and organizers of the affiliated workshops, tutorials, and special sessions, for making the technical program a great success. Special thanks go to the Program Chair, Nanning Zheng (Xi’an Jiaotong University, China), and Program Co-Chairs Li Li (Tsinghua University, China), Lingxi Li (Indiana University-Purdue University Indianapolis, USA), and Dongpu Cao (University of Waterloo, Canada). We are grateful to six keynote speakers, Gill Pratt (Toyota Research Institute, Japan), Xin Xu (National University of Defense Technology, China), Jack Weast (Intel, USA), Xiaodong Zhang (Geely Holding Group, China), Ljubo Vlacic (Griffith University, Australia), and Long Chen (Sun Yat-Sen University, China).

We would also like to thank the members of the IEEE IV 2018 organizing committee: Special Sessions & Tutorials Chairs, Yihong Gong (Xi’an Jiaotong University, China), Yuehu Liu (Xi’an Jiaotong University, China), Chen Lv (Cranfield University, UK), and Hong Wang (University of Waterloo, Canada); Workshop Chairs, Yaobin Chen (IUPUI, USA), Yisheng Lv (Chinese Academy of Sciences, China), Yunfeng Ai (University of Chinese Academy of Sciences, China), and Teng Liu (Chinese Academy of Sciences, China); Awards Chairs, Petros A. Ioannou (University of Southern California, USA), Amir Khajepour (University of Waterloo, Canada), and Markus Papageorgiou (Technical University of Crete, Greece); Industry Outreach Chairs: Tao Mei (Suzhou Rongcui Robot Co. Ltd., China) and Ning Bian (Dongfeng Motor Corporation, China); Finance Chair, Hongxia Zhao (Chinese Academy of Sciences, China); Publication Chairs, Yanqing Gao (Oregon Institute of Technology, USA), Long Chen (Sun Yat-Sen University, China), Wei He (University of Sciences and Technology Bejing, China), Jian Wang (Jilin University, China), and Chengguang Yang (South China University of Technology, China); Exhibition & Demonstration Chairs, Jingmin Xin (Xi’an Jiaotong University, China), Wuling Huang (Chinese Academy of Sciences, China), Huaj, Wang (Cranfield University, UK), Huilong Yu (Chinese Academy of Sciences, China), and Yuan Lin (Virginia Tech, USA); Publicity Chairs, Xiaoxi Wang (Chinese Academy of Sciences, China), Kazuyu Takeda (Nagoya University, Japan), Ge Guo (Dalain Maritime University, China), and Yiija Zhang (JazzYear, China), Local Chairs, Nan Zhang (Chinese Association of Automation, China), Qifeng Wang (Changshu Hi-Tech Industrial Development Zone, China), Qiang Yu (Chang’an University, China), Xueliang Zhao (Chinese Association of Automation, China), and Tan Wang (Chinese Association of Automation, China); Registration Chairs, Jianru Xue (Xi’an Jiaotong University, China), Shuangshuang Han (Chinese Academy of Sciences, China), Xiaoyan Gong (Chinese Academy of Sciences, China), and Dixiao Cui

Last but not the least, we would like to express our sincere thanks to Changshu Metropolitan Government and Chinese Intelligent Vehicle Proving Center (iVPC), for their strong support of IEEE IV 2018 activities. Special thanks go to IEEE ITS society, Chinese Association of Automation, and industrial sponsors for their technical/financial sponsorship. Thanks to all participants for joining in and contributing to IEEE IV 2018!

Make friends at the IEEE IV 2018 and have a great time at Changshu, Suzhou, China!

Fei-Yue Wang            General Chair
Petros A. Ioannou      General Co-Chair
Miguel Ángel Sotelo    General Co-Chair
Welcome Address

(Xi’an Jiaotong University, China); Student Activity Chairs, Shitao Chen (Xi’an Jiaotong University, China), Chao Gou (Chinese Academy of Sciences, China), and Zyi Liu (Xi’an Jiaotong University, China). The entire IEEE IV 2018 local team who has helped put the conference together deserves our sincere gratitude. Our special thanks also go to many volunteers and staff members for the long hours and hard work they have generously invested in IEEE IV 2018.

Last but not the least, we would like to express our sincere thanks to Changshu Metropolitan Government and Chinese Intelligent Vehicle Proving Center (iVPC), for their strong support of IEEE IV 2018 activities. Special thanks go to IEEE ITS society, Chinese Association of Automation, and industrial sponsors for their technical/financial sponsorship. Thanks to all participants for joining in and contributing to IEEE IV 2018!

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Fei-Yue Wang General Chair
Petros A. Ioannou General Co-Chair
Miguel Angel Sotelo General Co-Chair

Welcome Address

WELCOME MESSAGE
FROM THE PROGRAM CHAIRS AND CO–CHAIRS

As a premier gathering of the ITS community, the IEEE IV 2018 brings together researchers and practitioners worldwide to share and discuss the latest advances in theory and technology related to intelligent vehicles. There is no doubt that IV research community has been expanding around the globe in recent years.

IEEE IV 2018 has attracted a record number of 603 submissions. Following a rigorous peer-review process, a total of 346 papers were accepted, among which there are 276 Contributed Papers, 20 Special Session papers, and 50 Workshop Papers. In particular, 33 papers (~6%) with outstanding reviews were invited as oral presentations, while others were scheduled as poster presentations. The submitted papers, based on the author-provided keywords, cover a wide range of research areas including: Automated Vehicles (96), Vision Sensing and Perception (54), Autonomous / Intelligent Robotic Vehicles (43), Self-Driving Vehicles (38), Mapping and Localization (36), Advanced Driver Assistance System (34), among others.

IEEE IV 2018 is truly an international event, with submissions coming from 34 countries. China leads with the largest number of submissions (259), followed by Germany (84), the United States (64), Japan (33), France (25), among others.

We have organized the technical program by research topics in 69 parallel sessions. The sessions are grouped in “tracks” with similar topics presented in the same rooms each day. In addition, the conference program features 19 workshops, 1 tutorial, and 9 special sessions. Together with IV 2018, an on-road autonomous driving demonstration is also scheduled at the Chinese flagship Intelligent Vehicle Proving Center (iVPC), Changshu, Suzhou, China.

At last, we would like to express our sincere gratitude to the reviewers, associated editors, and members of the international program committee for all of their efforts on helping with paper review process of IV 2018.

It is our hope that your participation in IV 2018 will be a rewarding experience and that you will get a chance to engage in meaningful dialogues with other colleagues working in this exciting area of IV!

Nanning Zheng Program Chair
Li Li Program Co-Chair
Lingxi Li Program Co-Chair
Dongpu Cao Program Co-Chair
The 2018 IEEE Intelligent Vehicles Symposium (IV’18) is a premier annual technical forum sponsored by the IEEE Intelligent Transportation Systems Society (ITSS). It brings together researchers and practitioners worldwide to share and discuss the latest advances in theory and technology related to intelligent vehicles. It welcomes articles dealing with any aspect of intelligent vehicles, as well as proposals for workshops and tutorial sessions. Demonstration and Exhibition related to intelligent vehicles are also welcome.

Together with IV’18, an on-road autonomous driving demonstration will be held at the Chinese flagship Intelligent Vehicle Proving Center (IVPC), Changshu, Suzhou, China, which is a county-level city located in the lower reaches of the Yangtze River in Jiangsu Province. Its envied cultural history, beautiful landscape, and abundant produce have won itself a great admiration in east China.
Conference Committees

Hosts

- IEEE Institute of Electrical and Electronics Engineers (IEEE)
- IEEE Intelligent Transportation Systems Society (ITSS)

Organizers

- The State Key Laboratory for Management and Control of Complex Systems
- Chinese Association of Automation
- Institute of Artificial Intelligence and Robotics, Xi'an Jiaotong University
- Institute of Automation, Chinese Academy of Sciences
- National Engineering Laboratory for Visual Information Processing and Applications
- Qingdao Academy of Intelligent Industries

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Supporting periodicals

- IEEE Transactions on Intelligent Vehicles
- IEEE Transactions on Intelligent Transportation Systems
- IEEE/CAA Journal of Automatica Sinica
- IEEE Intelligent Transportation Systems Magazine
- Acta Automatica Sinica
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Canada Research Chair and NSERC/GM Industrial Chair
University of Waterloo
Markos Papageorgiou
Professor
Department of Production Engineering and Management
Technical University of Crete
Important Information

Time: June 26–30, 2018

Venue: Changshu International Hotel
(No. 288, Huanghe Road, Changshu, Jiangsu Province)

Agenda: June 26–29, 2018, Academic Lectures and Discussion
June 30, IEEE IV 2018 On-road Demonstration:
From Parallel Driving to Smart Mobility

Registration

Registration Time: All Day June 25
08:00 - 18:00 June 26 - June 30

Place: Lobby (Main building) (June 25 – 26)
Conference Center (June 27 – 30)

Contacting the Organizing Committee

Xiao Wang (18810460472)
Nan Zhang (15901208396)
Xueliang Zhao (15801040567)

Participant Notice

Welcome to The 2018 IEEE Intelligent Vehicles Symposium (IV 2018).
For your convenience of participating in conference
Please read this notice.

1. For details of each activity plan, please refer to the conference agenda, according to which you could participate in relevant forums and activities. There will be further notice in case of any changes.

2. Guest card is required at any forum and activity. Please take it with you.

3. Security check is necessary when you entry the conference hall. Please entry the hall orderly and take part in activities punctually, in order to avoid any pushing, shoving or stampede accidents.

4. Please kindly comply with the rules during the conference. Please keep in order, dress neatly with dignified behaviors and high spirit. During the conference, please avoid walking around in the hall and turn off your phone or keep it in silent model. You should answer the phone call out of the conference hall.

5. Please remind and take care of each other during the conference and follow the guidance of the staff.

6. In case of any emergency, please keep calm, obey the staff’s command and evacuate safely.

7. Dining reception will be arranged by the organizer during the conference at the appointed place on the meal coupon. The coupons cannot be used universally in different dining halls. Please keep them well.

8. The hotel offers free wifi in public areas. ID: csihotel, No Password
Transportation and Venue Location

I. Public Coach Services
There are three airports near the Changshu International Hotel (see below), public coach services are provided between these three airports and the Changshu Bus Terminal all the year round. You can purchase the ticket on WeChat through the following procedures: download and install the WeChat, focus on the WeChat Public Account “常熟汽车客运集团”，click on “机场专线”, and select the destination. The fare is RMB 80-150.

II. Exclusive Shuttle Services for IEEE IV 2018
There will be free shuttle buses to Shanghai International Airport, Sunan Shuofang International Airport and Suzhou North Station on June 29 and 30 from the Changshu International Hotel.

The shuttle bus schedules are as below:

1. June 29, 2018
Changshu International Hotel (常熟国际饭店) → Hongqiao International Airport (上海虹桥国际机场)

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<td>08:00</td>
<td>Changshu North Station (常熟北站)</td>
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2. June 30, 2018
Changshu International Hotel (常熟国际饭店) → Pudong International Airport (上海浦东国际机场)

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Changshu International Hotel (常熟国际饭店) → Sunan Shuofang International Airport (苏南硕放国际机场)

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Changshu International Hotel (常熟国际饭店) → Suzhou North Station (苏州北站)

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Hotel Floor Plan

Exhibition Floor Plan
Plenary Lecture 1

June 27, 08:30 - 09:15 (Wed)

Autonomous Learning for Decision-making and Control of Intelligent Vehicles
Xin Xu
Professor, National University of Defense Technology, China
Location: Conference Center

Presentation Abstract:
Decision-making and motion control of intelligent vehicles have been an important research topic in recent years. Due to the complexity and uncertainties in external environments and internal dynamics, it is necessary to develop autonomous learning techniques for optimal decision-making and control of intelligent vehicles. In this talk, recent advances in the theory and algorithms of reinforcement learning with value function approximation will be introduced to deal with autonomous learning tasks with large or continuous state spaces. Based on these autonomous learning methods, the frameworks and models of self-learning decision-making and control of intelligent vehicles will be presented. Some simulation and experimental results will also be provided to evaluate the performance of self-learning decision-making and control methods. The open problems for future research will also be discussed in this talk.

Bio:
Prof. Xin Xu received the B.S. degree in electrical engineering from the Department of Automatic Control, National University of Defense Technology (NUDT), Changsha, P. R. China, in 1996 and the Ph.D. degree in control science and engineering from the College of Mechatronics and Automation (CMA), NUDT. He has been a visiting scientist for cooperation research in the Hong Kong Polytechnic University, University of Alberta, and the University of Strathclyde, respectively. Currently, he is a full Professor and Director with the Institute of Unmanned Systems, College of Intelligence Science and Technology, NUDT. His main research areas include: reinforcement learning and intelligent vehicles, learning control, robotics and machine learning. He has coauthored four books and published more than 150 papers in international journals and conferences. He is an associate editor of Information Sciences, CAAI Transactions on Intelligence Technology, Acta Automatica Sinica, Intelligent Automation and Soft Computing. He has also been a Guest Editor of IEEE Transactions on Systems, Man and Cybernetics: Systems, International Journal of Social Robotics, International Journal of Adaptive Control and Signal Processing. Prof. Xu is one of the recipients received the 2nd class National Natural Science Award of China in 2012, the 1st class Natural Science Award from Hunan Provinces, P. R. China, in 2009 and the Fork Ying Tong Youth Teacher Fund of China in 2008. He is a Senior Member of IEEE, a Committee Member of the IEEE Technical Committee on Approximate Dynamic Programming and Reinforcement Learning (ADPRL) and the IEEE Technical Committee on Robot Learning. He has served as a PC member or Session Chair in many international conferences.

Plenary Lecture 2

June 27, 09:15 - 10:00 (Wed)

Parallel Driving: Framework, Theoretical Development, and Applications
Long Chen
PhD, Co-Founder & CEO, Vehicle Intelligence Pioneers Inc.
Director of Autonomous Driving Lab at Sun Yat-sen University, China
Location: Conference Center

Presentation Abstract:
The emerging development of connected and automated vehicles imposes a significant challenge on current vehicle control and transportation systems. Parallel driving, a cloud-based cyber-physical-social system (CPSS) framework, was proposed in 2004, and has been developed since then, for enhancing the performance and safety of connected automated vehicles. This talk will present the framework as well as the theoretical development of parallel driving in the past fifteen years, including parallel vision/perception, parallel reinforcement learning, and parallel planning/control. A novel concept of digital quadruplet for parallel driving vehicles is further defined, which consists of the vehicle-based autonomous driving system and three "guardian angels", namely descriptive vehicle, predictive vehicle, and prescriptive vehicle that are developed in the artificial world. How the digital quadruplet for parallel driving vehicles operates will be discussed. This talk will further present a few selected real-world applications of parallel driving, such as parallel autonomous mining, parallel autonomous logistic vehicles, and parallel testing.

Bio:
Dr. Long Chen is currently an Associate Professor with School of Data and Computer Science, Sun Yat-sen University, Guangzhou, China. His areas of interest include parallel autonomous driving, robotics, artificial intelligence where he has contributed more than 70 publications. He serves as an Associate Editor for IEEE Technical Committee on Cyber-Physical Systems newsletter. He has been working on autonomous driving for over 10 years and holds more than 30 Chinese patents. His group has closely collaborated with Ericsson, SAIC Motor, Haima Automobile, China Southern Power Grid, and Vipshop.
Plenary Lecture 3
June 28, 08:30 – 09:15 (Thu)

An Open, Transparent, Industry-driven Approach to AV Safety
Jack Weast
Sr. Principal Engineer and the Chief Systems Architect for Automated Driving Solutions at Intel

Presentation Abstract:
At Intel and Mobileye, saving lives drives us. But in the world of automated driving, we believe safety is not merely an impact of AD, but the bedrock on which we all build this industry. And so we proposed Responsibility-Sensitive Safety (RSS), a formal model to define safe driving and what rules an automated vehicle, independent of brand or policy, should abide to always keep its passengers safe. We intend this open, non-proprietary model to drive cross-industry discussion; let’s come together as an industry and use RSS as a starting point to clarify safety today, to enable the autonomous tomorrow.

Bio:
Jack Weast is a Sr. Principal Engineer and the Chief Systems Architect for Automated Driving Solutions at Intel. In his nearly 20 year career at Intel, Jack has built a reputation as a change agent in new industries with significant technical contributions to a wide range of industry-first products and standards in complex heterogeneous high performance compute solutions in markets that are embracing high performance computing for the first time. With an End to End Systems perspective, Jack combines a unique blend of embedded product experience with a knack for elegant Software and Systems design that will accelerate the adoption of Autonomous Driving.

Dr. Pratt is the Chief Executive Officer of Toyota Research Institute (TRI) and a Fellow of Toyota Motor Corporation (TMC). Prior to joining TRI as its founding CEO, Dr. Pratt served as an Executive Technical Advisor to Toyota Motor Corporation.

TRI’s mission is to improve the quality of human life through innovation in artificial intelligence, automated vehicles, and robotics. As TMC Fellow, Dr. Pratt applies his technical expertise to guide TMC’s Advanced R&D company in the areas of automated driving and Artificial Intelligence.

Prior to joining Toyota, Dr. Pratt led the Robotics Challenge of the U.S. Defense Advanced Research Projects Agency (DARPA), where he served as a program manager in the Defense Sciences and Tactical Technology offices from January 2010 through August 2015.

Dr. Pratt’s primary interest is in the field of robotics and intelligent systems. Specific areas include interfaces that significantly enhance human/machine collaboration, mechanisms and control methods for enhanced mobility and manipulation, low impedance actuators, and the application of neuroscience techniques to robot perception and control. Dr. Pratt is also interested in the impact of Robotics and AI on society.

Dr. Pratt holds Doctor of Philosophy, Master of Science, and Bachelor of Science degrees in Electrical Engineering and Computer Science from the Massachusetts Institute of Technology (MIT). His Ph.D. thesis was in the field of spiking computation in natural and artificial neural systems. Dr. Pratt was an Associate Professor and Director of the Leg Lab at MIT. Subsequently, he became a Professor and Associate Dean of Faculty Affairs and Research at Franklin W. Olin College. Dr. Pratt holds several patents in series elastic actuation and adaptive control.

Plenary Lecture 4
June 28, 09:15 – 10:00 (Thu)

The Multiple Motivations, Approaches, and Benefits of Automated Driving Technology for China and the World
Gill Pratt
Chief Executive Officer of Toyota Research Institute (TRI)

Presentation Abstract:
The development of Automated Driving Technology is motivated by a desire for improvement in eight areas: Safety, Access, Convenience, Time, Traffic, Environment, Economics, and Fun. By appreciating all eight areas, we discover that automated driving technology has many uses beyond self-driving taxis. This talk will explain how Toyota broadly thinks about automated driving technology, and why we believe multiple approaches to using automated driving technology can improve quality of life in many ways in China, and the world.

Bio:
Dr. Gill Pratt is the Chief Executive Officer of Toyota Research Institute (TRI) and a Fellow of Toyota Motor Corporation (TMC). Prior to joining TRI as its founding CEO, Dr. Pratt served as an Executive Technical Advisor to Toyota Motor Corporation.

TRI’s mission is to improve the quality of human life through innovation in artificial intelligence, automated vehicles, and robotics. As TMC Fellow, Dr. Pratt applies his technical expertise to guide TMC’s Advanced R&D company in the areas of automated driving and Artificial Intelligence.

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Plenary Lecture 5

June 29, 08:30 - 09:15 (Fri)

Research and Technology Innovation of Intelligent Electrified Passenger Vehicles: Geely’s Strategy and Vision

Xiaodong Zhang
Director of Geely Group Technology Department, Committee Secretary of Geely Research Institute
Location: Conference Center Host: Dr. Dongpu Cao

Presentation Abstract:
Development of intelligent electrified passenger vehicles has been gaining substantial attention in China and worldwide in the past two decades, for enhanced road safety and driving efficiency, as well as reduced vehicle emission. Within this context, I will give a brief introduction to Geely Auto Company, and present the technology roadmap and research innovation strategies in both electrified vehicles and intelligent vehicles at Geely Auto. The structure and development of G-Power, G-Safety, G-Pilot, G-Netlink, and G-Blue will be described in detail. This talk will conclude with Geely’s vision and ambition on future generation of intelligent electrified passenger cars, towards safer, greener, and more efficient intelligent transportation systems.

Bio:
Xiaodong Zhang, Director of Geely Group Technology Department, Committee Secretary of Geely Research Institute. Member of China Society of Automotive Engineering, Awarded the first prize of “China automobile industry science and Technology Award” in 2012.

Plenary Lecture 6

June 29, 09:15 - 10:00 (Fri)

Are You Ready to Take Over?
Ljubo Vlacic
Professor, Griffith University’s Institute for Integrated & Intelligent Systems
Location: Conference Center Host: Dr. Dongpu Cao

Presentation Abstract:
Although intelligent vehicles research has achieved its prominence, there have been a number of issues that are yet to be addressed, in order for intelligent vehicles to bring a quality change to people’s mobility and intelligent vehicle riding comfort. The talk is aimed at sharing with the audience the speaker’s personal views on a number of yet unresolved issues, as well as on some controversies in contemporary solution developments. Interaction with the audience and questions from the floor, on the go, in real-time, is encouraged.

Bio:
Professor Emeritus Ljubo Vlacic is with Griffith University’s Institute for Integrated & Intelligent Systems. He is a control systems scientist and practitioner, renowned for his contributions to co-operative driverless vehicles and intelligent control systems research and development. His research achievements made news headlines and were broadcast through media outlets throughout the world. He has held a number of leading roles in both industry and academia. In recognitions of his achievements, he received 19 awards including the IEE Achievement Medal (World-wide), Sir Lionel Hooke Award, Queensland Professional Engineer of the Year Award and the Gold Coast Business Events Ambassador Award. He hosted 10 national and international scientific conferences. Currently, he is: (i) Editor-in-Chief, IEEE–Intelligent Transportation Systems Magazine; (ii) Chair of the Board, Engineers Australia – IEE College; (iii) Chair, IET Network Queensland; and (iv) General Chair, the 2019 IEEE - Intelligent Transportation Systems Conference ITSC2019. He also graduated from the Conservatorium of Music (Violin) and has played with professional philharmonic and symphony orchestras.
## Workshops & Tutorials

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<tr>
<th>Time</th>
<th>Location</th>
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<th>Co-Chair</th>
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<tr>
<td>08:30 - 12:00</td>
<td>RenHe Hall 2</td>
<td>TuWS1T1: Elemental Technologies for Autonomous Driving with Realistic Onboard Sensors: from Software to Hardware in the Real World and the Cyber World</td>
<td>Yoshiko Kojima, Seiichi Mita</td>
<td>Chunzho Guo, Vijay John</td>
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<td></td>
<td>ZhaoWen Hall</td>
<td>TuWS1T2: Human Machine Interface in Intelligent Vehicles-1</td>
<td>Rencheng Zheng, Zhenghui Gao, Xinwu Ji</td>
<td>Kimihiko Nakano</td>
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<td>TianHu Hall</td>
<td>TuWS1T3: Parallel Vision in Intelligent Vehicles</td>
<td>Kunfeng Wang</td>
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<td></td>
<td>FangTa Hall</td>
<td>TuWS1T4: IV Test Technologies</td>
<td>Qingwen Han, Jianmei Lei</td>
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<td>ShaJiaBang Hall</td>
<td>TuWS1T5: Intelligent Vehicles for Education</td>
<td>Xiwei Liu, Jiehan Zhou, Xiaoyan Gong</td>
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<td>MeiLi Hall</td>
<td>TuWS1T6: Decision-Making and Control on Driver Automation Interaction</td>
<td>Wenshuo Wang, Xiaoxiang Na, Jiawei Li, Wei Zhao</td>
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<td>ZhiTang Hall</td>
<td>TuWS1T7: Driver Vigilance Estimation for Vehicle Active Safety-1</td>
<td>Bao-Liang Lu</td>
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<td>LongLiQi Hall</td>
<td>TuWS1T8: 2018 IEEE/IFAC Conference on Blockchain and Knowledge Automation-1</td>
<td>Fei-Yue Wang, Yong Yuan, Xiaowei Zhang, Kaimin Valavanis, Philip Chen</td>
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<td>HaiYu Hall</td>
<td>TuWS1T9: Security and Privacy Protection for Internet of Vehicles</td>
<td>Jian Wang, Yuming Ge</td>
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<td>XinZhuang Hall</td>
<td>TuWS1T10: Scene Understanding for Automated Driving Systems</td>
<td>Jianru Xue, Ming Yang, Huajing Zhao, Jianwu Fang</td>
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<td>RenHe Hall 1</td>
<td>TuWS1T15: Connected and Automated Vehicle-based Cooperative Traffic Operation for Urban Driving</td>
<td>Guoyuan Wu</td>
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### Workshops & Tutorials Timing:

- **12:00 - 13:30**
  - **Lunch**

- **13:30 - 17:00**
  - **TuWS2T1**: The 5th Workshop on Naturalistic Driving Data Analytics
    - **Chair**: Huiying Zhao
    - **Co-Chair**: Donghao Xu
  - **TuWS2T2**: Human Machine Interface in Intelligent Vehicles-2
    - **Chair**: Rencheng Zheng
    - **Co-Chair**: Zhenghui Gao, Xinwu Ji, Wenbin Hou
  - **TuWS2T3**: Intelligent Transportation and Autonomous Vehicles
    - **Chair**: Huiyun Li
    - **Co-Chair**: Lei Peng, Tianfu Sun, Zheng Wang
  - **TuWS2T4**: CPS-Based Modeling and Optimization Control of Renewable Energy Vehicles
    - **Chair**: Teng Liu
    - **Co-Chair**: Yuan Zou, Xudong Zhang, Huihang Yu
  - **TuWS2T5**: Multi-Sensor Fusion and Extended Object Tracking for Autonomous Vehicles & Intelligent Driving for Autonomous Driving Vehicles & Communication for Connected and Cooperative Driving
    - **Chair**: Karl Granström
    - **Co-Chair**: Xinyu Zhang, Jean-Philippe Lauffenburger
  - **TuWS2T6**: Connected and Automated Vehicles
    - **Chair**: Ge Guo
    - **Co-Chair**: Shengbo Eben Li, Yanming Tian, Hongbo Gao
  - **TuWS2T7**: Driver Vigilance Estimation for Vehicle Active Safety-2
    - **Chair**: Bao-Liang Lu
  - **TuWS2T8**: Cooperative Perception among Multiple Intelligent Vehicles
    - **Chair**: Zhe Xuanyuan
    - **Co-Chair**: Long Chen, Kai Huang, Xuemin Hu, Yunxiao Shan
  - **TuWS2T9**: 2018 IEEE/IFAC Conference on Blockchain and Knowledge Automation-2
    - **Chair**: Fei-Yue Wang
    - **Co-Chair**: Yong Yuan, Jiaojun Zhang, Kaimin Valavanis, Philip Chen
  - **TuWS2T10**: V2X Communications: Overview, Technical Challenges, and Applications in Safety and Automated Driving
    - **Chair**: Bansal Gaurav
    - **Co-Chair**: Kenney John
Workshops & Tutorials
2018.06.26 (Tuesday)

TuWST11 RenHe Hall 2
Elemental Technologies for Automated Driving with Realistic Onboard Sensors: from Software to Hardware in the Real World and the Cyber World

Session I
Chair: Yoshiko Kojima
Co-Chair: Chunzhao Guo

Greetings
08:30–08:35
Seichi Mita
Toyota Technological Institute

Keynote Speech
08:35–09:20
Autoware: university challenges of democratizing mobility technologies and values
Kazuya Takeda
Nagoya University

09:20–09:35
General Forward Obstacle Detection using Current and Extra Trees Regression
Vijay John
Toyota Technological Institute

11:40–11:55
Freesway Merging in Congested Traffic Based on Multi-policy Decision Making with Passive Actor-Critic
Tomoki Nishi
Toyota Central R&D Labs., Inc.

TuWST12 ZhaoWen Hall
Human Machine Interface in Intelligent Vehicles-1
Chair: Yaosheng Zheng
Co-Chair: Zhenghai Gao, Kinikho Nakano, Xiaowui Ji

Paper TuWST12.1 08:30–09:00
Automatic Analysis of Pedestrian’s Body Language in the Interaction with Autonomous Vehicles
Morales-Alvarez, Walter
Mechatronics Res. Group, Simon Bolivar Univ. Caracas
Gomez, Maria Jose
Univ. Cartagena De Madrid
Fernandez, Gerardo
Univ. Simon Bolivar
Garcia, Fernando
Univ. Cartagena De Madrid
Olavari-Monsal, Cristina
UAS Tech. Wan

Paper TuWST12.2 09:00–09:30
Real-Time Traffic Scene Segmentation Based on Multi-Feature Map and Deep Learning
Linhui Li
Dalian Univ. of Tech
Wenxia Zhang
Dalian Univ. of Tech
Ling Zhao, Kongnan
Dalian Univ. of Tech
Ouyang, Jun
Qiqi Univ.
Wenhan Hou
Dalian Univ. of Tech
Jing Lian
Dalian Univ. of Tech

Paper TuWST12.3 09:30–10:00
A Biosignal Based Driving Experience Analysis for Curved Road: An Initial Implementation
Hongyu Hu
Jilin Univ.
Zhenhui Gao
Jilin Univ.
Yuhuan, Zeng
Jilin Univ.
Fai, Gao
Jilin Univ.
Rencheng, Zhang
Dalian Univ. of Tech
Xingta, Mai
Guangzhou Automobile Group Co., Ltd.
Jin, Zhang
Guangzhou Automobile Group Co., Ltd.

Paper TuWST12.4 10:00–10:30
Analysis of Driver Behaviors While Using In-Vehicle Traffic Light with Partial Deplyment of V2I Communication
Bo, Yang
The Univ. of Tokyo
Rencheng, Zhang
Dalian Univ. of Tech
Kazuaki, Tsutsumi
The Univ. of Tokyo
Nakano, Kimihiko
Univ. of Tokyo

Paper TuWST12.5 11:00–11:30
An Application of Particle Swarm Algorithms to Optimize Hidden Markov Models for Driver Fatigue Identification
Mingyang, Zhang
Dalian Univ. of Tech
Xiaoyan, Zhai
Dalian Univ. of Tech
Guang, Zhao
Dalian Univ. of Tech
Tonghong, Chong
Dalian Univ. of Tech
Zheng, Wang
The Univ. of Tokyo

Paper TuWST12.6 11:30–12:00
Longitudinal Control Strategy of Collision Avoidance Warning System for Intelligent Vehicle Considering Drivers and Environmental Factors
Yibing, Zhao
Dalian Univ. of Tech
Xumei, Xiang
School of Automobile Engineering, Dalian Univ. of Tech
Ronghui, Zhang
Guangdong Key Lab. of Intelligent Transportation System
Liu, Guo
Dalian Univ. of Tech
Zheng, Wang
The Univ. of Tokyo

TuWST13 TianHua Hall
Parallel Vision in Intelligent Vehicles
Chair: Kungfeng Wang

Invited Talk1 08:30–12:00
Kunfeng, Wang
Institute of Automation, Chinese Academy of Sciences

Invited Talk2 08:30–12:00
Hui, Zhang
Institute of Automation, Chinese Academy of Sciences

Invited Talk3 08:30–12:00
Wenwen, Zhang
Xian Jiaotong University

Invited Talk4 08:30–12:00
Yue, Lu
Institute of Automation, Chinese Academy of Sciences

Paper TuWST13.1 08:30–12:00
The ParallelEye-CS Dataset: Constructing Artificial Scenarios for Evaluating the Visual Intelligence of Intelligent Vehicles
Xuan, Li
Beijing Inst. of Tech
Yutong, Wang
Beijing Inst. of Tech
Kunfeng, Wang
Beijing Inst. of Tech
Lan, Yan
Beijing Inst. of Tech
Fei-Yue, Wang
Chinese Acad. of Sciences

Paper TuWST14 FangTa Hall
IV Test Technologies
Chair: Qinglie He
Co-chair: Jianmiao Lu

Invited Talk 08:30–12:00
The test and validation challenges of sensor fusion for ADAS
Murali Ravindran
Director, Automotive, Global Business Development, National Instruments

Invited Talk 08:30–12:00
The test certification approach for C-V2X terminal device
Yuming, Ge
China Academy of Information and Communications Technology

Invited Talk 08:30–12:00
The test platform and evaluation standard system for self-driving car
Tao, Chan
Doctor, China automotive engineering research institute

Paper TuWST14.1 08:30–12:00
Semi-Virtual Test for IV/C in Automotive EMC Laboratory
Jiarui, Lei
State Key Lab. of Vehicle NVH and Safety Tech. & Chan
Qingwen, Han
Chongqing Univ.
Xu, Yang
Chongqing Univ.
Li, Fengyi
Chongqing Univ.
Chen, Rui
Univ. of Electronic Science and Tech. of China, China
Chen, Lidong
State Key Lab. of Vehicle NVH and Safety Tech. Chong
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<tr>
<th>Session</th>
<th>Location</th>
<th>Time</th>
<th>Title</th>
<th>Speaker(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper TuWS1T1</td>
<td>RenHe Hall 2</td>
<td>09:35-09:50</td>
<td>The Nighttime stereo Vision and Its Application</td>
<td>Kazuya Takeda, Nagoya University</td>
</tr>
<tr>
<td>Paper TuWS1T2</td>
<td>LongLiQi Hall</td>
<td>11:40-11:55</td>
<td>Multi-Feature Map and Deep Learning</td>
<td>Jing, Lian, Dalian Univ. of Tech; Ozguner, Umit, Ohio State Univ.</td>
</tr>
<tr>
<td>Paper TuWS1T3</td>
<td>LongLiQi Hall</td>
<td>11:30-12:00</td>
<td>Hidden Markov Models for Driver Fatigue Identification</td>
<td>Seigo Ito, Toyota Central R&amp;D Labs., Inc.</td>
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<tr>
<td>Paper TuWS1T4</td>
<td>LongLiQi Hall</td>
<td>08:30-12:00</td>
<td>Artificial Intelligence Course Design: Istream-Based Visual</td>
<td>Jie, Liu, Tsinghua University, China</td>
</tr>
<tr>
<td>Paper TuWS1T5</td>
<td>LongLiQi Hall</td>
<td>08:30-12:00</td>
<td>Terminals: EMC Test for Connected Vehicles and Communication</td>
<td>Fei, Xie, China Automotive Engineering Res. Inst.</td>
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<tr>
<td>Paper TuWS1T6</td>
<td>LongLiQi Hall</td>
<td>08:30-12:00</td>
<td>Coached Talk: Artificial Intelligence Course Design:</td>
<td>Shengbo Eben Li, Yantao Tian, Hongbo Gao</td>
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<tr>
<td>Paper TuWS1T7</td>
<td>LongLiQi Hall</td>
<td>08:30-12:00</td>
<td>Decision-Theoretic Cooperative Parking for Connected Vehicular</td>
<td>Chunxiang, Wang, Shanghai Jiao Tong Univ.</td>
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<tr>
<td>Paper TuWS1T8</td>
<td>LongLiQi Hall</td>
<td>08:30-12:00</td>
<td>The cybersecurity protection and assessment practices of ICV</td>
<td>Yong, Yuan, Qingdao Acad. of Intelligent Industries</td>
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<tr>
<td>Paper TuWS1T9</td>
<td>LongLiQi Hall</td>
<td>08:30-12:00</td>
<td>Automated Toll Gate Passing</td>
<td>Fei-Yue, Wang, China Automotive Engineering Res. Inst.</td>
</tr>
<tr>
<td>Paper TuWS1T10</td>
<td>LongLiQi Hall</td>
<td>08:30-12:00</td>
<td>Automatic Driving</td>
<td>Yechen, Qin, Beijing Inst. of Tech; Chuan, Hu, Univ. of Waterloo;</td>
</tr>
<tr>
<td>Paper TuWS2T1</td>
<td>FangTa Hall</td>
<td>13:30-17:00</td>
<td>The 29th IEEE Intelligent Vehicles Symposium</td>
<td>Yong, Yuan, Qingdao Acad. of Intelligent Industries</td>
</tr>
<tr>
<td>Paper TuWS2T2</td>
<td>FangTa Hall</td>
<td>13:30-17:00</td>
<td>V2X Communications: Overview, Technical Challenges, and Applications in Safety and Automated Driving</td>
<td>Yechen, Qin, Beijing Inst. of Tech; Chuan, Hu, Univ. of Waterloo;</td>
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## Technical Program  Wednesday June 27

### Keynote

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<tr>
<td>08:30</td>
<td>Xin Xu</td>
<td>Autonomous Learning for Decision-making and Control of Intelligent Vehicles</td>
<td>Conference Center</td>
<td>Dr. Lingxi Li</td>
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<td>09:15</td>
<td>Long Chen</td>
<td>Framework, Theoretical Development, and Applications</td>
<td>Conference Center</td>
<td>Dr. Lingxi Li</td>
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### Oral Sessions A: Vision Sensing and Perception

**Location:** Conference Center

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<tr>
<td>10:20</td>
<td>Towards End-To-End Lane Detection: An Instance Segmentation Approach</td>
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<tr>
<td>10:40</td>
<td>Box2Pix: Single-Shot Instance Segmentation by Assigning Pixels to Object Boxes</td>
</tr>
<tr>
<td>11:00</td>
<td>Real-Time Semantic Segmentation-Based Depth Upsampling Using Deep Learning</td>
</tr>
<tr>
<td>11:20</td>
<td>Probabilistic Prediction of Vehicle Semantic Intention and Motion</td>
</tr>
<tr>
<td>11:40</td>
<td>Accurate Localization in Underground Garages Via Cylinder Feature Based Map Matching</td>
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### Oral Sessions B: Vehicle Motion Planning and Testing

**Location:** Conference Center

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<tr>
<td>13:30</td>
<td>A Graded Offline Evaluation Framework for Intelligent Vehicle's Cognitive Ability</td>
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<td>13:50</td>
<td>From G2 to G3 Continuity: Continuous Curvature Rate Steering Functions for Sampling-Based Nonholonomic Motion Planning</td>
</tr>
<tr>
<td>14:10</td>
<td>Cooperative Lane Change Motion Planning of Connected and Automated Vehicles: A Stepwise Computational Framework</td>
</tr>
<tr>
<td>14:30</td>
<td>A Human-Like Trajectory Planning Method by Learning from Naturalistic Driving Data</td>
</tr>
<tr>
<td>14:50</td>
<td>Combining Homotopy Methods and Numerical Optimal Control to Solve Motion Planning Problems</td>
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<tr>
<td>15:10</td>
<td>Online Adaptive Covariance Estimation Approach for Multiple Odometry Sensors Fusion</td>
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### Poster Sessions

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<td>16:00 - 18:00</td>
<td>Eco-Driving and Energy-Efficient Vehicles</td>
<td>TianHua Hall</td>
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<td>Object Detection and Recognition-2</td>
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<td>Object Tracking</td>
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<td></td>
<td>Trajectory Planning, Prediction and Optimization-1</td>
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<td>Trajectory Planning, Prediction and Optimization-2</td>
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<td>Sensor Fusion and Applications</td>
<td>RenHe Hall 2</td>
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<td>Mapping and Localization-1</td>
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<td>Mapping and Localization-3</td>
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<td>LiDAR Sensing and Navigation</td>
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<td>Object Detection and Recognition-1</td>
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<td>16:00 - 18:00</td>
<td>Fully Actuated Drive-By-Wire Electric Vehicles</td>
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<td>The Special Used Unmanned Ground Vehicle in China</td>
<td>LongLiQi Hall</td>
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<td>Intelligent Vehicle Motion Control and Safety</td>
<td>BoSiDeng Hall</td>
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<td>Simulation and Navigation for Intelligent Vehicles</td>
<td>FangTa Hall</td>
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Oral Sessions
2018.06.27 (Wednesday)

WeOSAT2 Conference Center
Vision Sensing and Perception

Paper WeOSAT2.1 10:20–10:40
Towards End-To-End Lane Detection: An Instance Segmentation Approach
Neven, Davy  KU Leuven
De Brabandere, Bert  KU Leuven
Georgouts, Stamatios  KU Leuven
Proesmans, Marc  KU Leuven
Van Gool, Luc S. J.  ETH Zurich

Paper WeOSAT2.2 10:40–11:00
Box2Pix: Single-Shot Instance Segmentation by Assigning Pixels to Object Bvnones
Uhrig, Jonas  Daimler AG and Univ. of Freiburg
Rehder, Eike  Daimler AG
Frosche, Bjoern  Daimler AG
Franke, Uwe  Daimler AG
Brox, Thomas  Univ. of Freiburg

Paper WeOSAT2.3 11:00–11:20
Real-Time Semantic Segmentation-Based Depth Upsampling Using Deep Learning
Micka, Vlad  Tech. Univ. of Cluj-Napoca
Nadecky, Sargiu  Tech. Univ. of Cluj-Napoca

Paper WeOSAT2.4 11:20–11:40
Probabilistic Prediction of Vehicle Semantic Intention and Motion
Yaping, Hu  Univ. of California, Berkeley
Wei, Zhen  Univ. of California, Berkeley
Tomizuka, Masayoshi  Univ. of California, Berkeley

Paper WeOSAT2.5 11:40–12:00
Accurate Localization in Underground Garages Via Cylinder Feature Based Map Matching
Zhongxing, Tao  Xi’an Jiaotong Univ.
Jannu, Xue  Xi’an Jiaotong Univ.
Di, Wang  Xi’an Jiaotong Univ.
Shuyang, Zheng  The School of Electronic and Information Engineering, Xi’an Jiaotong Univ.
Daxiao, Cui  Xi’an Jiaotong Univ.
Shaoyi, Du  Xi’an Jiaotong Univ.

WeOSBT2 Conference Center
Vehicle Motion Planning and Testing

Paper WeOSBT2.1 13:30–13:50
A Graded Offline Evaluation Framework for Intelligent Vehicle’s Cognitive Ability
Chi, Zhang  Inst. of Artificial Intelligence and Robotics, Xian Jiaotong
Yuehu, Liu  Inst. of Artificial Intelligence and Robotics, Xian Jiaotong
Qin, Zhang  HERE Tech, Chicago, Illinois
Le, Wang  Xi’an Jiaotong Univ.

Paper WeOSBT2.2 13:50–14:10
From G2 to G3 Continuity: Continuous Curvature Rate Steering Functions for Sampling-Based Nonholonomic Motion Planning
Banzhaf, Holger  Robert Bosch GmbH
Rahardja, Dennis  Robert Bosch GmbH
Zohner, J. Markus  FZI Res. Center for Information Tech. Karlsruhe
Berianpanathan, Nijanthan  ETH Zurich

Paper WeOSBT2.3 14:10–14:30
Cooperative Lane Change Motion Planning of Connected and Automated Vehicles: A Stepwise Computational Framework
Bai, Li  Zhejiang Lab
Yue, Zhang  Center for Information and Systems Engineering, Boston Univ
Youmin, Zhang  Xian Univ. of Tech
Ning, Jia  Tianjin Univ.

Paper WeOSBT2.4 14:30–14:50
A Human-Like Trajectory Planning Method by Learning from Naturalistic Driving Data
Xu, He  Peking Univ.
Donghao, Xu  Peking Univ.
Huang, Zhao  Peking Univ.
Mao, Mathieu  PSA Peugeot Citroen, Valby, France
Alou, Francois  PSA Peugeot Citroen, Valby, France
Guilmard, Franck  PSA Peugeot Citroen, Valby, France

Paper WeOSBT2.5 14:50–15:10
Combining Homotopy Methods and Numerical Optimal Control to Solve Motion Planning Problems
Kristoffer, Bergman  Linköping Univ. Div.of Automatic Control
Avedh, Daniel  Linköping Univ.
### Poster Sessions

**2018.06.27 (Wednesday)**

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<th>WePS-SST3</th>
<th>TianHua Hall</th>
<th>Eco-Driving and Energy-Efficient Vehicles</th>
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<tr>
<td>Paper WePS-SST3.1</td>
<td>16:00-18:00</td>
<td>Optimization of Speed Profile and Energy Interaction at Statoins for a Train with On-Board Energy Storage Device</td>
</tr>
<tr>
<td>Chaoxian, Wu</td>
<td>Xian Jiaotong-Liverpool Univ. China and Univ. of Lü</td>
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<tr>
<td>Shaozheng, Lu</td>
<td>Xian Jiaotong-Liverpool Univ.</td>
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<tr>
<td>Fei, Xue</td>
<td>Xian Jiaotong-Liverpool Univ.</td>
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<td>Lin, Jiang</td>
<td>Xian Jiaotong-Liverpool Univ.</td>
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<tr>
<td>Jie, Yang</td>
<td>Beijing Jiaotong Univ. and Jiangsu Univ. of Science An</td>
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</tr>
</tbody>
</table>

| Paper WePS-SST3.2  | 16:00-18:00 | GS1 Connected Car: An Integrated Vehicle Information Platform and Its Ecosystem for Connected Car Services Based on GS1 Standards |
| Jinyong, Han | KAIST | |
| Kim, Hyunseob | KAIST | |
| Heo, Sehyoon | KAIST | |
| Lee, Naiyung | KAIST | |
| Kang, Daeyoung | Naver Corp | |
| Ohr, Gyangpan | KAIST | |
| Kim, Kyung-Tae | Hyundai Autran | |
| Yoon, Wananuk | KAIST | |
| Byun, Jeawook | KAIST | |
| Kim, Daeyoung | KAIST | |

| Paper WePS-SST3.3  | 16:00-18:00 | Adaptive Anti-Slip Regulation Method for Electric Vehicle with In-Wheel Motors Considering the Road Slope |
| Bin, Li | Tongji Univ. | |
| Xiong, Lu | Tongji Univ. | |
| Shi, Lian | Tongji Univ. | |

| Paper WePS-SST3.4  | 16:00-18:00 | Pollutant Emissions Estimation Framework for Real-Driving Emissions at Microscopic Scale and Environmental Footprint Calculation |
| Sabiron, Gilles | IFP Energies Nouvelles | |
| Thibault, Laurent | IFPEN | |
| Degailh, Philippe | IFPEN | |
| Corde, Gilles | IFPEN | |

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<th>Object Detection and Recognition-2</th>
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<td>Object Modeling from 3D Point Cloud Data for Self-Driving Vehicles</td>
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<td>Azam, Shaabi</td>
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<td>Jason, Moongu</td>
<td>GIST</td>
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| Paper WePS-SST9.5  | 16:00-18:00 | An Orientation Corrected Bounding Box Fit Based on the Convex Hull Under Real Time Constraints |
| Naujoks, Benjamin | Univ. of the Bundeswahr Munich | |
| Wuanshe, Hans Joachim Jee | Univ. of Bayerische Muenchen | |

| Paper WePS-SST9.6  | 16:00-18:00 | A Survey of Anomaly Detection for Connected Vehicle Cybersecurity and Safety |
| Sabiron, Gilles | IFP Energies Nouvelles | |
| Thibault, Laurent | IFPEN | |
| Degailh, Philippe | IFPEN | |
| Corde, Gilles | IFPEN | |
| Sabiron, Gilles | IFP Energies Nouvelles | |
| Thibault, Laurent | IFPEN | |
| Degailh, Philippe | IFPEN | |
| Corde, Gilles | IFPEN | |

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<td>Paper WePS-SST10.1</td>
<td>16:00-18:00</td>
<td>Offline Object Extraction from Dynamic Occupancy Grid Map Sequences</td>
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<td>Stumper, Daniel</td>
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<td>Dettmer, Klaus</td>
<td>Ulm Univ.</td>
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| Paper WePS-SST9.2  | 16:00-18:00 | Leveraging Object Proposals for Object-Level Change Detection |
| Sugimoto, Takuma | Univ. of Fukui | |
| Tanaka, Kenji | Univ. of Fukui | |
| Yamaguchi, Kousuke | Univ. of Fukui | |

| Paper WePS-SST10.3  | 16:00-18:00 | A State Machine-Based Multi-Vehicle Tracking Framework with Dual-Range Radars |
| Lim, Hwan | Honda Res. Inst. | |
| Litch, Ma | Honda Res. Inst. | |

| Paper WePS-SST10.4  | 16:00-18:00 | Real-Time Detection, Tracking, and Classification of Moving and Stationary Objects Using Multiple Fish-eye Images |
| BAEK, IL-JOO | Carnegie Mellon Univ. | |
| Dawies, Albert | Carnegie Mellon Univ. | |
| Geng, Yan | Carnegie Mellon Univ. | |
| Rajkumar, R. | Carnegie Mellon Univ. | |

| Paper WePS-SST10.5  | 16:00-18:00 | Millimeter Wave Radar Target Tracking Based on Adaptive Kalman Filter |
| Guozhao, Zhai | Soochow Univ. | |
| Chang, Wu | Soochow Univ. | |
| Yiming, Wang | Soochow Univ. | |

| Paper WePS-SST10.6  | 16:00-18:00 | Monocular Camera-Based 3D Object Tracking Strategy for Autonomous Vehicles |
| Kuramoto, Akihisa | Tokyo Metropolitan Univ. | |
| ALDBAJA, Mohammad | Kanazawa Univ. | |
| Yanzo, Ryo | Kanazawa Univ. | |
| Kameyama, Junya | Sony Semiconductor Solutions Corp | |
| Rajbhandar, Gopi | Blackberry | |
| Malton, Andrew James | Blackberry | |
| Hassan, Ahmed E. | Queen’s Univ. | |

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<td>Paper WePS-SST11.1</td>
<td>16:00-18:00</td>
<td>Real-Time Trajectory Optimization for Autonomous Vehicle Racing Using Sequential Linear Programming</td>
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<td>Kim, Taeyun</td>
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<td>Suganuma, Naoki</td>
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| Paper WePS-SST11.2  | 16:00-18:00 | Road Map Generation for Connected Vehicles and Robotics Using Grid Maps |
| Kim, Kang | KAIST | |
| Yoon, Dae-Sung | KAIST | |

| Paper WePS-SST11.3  | 16:00-18:00 | Towards Risk Minimizing Trajectory Planning in On-Road Scenarios |
| Li, Xiaowei | Tsinghua Univ. | |
| Wei, Xiaoyan | Tsinghua Univ. | |

| Paper WePS-SST11.4  | 16:00-18:00 | Environment Modeling for the Application in Optimal-Based Trajectory Planning |
| Lienke, Christian | TU Dortmund Univ. | |
| Keller, Christian | TU Dortmund Univ. | |
| Grander, Karl-Heinz | Techn. Univ. of Dortmund | |
| Bertram, Torsten | Techn. Univ. of Dortmund | |
Paper WePS-SST11.6 16:00–18:00
Traffic Prediction of Turning Vehicles Based on Intersection Geometry and Observed Vehicles
Kawasaki, Atsushi
Toshiba Corp
Tasaki, Tsuyoshi
Toshiba

Paper WePS-SST11.7 16:00–18:00
An Optimal Control Problem Formulation for Safe Stop Trajectory Planning for Highly Automated Vehicles
Svensson, Lars
KTH, Royal Inst. of Tech
Mässon, Lotta
LAAS-CNRS
Mohran, Navaneet
KTH Royal Inst. of Tech
Ward, Erik
Ward
Feng, Lei
KTH Royal Inst. of Tech
Perneståhl Bränden, Anna
KTH Royal Inst. of Tech
Tonggren, Martin
KTH – Dept. of Machine Design

Paper WePS-SST11.8 16:00–18:00
Decoupled Sampling-Based Velocity Tuning and Motion Planning Method for Multiple Autonomous Vehicles
Mohseni, Fatemeh
Linkoping Univ
Niaieian, Lars
Linkoping Univ

Paper WePS-SST12.3 16:00–18:00
An Approach to Vehicle Trajectory Prediction Using Automatically Generated Traffic Maps
Qureshi, Junjik
Karlsruhe Inst. of Tech
Hodhoo, Hu
FZI Forschungsstanzium Informatik
Wegs, Rascha
Karlsruhe Inst. of Tech
Leuer, Martin
Karlsruhe Inst. of Tech

Paper WePS-SST12.4 16:00–18:00
Vehicle Trajectory Predictor with Gaussian Process Regression in Connected Vehicle Environment
Alkhani, Gholzad
Univ. of Calgary
far, Behrouz
Univ. of Calgary
Fapowaju, Abraham
Univ. of Calgary

Paper WePS-SST12.5 16:00–18:00
Trajectory Optimization for Autonomous Vehicles on Crossroads with Mobile Obstacles
Ricouart, Jean-Baptiste
Univ. De Bordeaux
Victor, Stéphane
Univ. De Bordeaux
Malheiro, Pierre
Univ. De Bordeaux

Paper WePS-SST12.6 16:00–18:00
Optimal Kinematic-Based Trajectory Planning and Tracking Control of Autonomous Ground Vehicles Using the Variational Approach
Majd, Keyvan
Student
Razeghi Jahromi, Mohammad
AAIB Corp. Res. United States (USGRC)
Hornafir, Abolrahim
North Carolina a & T

Paper WePS-SST12.7 16:00–18:00
Trajectory Planning for Autonomous Vehicles in Time-Varying Environments Using Support Vector Machines
Morssal, Mahdi
Linkoping Univ
Askus, Jan
Linkoping Univ
Friske, Eric
Linkoping Univ

Paper WePS-SST12.8 16:00–18:00
Road Infrastructure Indicators for Trajectory Prediction
Rapua, Gaetan
Delft Univ. of Tech
Geiser, Yoris
Delft Univ. of Tech
Jonker, Peter
Delft Univ. of Tech

Paper WePS-SST13.1 16:00–18:00
Self-Validation for Automotive Visual Odometry
Bucsko, Martin
TU Darmstadt
Wilkert, Volker
TU Darmstadt
Schwein, Julian
Tech. Univ. Darmstadt
Adamy, Lars
TU Darmstadt

Paper WePS-SST13.2 16:00–18:00
Fusion of LiDAR and Camera by Scanning in LiDAR Imagery and Imagery-Guided Distillation for Urban Road Detection
Yngst, Gang
Nanjing Univ. of Science and Tech
Shuo, Gu
Nanjing Univ. of Science and Tech
Jian, Yang
Nanjing Univ. of Science and Tech
Akazawa, Joso 6. M.
NICTA
Hui, Kong
Nanjing Univ. of Science and Tech

Paper WePS-SST13.3 16:00–18:00
Sensor Fusion of Intensity and Depth Cues Using the CNN for Semantic Segmentation of Road Scenes
John, Vijay
Toyota Tech. Inst
Makarren, Karunakaran, Varalakshmi
Toyota Tech. Inst
MITA, Sachi
Toyota Tech. Inst
Takahara, Kyoji
Toyota Tech. Inst
Konishi, Masataka
DENSO Corp
 Ishima, Kazuhiro
Nippon Soken Inc
Yuejun, Xu
Toyota Tech. Inst
Oishi, Tomoyuki
DENSO Corp

Paper WePS-SST13.4 16:00–18:00
Leveraging Spatio-Temporal Evidence and Independent Vision Channels to Improve Multi-Sensor Fusion for Vehicle Environmental Perception
Jiwang, Shu
Xiamen Jiaotong Univ.
Wanji, Wang
Xiamen Jiaotong Univ.
Wen, Wang
Xiamen Jiaotong Univ.
Hong, Sun
Xiamen Jiaotong Univ.
Xuguan, Lian
Xiamen Jiaotong Univ.
Jingbing, Xin
Xiamen Jiaotong Univ.
Nanning, Zhang
Xiamen Jiaotong Univ.

Paper WePS-SST13.5 16:00–18:00
A General Reliability-Aware Fusion Concept Using DSTD and Supervised Learning with its Applications in Multi-Sensory Road Estimation
Nguyen, Tran Tuan
Volkswagen Group
Spahr, Jens
Volkswagen Group
Voock, Dominik
Volkswagen Group
Baum, Marcus
Univ. of Gottingen
Zug, Sebastian
Otto-Von-Guericke Univ.
Magdeburg
Kruse, Rudolf
Otto-Von-Guericke Univ.
Magdeburg

Paper WePS-SST13.6 16:00–18:00
Infrastructure Based Calibration of a Multi-Camera and Multi-LiDAR System Using Apritages
Yuanfan, Xie
Beida
Rui, Shao
Beida.com Times Tech. (Beijing) Co., Ltd
Bo, Li
TrunkTech
Li, Wang
Beida USA

Paper WePS-SST13.7 16:00–18:00
Analysis of Real World Sensor Behavior for Rising Fidelity of Physically Based LiDAR Sensor Models
Rogenhofer, Philipp
Tech. Univ. Darmstadt
Höcker, Martin Friedrich
Tech. Univ. Darmstadt
Winner, Hermann
Tech. Univ. Darmstadt
Zinkin, Marina
Tech. Univ. Darmstadt

Paper WePS-SST13.8 16:00–18:00
Improved Localization Using Visual Features and Maps for Autonomous Cars
Jasmin Rangan, Sathiya Narayanan
NIO
Yalla, Venkagnanesh
NIO
Racchet, Davide
NIO
Donni, Isabella
NIO

Paper WePS-SST14.1 16:00–18:00
End-To-End Steering Controller with CNN-Based Closed-Loop Feedback for Autonomous Vehicles
Jhung, Junyuk
Yonsei Univ.
Bae, Il
Yonsei Univ.
Moon, Jaeyoung
Yonsei Univ.
Kim, Taewoo
Yonsei Univ.
Kim, Jinho
SK Telecom
Kim, Shin
Yonsei Univ

Paper WePS-SST14.2 16:00–18:00
Improved Localization Using Visual Features and Maps for Autonomous Cars
Jasmin Rangan, Sathiya Narayanan
NIO
Yalla, Venkagnanesh
NIO
Racchet, Davide
NIO
Donni, Isabella
NIO

Paper WePS-SST14.3 16:00–18:00
An Experimental Study on Relative and Absolute Pose Graph Fusion for Vehicle Localization
Des, Anweshan
Eindhoven Univ. of Tech
Dubbeltman, Gis
Eindhoven Univ. of Tech

Paper WePS-SST14.4 16:00–18:00
Vision-Based Semantic Mapping and Localization for Autonomous Indoor Parking
Wenxiu, Wang
Xi'an Jiaotong Univ.
Dixiao, Cui
Xi'an Jiaotong Univ.
Jianru, Xue
Xi'an Jiaotong Univ.
Jianwei, Gong
Beijing Inst. of Tech
Huijun, Di
Beijing Inst. of Tech
Feuerhake, Udo
Leibniz Univ. Hannover
Schlichting, Alexander
Leibniz Univ. Hannover

Paper WePS-SST15.2 16:00–18:00
LIDAR Based Altitude Estimation for Autonomous Vehicles
Ishida, Tatsuhiko
Toshiba Corp
Hiraoka, Yutaka
Toshiba Corp
Kawasaki, Atsushi
Toshiba Corp
Watanabe, Masahiro
Toshiba Corp

Paper WePS-SST15.1 16:00–18:00
Mapping and Localization-3
Kawasaki, Atsushi
Toshiba Corp
Tasaki, Tsuyoshi
Toshiba

Paper WePS-SST15.3 16:00–18:00
Mapping and Localization-2
Kawasaki, Atsushi
Toshiba Corp
Tasaki, Tsuyoshi
Toshiba

Paper WePS-SST15.4 16:00–18:00
Mapping and Localization-1
Kawasaki, Atsushi
Toshiba Corp
Tasaki, Tsuyoshi
Toshiba

Paper WePS-SST15.5 16:00–18:00
Mapping and Localization
Kawasaki, Atsushi
Toshiba Corp
Tasaki, Tsuyoshi
Toshiba
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<th>Authors</th>
<th>Institution</th>
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<td>Paper WePS-SST4.5</td>
<td>Evaluating Location Compliance Approaches for Automated Road Vehicles</td>
<td>Tech. Univ. München</td>
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<td>Paper WePS-SST4.6</td>
<td>CPF-G-SLAM: A Robust Simultaneous Localization and Mapping Based on LiDAR in Off-Road Environment</td>
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<td>Global Vehicle Localization by Sequence Analysis Using LiDAR Features Derived by an Autoencoder</td>
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<td>Real-Time 6D LiDAR SLAM in Large Scale Natural Terrains for UAV</td>
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<td>WePS-SST5.1</td>
<td>Evidential Occupancy Grid Map Augmentation Using Deep Learning</td>
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<td>WePS-SST5.2</td>
<td>A Compact Map Representation for Large-Scale Environments and Localization Method Based on Similarity Measure</td>
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<td>WePS-SST5.3</td>
<td>Map Management for Efficient Long-Term Visual Localization in Outdoor Environments</td>
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<td>WePS-SST5.4</td>
<td>Traffic Mapping for Autonomous Cars</td>
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<td>WePS-SST5.5</td>
<td>Real-Time Omnidirectional Visual SLAM with Semi-Dense Mapping</td>
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<td>Extending Occupancy Grid Mapping for Dynamic Environments</td>
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<td>Evaluation of Digital Map Ability for Vehicle Self-Localization</td>
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<td>A Cooperative Vehicle ego-Localization Application Using V2V Communications with CRL Clustering</td>
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<td>Lidar-Based Altitude Estimation for Autonomous Vehicles Using Elevation Maps</td>
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<td>Precise Point Set Registration Using Point-To-Plane Distance and Comment for Lidar Based Localization</td>
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<td>Reliability Estimation of Vehicle Localization Result</td>
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<td>Evaluation of Methods to Estimate Vehicle Location in Electronic Toll Collection Service with C-ITS</td>
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Learning Urban Navigation Via Value Iteration Network
Shu, Yang Beijing Univ. of Posts and Telecommunications
Jinglin, Li Beijing Univ. of Posts and Telecommunications
Jie, Wang Beijing Univ. of Posts and Telecommunications
Zhihan, Lu Beijing Univ. of Posts and Telecommunications
Fangchun, Yang Beijing Univ. of Posts and Telecommunications

Paper WePS-SST7.8  16:00–19:00
Autonomous Urban Localization and Navigation with Limited Information
Chen, Jordan Cornell Univ.
Campbell, Mark Cornell Univ.

Paper WePS-SST7.9  16:00–19:00
Navigating Automated Vehicle through Expressway Toll Gate
Xuesong, Mao Wuhan Univ. of Science and Tech
Yuyuan, Xu Toyota Tech. Inst
MITA, Selchi Toyota Tech. Inst
Chen, Hakucho DENSO Corp
Teerahi Nik Nejad, Hossein DENSO Corp

WePS-SST8  TianHua Hall
Object Detection and Recognition–1

Rui, Guo Toyota InfoTechnology Center USA
Qasimuman, Shalini Toyota InfoTechnology Center USA
Oguchi, Kanete Toyota ITC

Paper WePS-SST8.5  16:00–18:00
Efficient Rectangle Fitting of Sparse Laser Data for Robust On-Road Object Detection
Shuai, Yang Xiamen Jiaotong Univ.
Zhaohong, Xiang Xiamen Jiaotong Univ.
Jin, Xiang Xiamen Jiaotong Univ.
Xiao, Wang Xiamen Jiaotong Univ.
Hongbin, Sun Xiamen Jiaotong Univ.
Jingmin, Xin Xiamen Jiaotong Univ.
Naiming, Zhang Xiamen Jiaotong Univ.

Paper WePS-SST8.6  16:00–18:00
A Fusion of a Monocular Camera and Vehicle-To-Vehicle Communication for Vehicle Tracking: An Experimental Study
Toktal, Mustafa Galateassery Univ
Yaman, Celal Galateassery Univ
Acarmam, Tarkan Galateassery Univ
Akin, Murat Galateassery Univ

Paper WePS-SST8.7  16:00–18:00
Object Recognition from Very Few Training Examples for Enhancing Bicycle Maps
Reinders, Christoph Leibniz Univ. Hannover
Ackermann, Hannn Leibniz Univ. Hannover
Yang, Michael Ying Univ. of Twente
Rosenhardt, Bodo Leibniz Univ. Hannover

Paper WePS-SST8.8  16:00–18:00
On-Road Object Detection
Efficient Rectangle Fitting of Sparse Laser Data for Robust On-Road Object Detection
Tekkal, Mustafa Galateassery Univ
Yaman, Celal Galateassery Univ
Acarmam, Tarkan Galateassery Univ
Akin, Murat Galateassery Univ

Paper WePS-SST8.9  16:00–18:00
Object Detection Using a Single Extended Feature Map
Lim, Young-Chul Daegu Gyeongbuk Inst. of S&T
Minsung, Kang Daegu Gyeongbuk Inst. of S&T

Paper WePS-SST8.10  16:00–18:00
Object Detection on Dynamic Occupancy Grid Maps Using Deep Learning and Automatic Label Generation
Hoermann, Stefan Ulm Univ.
Herdr, Philipp Ulm Univ.
Bach, Martin Ulm Univ.
Dietmayer, Klaus Ulm Univ.

Paper WePS-SST8.11  16:00–18:00
Fusing Bird’s Eye View LiDAR Point Cloud and Front View Camera Image for 3D Object Detection
Zheng, Wang Univ. of California Berkeley
Wei, Zhan Univ. of California Berkeley
Tomizuka, Masayoshi Univ. of California at Berkeley

Paper WePS-SST8.12  16:00–18:00
Simultaneous Object Detection and Association in Connected Vehicle Platform

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Special Sessions
2018.06.27 (Wednesday)

WePS–SST14  ZhaoWen Hall
Fully Actuated Drive-By-Wire Electric Vehicles

Paper WePS-SST14.1  16:00–18:00
Path Tracking of Full Drive-By-Wire Electric Vehicle Based on Model Prediction Control
Bing, Zheng Jilin Univ.
Guxiang, Chen Jilin Univ.
Zhang, Hongxi State Key Lab. of Automotive Simulation and Control, Jilin

WePS–SST15  LongLiQi Hall
The Special Used Unmanned Ground Vehicle in China

Paper WePS-SST15.1  16:00–18:00
Autonomous Driving System Design for Formula Student Driverless Racecar
Hongming, Tian Beijing Inst. of Tech
Jun, Ni Beijing Inst. of Tech
Jin, Hu Beijing Inst. of Tech

Paper WePS-SST15.2  16:00–18:00
Research on Independent Driving Electric Vehicle in the Pivot Steering and Experimental Validation
Yue, Zhao Beijing Inst. of Tech
Jun, Ni Beijing Inst. of Tech
Jin, Hu Beijing Inst. of Tech

Paper WePS-SST15.3  16:00–18:00
Robust H∞ Handling Stability Control for All-Wheel Independent Steering Vehicle with Time Delay
Naiji, Zhang Beijing Inst. of Tech
Jun, Ni Beijing Inst. of Tech
Jin, Hu Beijing Inst. of Tech

WePS–SST16  BoSiDeng Hall
Intelligent Vehicle Motion Control and Safety

Paper WePS-SST16.1  16:00–18:00
Fuzzy Steering Assistance Control for Path Following of the Steer-By-Wire Vehicle Considering Characteristics of Human Driver
Mingming, Dai Southeast Univ.
Jinxing, Wang Southeast Univ.

WePS–SST17  FangTa Hall
Simulation and Navigation for Intelligent Vehicle

Nan, Chen Southeast Univ.
Guodong, Yin Southeast Univ.

Paper WePS-SST16.2  16:00–18:00
Multi-Module Range Anxiety Reduction Scheme for Battery-Powered Vehicles
Fars, Mahmoud Univ. of Waterloo
Fidan, Bars Univ. of Waterloo
Saeed, Vincent Univ. of Waterloo

Paper WePS-SST16.3  16:00–18:00
Task Period Selection for Engagement Control of Automatic Clutches
Xiaoqian, Cheng Shanghai JiaoTong Univ.
Cheng, Zheng Shanghai JiaoTong Univ.
Li, Chen Shanghai JiaoTong Univ.
### Keynote

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<td>08:30 - 09:15</td>
<td>Jack Weast</td>
<td>An Open, Transparent, Industry-Driven Approach to AV Safety</td>
<td>Conference Center</td>
<td>Dr. Li Li</td>
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<tr>
<td>09:15 - 10:00</td>
<td>Gill Pratt</td>
<td>The Multiple Motivations, Approaches, and Benefits of Automated Driving Technology for China and the World</td>
<td>Conference Center</td>
<td>Dr. Li Li</td>
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### Oral Sessions A: Advanced Driver Assistance Systems

**Location:** Conference Center

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<td>10:40 - 11:00</td>
<td>Rendering Physically Correct Raindrops on Windshields for Robustness Verification of Camera-Based Object Recognition</td>
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<td>11:00 - 11:20</td>
<td>Optimizing Vehicle Motion Control for Generating Multiple Sensations</td>
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<td>11:20 - 11:40</td>
<td>Generic Vehicle Tracking Framework Capable of Handling Occlusions Based on Modified Mixture Particle Filter</td>
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<tr>
<td>11:40 - 12:00</td>
<td>Courtesy Behavior for Highly Automated Vehicles on Highway Interchanges</td>
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### Oral Sessions B: Mapping and Localization

**Location:** Conference Center

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<tr>
<th>Time</th>
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<tr>
<td>13:50 - 14:10</td>
<td>CNN-Based Multi-Frame IMO Detection from a Monocular Camera</td>
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<tr>
<td>14:10 - 14:30</td>
<td>Dense 3D Semantic SLAM of Traffic Environment Based on Stereo Vision</td>
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<tr>
<td>14:30 - 14:50</td>
<td>Vehicle Localization Using 76GHz Omnidirectional Millimeter-Wave Radar for Winter Automated Driving</td>
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<tr>
<td>14:50 - 15:10</td>
<td>Planecell: Representing Structural Space with Plane Elements</td>
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<tr>
<td>15:10 - 15:30</td>
<td>Infrastructure Enabled Autonomy: A Distributed Intelligence Architecture for Autonomous Vehicles</td>
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### Poster Sessions

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<td>16:00 - 18:00</td>
<td>Semantic Segmentation &amp; Autonomous Driving</td>
<td>RenHe Hall 1</td>
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<td>Vehicular Communication and Networks-1</td>
<td>TianHua Hall</td>
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<td>Vehicular Communication and Networks-2</td>
<td>TianHua Hall</td>
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<td></td>
<td>Motion Recognition, Planning and Routing</td>
<td>TianHua Hall</td>
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<td></td>
<td>Traffic Sign Classification</td>
<td>TianHua Hall</td>
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<td></td>
<td>Reinforcement Learning for Vehicles</td>
<td>RenHe Hall 1</td>
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<td>Pedestrian Motion and Intention Classification</td>
<td>RenHe Hall 1</td>
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<td>Collision Avoidance and Encounter</td>
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<td>Lane Merging and Change Prediction</td>
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<td>Lane and Road Detection</td>
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<td>Traffic Management</td>
<td>RenHe Hall 2</td>
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### Special Sessions

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<tr>
<th>Time</th>
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<td>16:00 - 18:00</td>
<td>CAV Test &amp; Evaluation</td>
<td>ZhaoWen Hall</td>
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<td></td>
<td>Intelligent Electric Vehicle State Estimation and Dynamics Control</td>
<td>LongLiQi Hall</td>
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<td></td>
<td>Parallel-Driving-Based Coérifl Optimization of Intelligent Electrified Vehicles: From CPS to CPSS</td>
<td>BoSiDeng Hall</td>
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Oral Sessions  
2018.06.28 (Thursday)

**ThOSAT2 Conference Center**
Advanced Driver Assistance Systems

**Paper ThOSAT2.1** 10:20–10:40
Learning-Based Multiple-Path Prediction for Early Warning
Sato, Ikuro  Dissan IT Lab., Inc.
Gucang, Liu  Dissan IT Lab., Inc.

**Paper ThOSAT2.2** 10:40–11:00
Rendering Physically Correct Raindrops on Windshields for Robustness Verification of Camera-Based Object Recognition
von Bermuth, Alexander  Eberhard Karls Univ. Tübingen
Volk, Georg  Eberhard Karls Univ. Tübingen
Bingmann, Oliver  Eberhard Karls Univ. Tübingen

**Paper ThOSAT2.3** 11:00–11:20
Optimizing Vehicle Motion Control for Generating Multiple Sensations
Kisse, Marco  Ecole Nationale Superieure Des Tch. Avancées
Mounier, Xavier  Group Renault
Menezes, Didier  Ecole Nationale Superieure Des Tch. Avancées
Tapus, Adrian  Ecole Nationale Superieure Des Tch. Avancées

**Paper ThOSAT2.4** 11:20–11:40
Generic Vehicle Tracking Framework Capable of Handling Occlusions Based on Modified Mixture Particle Filter
Jachter, L.  Univ. of California, Berkeley
Wai, Zhan  Univ. of California, Berkeley
Tomotika, Masayoshi  Univ. of California, Berkeley

**Paper ThOSAT2.5** 11:40–12:00
Courtesy Behavior for Highly Automated Vehicles on Highway Interchanges
Moriones–Romero, Cristina  BMW Group
Sazor, Mustafa  BMW Group
Winkler, Franz  BMW Group
Domínguez, Cristian  Albert–Ludwigs–Univ. Freiburg

**Paper ThOSAT2.6** 13:30–13:50
Autonomous Vehicle Testing and Validation Platform: Integrated Simulation System with Hardware in the Loop
Yu, Chen  Xi’an Jiaotong Univ.
Shi, Bo  Xi’an Jiaotong Univ.
Nannin, Zheng  Xi’an Jiaotong Univ.
Tangnyke, Zheng  Xi’an Jiaotong Univ.
Songyv, Zhang  Xi’an Jiaotong Univ.

**Paper ThOSAT2.7** 13:50–14:10
CNN-Based Multi-Frame IMU Detection from a Monocular Camera
Fanani, Hadiang  Goethe Univ. Frankfurt
Ochs, Matthias  Goethe Univ. Frankfurt
Sturck, Alina  Goethe Univ. Frankfurt
Mester, Rudolf  Goethe Univ. Frankfurt

**Paper ThOSAT2.8** 14:10–14:30
Dense 3D Semantic SLAM of Traffic Environment Based on Stereo Vision
Liu, Li  Dalian Univ. of Tech
Zhao, Li  Dalian Univ. of Tech
Cagunay, Umit  Ohio State Univ.
Jung, Lian  Dalian Univ. of Tech
Yao, Zhou  Dalian Univ. of Tech
Yong, Zhao  Dalian Univ. of Tech

**Paper ThOSAT2.9** 14:30–14:50
Vehicle Localization Using 76GHz Centimetric Radar for Winter Automated Driving
Yoneda, Katsutaka  Kanazawa Univ.
Hachisaki, Naoya  Kanazawa Univ.
Yanase, Ryo  Kanazawa Univ.
Aldbaja, Mohammad  Kanazawa Univ.
Sugiyama, Naoki  Kanazawa Univ.

**Paper ThOSAT2.10** 14:50–15:10
PlanesCell: Representing Structural Space with Plane Elements
Lui, Fan  Sun Yat–Sen Univ.
Long, Chen  Sun Yat–Sen Univ.
Kai, Huang  Sun Yat–Sen Univ.
Dongpu, Cao  Cranfield Univ.

**Paper ThOSAT2.11** 15:10–15:30
Infrastructure Enabled Automation: A Distributed Intelligence Architecture for Autonomous Vehicles
Gopalaswamy, Swaminathan  Texas A&M Univ.
Rathnam, Skrekumar  Texas A&M Univ.

Poster Sessions  
2018.06.28 (Thursday)

**ThPS–SST3 RenHe Hall 1**
Semantic Segmentation & Autonomous Driving

**Paper ThPS–SST3.1** 16:00–18:00
Adaptive Behavior Generation for Autonomous Driving Using Deep Reinforcement Learning with Compact Semantic States
Wolf, Peter  FZI Res. Center for Information Tech
Kurzer, Karl  Karlsruhe Inst. of Tech
Wingert, Tobias  Karlsruhe Inst. of Tech
Kuhnt, Florian  FZI Forschungszentrum Informatic
Züchner, J. Marcus  FZI Res. Center for Information Tech

**Paper ThPS–SST3.2** 16:00–18:00
Road Lane Semantic Segmentation for High Definition Map
Jang, Wonja  Yonsei Univ.
Lui, Jiho  Yonsei Univ.
Lai, Songyun  Yonsei Univ.
Cho, Minho  Hyundai–Mistra
Kim, Eunta  Yonsei Univ.

**Paper ThPS–SST3.3** 16:00–18:00
A Simple Weight Recal for Semantic Segmentation: Application to Urban Scenes
Xuhong, Li  Univ. of Tech, Da Compiègne
Saxena, Franky  CNRS, Univ. De Tech, Da Compiègne
Grandad, Yves  CNRS/UTC

**Paper ThPS–SST3.4** 16:00–18:00
MultiNet: Real–Time Joint Semantic Reasoning for Autonomous Driving
Teichmann, Marvin  Univ. of Cambridge
Webber, Michael  FZI Res. Center for Information Tech
Züchner, J. Marcus  Karlsruhe Inst. of Tech
Opello, Robert  Univ. of Cambridge
Ursenbacher, Raphael  Univ. of Toronto

**Paper ThPS–SST3.5** 16:00–18:00
LiSeg: Lightweight Road-Object Semantic Segmentation in 3D LiDAR Scans for Autonomous Driving
Wangjun, Zhang  Sun Yat–Sen Univ.
Changzheng, Zhou  Sun Yat–Sen Univ.

**Paper ThPS–SST3.6** 16:00–18:00
Althommer, Naf  Durham Univ.
Akiyama, Samet  Durham Univ.
Brocken, Toby  Durham Univ.

**Paper ThPS–SST3.7** 16:00–18:00
Unifying Terrain Awareness through Real–Time Semantic Segmentation
Keikin, Yang  Zhejiang Univ.
Bengtsson, L. M.  Univ. of Alcalá
Romera, Eduardo  Univ. of Alcalá
Rui, Cheng  Zhejiang Univ.
Tieniu, Chen  Univ. of California, Los Angeles
Kanai, Wai  Zhejiang Univ.

**Paper ThPS–SST3.8** 16:00–18:00
CNN-Based Feature Image Real–Time Semantic Segmentation
Sar, Álvaro  Univ. De Alcalá
Bengtsson, L. M.  Univ. of Alcalá
Romera, Eduardo  Univ. of Alcalá
López-Guillén, Elena  Univ. of Alcalá
Barba, Rafael  Univ. of Alcalá
Sanz, Rafael  Univ. of Vigo

**Paper ThPS–SST3.9** 16:00–18:00
Training of Convolutional Networks on Multiple Heterogeneous Datasets for Street Scene Semantic Segmentation
Malet, Patrice  TU Eindhoven
Dubbelman, Gijs Eindhoven  Univ. of Technology

**Paper ThPS–SST3.10** 16:00–18:00
A New Metric for Evaluating Semantic Segmentation: Leveraging Global and Contour Accuracy
Fernández–Morales, Eduardo  INRA
Martins, Raúl  INRA
Wolf, Dani  Univ. of Sao Paulo
Rives, Patrick  INRA–Sophia
The 29th IEEE Intelligent Vehicles Symposium

Vehicular Communication and Networks-1

Paper ThPS-SST9.1  16:00-18:00
CPSS-Based Signal Forwarding Method at Relays for Full-Duplex Cooperative Vehicular Networks

Shuanghui, Han  Inst. of Automation, Chinese Acad. of Sciences
Xiao, Wang  Chinese Acad. of Sciences, Inst. of Automation
Dongping, Cao  Cranfield Univ.
Wang, Fei-Yue  Chinese Acad. of Sciences

Risk Analysis for the Wireless Communication of the High-Speed Maglev under the Cognitive Uncertainties

Wang, Zheng  Jiangxi Univ.
Chen, Stanley  Indiana Univ. Ind. University

A Security Aware Fuzzy Enhanced Reliable Ant Colony Optimization Routing in Vehicular Ad Hoc Networks

Zhang, Hang  Univ. of Goettingen
Bochem, Arne  Univ. of Goettingen
Sun, Xu  Univ. of Goettingen
Hofradler, Dietmar  Univ. of Goettingen

Paper ThPS-SST9.4  16:00-18:00
Towards “Smarter” Vehicles through Cloud-Based Swarm Cognition

Vagea, Augusto  IBM Res
Soykutsoyoglu, Alper  IBM T.J. Watson Res. Center
Bezerra, Prado  IBM T.J. Watson Res. Center

A Realistic Analytical Model for Uplink Drive-Thru Internet Connections

Shanghai, Cao  City Univ. of Hong Kong
Vaid, C.S. Lee  City Univ. of Hong Kong

Paper ThPS-SST9.5  16:00-18:00
A Dual Traffic Network Coupled with Improved Daisy Models to Estimate Travel Time in Urban Traffic Systems

Xiao, Fan  Southwest Univ.
Liang, Yan  Southwest Univ.
Yong, Sun  Southwest Univ.
Zhidian, Fan  Southwest Univ.

ThPS-SST10  TianHua Hall
Vehicular Communication and Networks-2

Paper ThPS-SST10.1  16:00-18:00
Collaborative Perception for Automated Vehicles Leveraging Vehicle-To-Vehicle Communications

Yao, Ryan Matthew  Exponent
Chen, Blick  Exponent
Santaroni, Carmine  Exponent
Bin, Cheng  Toyota Info Technology Center, USA

Paper ThPS-SST10.2  16:00-18:00
LoRa on the Move: Performance Evaluation of LoRa in V2X Communications

Yuka, Li  Chinese Acad. of Sciences
Shuanghui, Han  Inst. of Automation, Chinese Acad. of Sciences
Linyan, Yang  Chinese Acad. of Sciences
Fei-Yue, Wang  Computer Science Department, the School of Computer Science, Car

Enhancing the Performance of Vehicular-To-Vehicle Realtime Video Streaming for Platoons

Ku, Saeho  Korea Univ.
Kim, Hyogon  Korea Univ.
Park, Yongjoo  Korea Univ.

Cooperative Driving Based on Negotiation with Persuasion and Concession

Cheng, Peng  Univ. of California, Berkeley
Tomizuka, Masayoshi  Univ. of California, Berkeley

Paper ThPS-SST10.4  16:00-18:00
Plastic Synchronization for Vehicular Networks

Hui, Cheng-Yu  Univ. of Paris Sud
Novak, Thomas  Univ. of Paris Sud
Lambert, Alan  Univ. of Paris Sud

Integration Challenges of Facilities-Layer DCC for Homogeneous V2X Services

Khan, Mohammad Irfan  Eurocom
Haert, Jerome  Eurocom

ThPS-SST11  TianHua Hall
Motion Recognition, Planning and Routing Poster Session

Paper ThPS-SST11.1  16:00-18:00
Learning a Deep Motion Planning Model for Autonomous Driving

Sheng, Song  Huabei Univ.
Xiaomin, Hu  Huabei Univ.
Jin, Yu  Huabei Univ.
Luyan, Bai  Huabei Univ.
Long, Chen  Sun Yat-Sen Univ.

Paper ThPS-SST11.2  16:00-18:00
Gaussian Process Based Motion Pattern Recognition with Sequential Local Models

Tiger, Matthes  Linkoping Univ.
Heintz, Frankit  Linkoping Univ.

Probabilistic Prediction from Planning Perspectives: Problem Formulation, Representation, Simplification and Evaluation

Wai, Zhan  Univ. of California, Berkeley
de La Fortelle, Arnaud  MINES ParisTech
Yi-Ting, Chen  Honda Res. Inst.
Ching-Yao, Chan  ITS, Univ. of California at Berkeley
Tomizuka, Masayoshi  Univ. of California, Berkeley

Paper ThPS-SST11.3  16:00-18:00
Value Sensitive Design for Autonomous Vehicle Motion Planning

Thomsen, Sarah  Stanford Univ.
Lewis, Francis E.  Stanford Univ.
Wu, Zihan  Stanford Univ.
Kochenderfer, Mykel  Stanford Univ.
Gerdes, J Christian  Stanford Univ.


Zhihao, Luo  National Univ. of Defense Tech
Zhong, Liu  Science and Tech. on Information Systems Engineering Lab
Jianwei, Gong  National Univ. of Defense Tech
Ziyi, Kang  BIT
Guangming, Xiong  Beijing Inst. of Tech
Jianwei, Gong  Beijing Inst. of Tech

Paper ThPS-SST11.5  16:00-18:00
Learning a Deep Motion Planning Model for Autonomous Driving

Tadj, Omar, Sehn  FZI Res. Center for Information Tech
Stiller, Christoph  Karlsruhe Inst. of Tech

Limited Visibility and Uncertainty Aware Motion Planning for Automated Driving

ThPS-SST13  RenHe Hall
Reinforcement Learning for Vehicles

Paper ThPS-SST13.1  16:00-18:00
A Generator-Theoretical Approach to Driving Decision Making in Highway Scenarios

Zhirui, Yan  Tongji Univ.
Jun, Wang  Tongji Univ.
Yunpeng, Zheng  Tongji Univ.

Paper ThPS-SST13.4  16:00-18:00
Adaptive Traffic Signal Control with Deep Recurrent Q-Learning

Jianghong, Zeng  Tsinghua Univ.
Jianming, Hu  Tsinghua Univ.
Yi, Zhang  Tsinghua Univ.

Paper ThPS-SST13.5  16:00-18:00
Benchmarking Deep Learning Frameworks with FPGA-Suitable Models on a Traffic Sign Dataset

Zhu, Dong  Univ. of California San Diego
Tian, Huan  Univ. of California San Diego

Paper ThPS-SST12  TianHua Hall
Traffic Sign Classification

Paper ThPS-SST12.1  16:00-18:00
Multi-Model Trajectory Prediction of Surrounding Vehicles with Maneuver-Based LSTM

Deo, Nachiket  Univ. of California San Diego
Tiwed, Mohan M.  Univ. of California San Diego

Paper ThPS-SST12.2  16:00-18:00
Application Technology Investigation of Traffic Signal Controllers Which Output DC Signal


Paper ThPS-SST12.3  16:00-18:00
Vision-Based Pole-Like Obstacle Detection and Localization for Urban Mobile Robots

Sebas, Stefano  Pol. Di Milano
Cori, Matteo  Pol. Di Milano
Fiorenti, Simone  Yapi Srl
Savarese, Sergio M.  Pol. Di Milano

Paper ThPS-SST12.4  16:00-18:00
Multi-Model Trajectory Prediction of Surrounding Vehicles with Maneuver-Based LSTM

Deo, Nachiket  Univ. of California San Diego
Tiwed, Mohan M.  Univ. of California San Diego

Paper ThPS-SST12.5  16:00-18:00
Benchmarking Deep Learning Frameworks with FPGA-Suitable Models on a Traffic Sign Dataset

Zhu, Dong  Univ. of California San Diego
Tian, Huan  Univ. of California San Diego

Paper ThPS-SST12.6  16:00-18:00
Adaptive Traffic Signal Control with Deep Recurrent Q-Learning

Jianghong, Zeng  Tsinghua Univ.
Jianming, Hu  Tsinghua Univ.
Yi, Zhang  Tsinghua Univ.

Paper ThPS-SST12.7  16:00-18:00
Multi-Model Trajectory Prediction of Surrounding Vehicles with Maneuver-Based LSTM

Deo, Nachiket  Univ. of California San Diego
Tiwed, Mohan M.  Univ. of California San Diego

Paper ThPS-SST13  RenHe Hall
Reinforcement Learning for Vehicles

Paper ThPS-SST13.1  16:00-18:00
A Generator-Theoretical Approach to Driving Decision Making in Highway Scenarios

Zhirui, Yan  Tongji Univ.
Jun, Wang  Tongji Univ.
Yunpeng, Zheng  Tongji Univ.

Paper ThPS-SST13.4  16:00-18:00
Adaptive Traffic Signal Control with Deep Recurrent Q-Learning

Jianghong, Zeng  Tsinghua Univ.
Jianming, Hu  Tsinghua Univ.
Yi, Zhang  Tsinghua Univ.

Paper ThPS-SST13.5  16:00-18:00
Benchmarking Deep Learning Frameworks with FPGA-Suitable Models on a Traffic Sign Dataset

Zhu, Dong  Univ. of California San Diego
Tian, Huan  Univ. of California San Diego
Paper ThPS-SST13.2  16:00-18:00
Highway Traffic Modeling and Decision Making for Autonomous Vehicles Using Reinforcement Learning
Changyu, You   Gtech
Jianbo, Lu     Ford Motor Company
Fleix, Dimetr   Ford Res. & Advanced Engineering
Tsatsias, Pangalos    Georgia Tech

Paper ThPS-SST13.3  16:00-18:00
Automatically Generated Curriculum Based Reinforcement Learning for Autonomous Vehicles in Urban Environment
Zhigang, Qiao    Carnegie Mellon Univ.
Mengdi, Katharina     Carnegie Mellon Univ.
Dorota, John    Carnegie Mellon Univ.
Pantelis, Provian    General Motors
Mudeke, Payal    General Motors

Paper ThPS-SST13.4  16:00-18:00
Deep Hierarchical Reinforcement Learning for Autonomous Driving with Distracted Behaviors
Jianyu, Chen    UC Berkeley
Zining, Wang    Univ. of California Berkeley
Tomoeaki, Masayoshi     Univ. of California at Berkeley

Paper ThPS-SST13.5  16:00-18:00
Inverse Reinforcement Learning Via Neural Network in Driver Behavior Modeling
Qiu, Zou           Dalian Univ.
Haoxiu, Lu        Dalian Univ.
Ruber, Zhang       Dalian Minzu Univ.

ThPS-SST4 RenHe Hall I  Pedestrian Motion and Intention Classification

Paper ThPS-SST4.1  16:00-18:00
Multi-Feature Fusion Based Region of Interest Generation Method for Far-Infrared Pedestrian Detection System
Zhening, Fang    Hefei Inst. of Physical Sciences, Chinese Acad of Sci
Linglong, Lin    Inst. of Applied Tech, Hefei Inst. of Physical Sci
Yuan, Li     Hefei Inst. of Physical Sciences, Chinese Acad of Sci

Paper ThPS-SST4.2  16:00-18:00
Pedestrian Classification for 79 GHz Automotive Radar Systems
Prophet, Robert    FAMU-FSU-Center, Florida State University
Hoffmann, Moritz    FAMU-FSU-Center, Florida State University
Orozcozer, Almog     Active Safety Product Line, Valeo
Mark, Wawas    Schaeffler Udt Sandeman GmbH
Stumm, Christian    Active Safety Product Line, Valeo

Vossiek, Martin    Schaeffler Udt Sandeman GmbH
FAU-Erlangen-Nuremberg, Inst. of Microelectronics and Photonics

Paper ThPS-SST4.3  16:00-18:00
Is the Pedestrian Going to Cross? Answering by 2D Pose Estimation
Fang, Zhijia    Univ. Autònoma De Barcelona
Liu, Zhiyong, Antonio M.     Univ. Autònoma De Barcelona

Paper ThPS-SST4.4  16:00-18:00
Learning to Forecast Pedestrian Intention from Pose Dynamics
Ghor, Omar    Robert Bosch GmbH
Mackovjak, Rakel, Jakob    Robert Bosch GmbH
Bautista, Miguel    Hadaberg Univer
Bauer, Niklas    Robert Bosch GmbH
Ragot Dummond, Lucas    Robert Bosch GmbH
Deigo, Feimin    Bosch
Omerme, Bjorn    Hadaberg Univer, MVR

Paper ThPS-SST4.5  16:00-18:00
Probabilistic Map-Based Pedestrian Motion Prediction Taking Traffic Participants into Consideration
Liangyuan, Wu    Robert Bosch GmbH
Ruan, Johannes    Robert Bosch GmbH
Atthoff, Matthias    Tech. Univ. München

Paper ThPS-SST4.6  16:00-18:00
Skeleton Model Based Behavior Recognition for Pedestrians and Cyclists from Vehicle Static Camera
Qian, Qing    Indiana Univ. Purdue Univ. Indianapolis
Ranran, Tian    Indiana Univ. Purdue Univ. Indianapolis
Yaobin, Chen    Purdue School of Engineering and Tech. IPUI

Kang, Li     Rutgers Univ.

Paper ThPS-SST4.7  16:00-18:00
Pedestrian Dynamic and Kinematic Information Obtained from Vision Sensors
GELING KONRAD, Santiago    Univ. Nacional Del Sur
Shan, Hao    Univ. of Sydney
Monson, Fabrici    Univ. Nacional Del Sur
Worrall, Stewart    Univ. of Sydney
Nabza, Eduardo    ACRF Univ.of Sydney

Paper ThPS-SST4.8  16:00-18:00
Motorcycle Inertial Parameters Identification Via Algorithmic Computation of State and Design Sensitivities
Ivania, ibani    IBSC Lab
Anuol, Hicham    Every Via Researches Unive
Mammar, Said    Univ. EVRY

Paper ThPS-SST5 RenHe Hall II  Collision Avoidance and Encounter

Paper ThPS-SST5.1  16:00-18:00
A Virtual Reality Based Approach for Researching Pedestrian for Vehicle Collisions
Hodig, Thomas    Tech. Hochschule Ingolstadt, CARSSPA
Dorc, Igor    Tech. Hochschule Ingolstadt
Fuchs, Theresa    Univ. of Munich, LMU
Muehlebauer, Julia    Univ. of Munich, LMU
Stanfill, Philipp    Univ. of Munich, LMU
Ratclis, Stefan    Univ. of Munich, LMU
Blankenhoff, Thomas Ingolstadt    Univ. of Applied Sciences

Paper ThPS-SST5.2  16:00-18:00
Automatic Generation of Safety-Critical Test Scenarios for Collision Avoidance of Road Vehicles
Atthoff, Matthias    Tech. Univ. München
Lutz, Sebastian    Tech. Univ. München

Paper ThPS-SST5.3  16:00-18:00
Effect of Vehicle-To-Vehicle Communication Latency on a Collision Avoidance Algorithm for Heavy Road Vehicles
Valliant, Andrea    Technische Universität München
Yelken, Rinsin N    Technische Universität München
Subramaniam, Shankar    Indian Inst. of Tech. Madras

Paper ThPS-SST5.4  16:00-18:00
A Linear Model Predictive Planning Approach for Overtaking Maneuvers under Possible Collision Circumstances
Lattan, Roy    Technische Univ. & Innovation
Hoss, Daniel    Technische Zentrum für Luft und Raumfahrt e.V
Prerez Rezaoli, Joshu       Technische Zentrum für Luft

Paper ThPS-SST5.5  16:00-18:00
Cooperative Collision Avoidance by Sharing Vehicular Subsystem Data
yawan, Chaitanya    George Mason Univ.
Duc, Zoran    George Mason Univ.
Wajsakera, Durinda    George Mason Univ.

Paper ThPS-SST5.6  16:00-18:00
Cluster Naturalistic Driving Encounters Using Deep Unsupervised Learning
Still, Lu     Univ. of Michigan
Wenju, Wang    Univ. of Michigan
Zhao, Mo    Tsinghua Univ.
Ding, Zhao    Univ. of Michigan, Ann Arbor

Paper ThPS-SST5.7  16:00-18:00
Narain, Weng    Fults Labs of America
XJ, Wang    Fults Labs of America
Patelchand, Papareo    Fults Labs of America
Ikeda, Tadashi    Fults Labs of America, Inc

Paper ThPS-SST5.8  16:00-18:00
Adapting the Virtual Platooning Concept to Roundabout Crossing
Moo, Stefan   Univ. De Tech Da Complé gne
Xu, Philippe    Univ. of Tech. de Compiegne
BIONIFALT, Philippe    Univ. of Tech. de Compiegne

Paper ThPS-SST5.9  16:00-18:00
Estimating Reaction Time in Adaptive Cruise Control Systems
Markides, Michail    Joint Res. Centre, European Commission
Matthis, Konstantinos    Joint Res. Centre, European Commission
Bono, Daniele    Joint Res. Centre, European Commission
Gaulini, Raimondo    Joint Res. Centre, European Commission
Cuffo, Baggio    Joint Res. Centre, European Commission

ThPS-SST6 RenHe Hall II  Lane Merging and Change Predi

Paper ThPS-SST6.1  16:00-18:00
A Reinforcement Learning Based Approach for Automated Lane Change Maneuvers
Pin, Wang    Univ. of California, Berkeley
Chang-Yao, Chen    ITS, Univ. of California at Berkeley
De La Porte, Arnaud    MINES Paristech

Paper ThPS-SST6.2  16:00-18:00
Learning to Predict Lane Changes in Highway Scenarios Using Dynamic Filters on a Generic Traffic Representation
Mattei, Joostan    KTH Royal Inst. of Tech
Folkesson, John    KTH Royal Inst. of Tech
Ward, Erik    KTH Royal Inst. of Tech

Paper ThPS-SST6.3  16:00-18:00
Naturalistic Lane Change Analysis for Human-Like Trajectory Generation
Donghao, Xu    Sookmyung Women's Univ.
Pengpeng, Wang    George Mason Univ.
Zhao, Xiaojun    George Mason Univ.
Yang, Zihan    George Mason Univ.

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Special Sessions
2018.06.28 (Thursday)

ThPS-SST14  ZhaoWen Hall
CAV Test & Evaluation

Paper ThPS-SST14.1  16:00–18:00
An Augmented Reality Environment for Connected and Automated Vehicle Testing and Evaluation
Yiheng, Feng  Univ. of Michigan
Chunhui, Yu  Tongji Univ.
Shuangxi, Xu  Univ. of Michigan, Ann Arbor
Hao, Xun  Univ. of Michigan

Paper ThPS-SST14.2  16:00–18:00
Simulation-Based Adversarial Test Generation for Autonomous Vehicles with Machine Learning Components
Tuncali, Cumhur Erkan  Arizona State Univ.
Fainekos, Georgios  Arizona State Univ.
Ito, Hisahiro  Toyota Motor North America
Kapinski, James  Toyota Motor North America

ThPS-SST15  LongLiQi Hall
Intelligent Electric Vehicle State Estimation and Dynamics Control

Paper ThPS-SST15.1  16:00–18:00
Automated Vehicle Attitude and Lateral Velocity Estimation Using a 6-D IMU Aided by Vehicle Dynamics
Xin, Xia  School of Automotive Studies, Tongji Univ.
Xiong, Lu  Tongji Univ.
Wei, Liu  Tongji Univ.
Zhuoping, Yu  Tongji Univ.

Paper ThPS-SST15.2  16:00–18:00
Research on Modeling of Distributed Compound Braking System and Braking Force Allocation Strategy
Jun, Yao  State Key Lab. of Automotive Simulation and Control, Jilin Univ.
Gucying, Chen  Jilin Univ.
Changfu, Zong  State Key Lab. of Automotive Simulation and Control, Jilin Univ.
Yachun, Guo  Zhengzhou Yutong Bus Co. Ltd

Paper ThPS-SST15.3  16:00–18:00
State of Charge Estimation Based on State of Health Correction for Lithium-Ion Batteries
Yiduo, Zhu  Wuhan Univ. of Tech
Fuwu, Yan  Wuhan Univ. of Tech
Jiangang, Kong  Wuhan Univ. of Tech
Changqing, Du  Wuhan Univ. of Tech

Paper ThPS-SST15.4  16:00–18:00
Intelligent Vehicle Sidestep Angle Estimation Considering Measurement Signal Delay
Wei, Lu  Tongji Univ.
Xiong, Lu  Tongji Univ.
Xin, Xia  School of Automotive Studies, Tongji Univ.
Zhuoping, Yu  Tongji Univ.

Paper ThPS-SST15.5  16:00–18:00
Tire-Model-Free Control for Steering of Skid Stearing Vehicle
Haolan, Meng  Tongji Univ.
Xiong, Lu  Tongji Univ.
Letian, Gao  Tongji Univ.
Zhuoping, Yu  Tongji Univ.
Renxie, Zhang  Tongji Univ.

ThPS-SST16  BoSiDeng Hall
Parallel-Driving-Based Control Optimization of Intelligent Electrified Vehicles: From CPS to CPSS

Paper ThPS-SST16.1  16:00–18:00
A Novel Control Framework of Haptic Take-Over System for Automated Vehicles
Chen, Lv  Cranfield Univ.
Hai, Wang  Cranfield Univ.
Dongpu, Cao  Cranfield Univ.
Yifan, Zhao  Cranfield Univ.
Suhail, Mark  Cranfield Univ.
Auger, Daniel  Cranfield Univ.
Brighton, James  Cranfield Univ.
Matthews, Rebecca  Jaguar Land Rover
Skrychuk, Lee  Jaguar Land Rover
Mouzakitis, Alexandros  Jaguar Land Rover
### Keynote

<table>
<thead>
<tr>
<th>Time</th>
<th>Name</th>
<th>Title</th>
<th>Location</th>
<th>Host</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:30 - 09:15</td>
<td>Xiaodong Zhang</td>
<td>Research and Technology Innovation of Intelligent Electrified Passenger Vehicles: Geely's Strategy and Vision</td>
<td>Conference Center</td>
<td>Dr. Dongpu Cao</td>
</tr>
<tr>
<td>09:15 - 10:00</td>
<td>Ljubo Vlacic</td>
<td>Are you ready to take over?</td>
<td>Conference Center</td>
<td>Dr. Dongpu Cao</td>
</tr>
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### Oral Sessions A: Sensor and Data Fusion

**Location:** Conference Center

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
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<tbody>
<tr>
<td>10:20 - 10:40</td>
<td>A Speed Guide Model for Collision Avoidance in Non-Signalized Intersections Based on Reduplicate Game Theory</td>
</tr>
<tr>
<td>10:40 - 11:00</td>
<td>Robust Camera Lidar Sensor Fusion Via Deep Gated Information Fusion Network</td>
</tr>
<tr>
<td>11:00 - 11:20</td>
<td>End-To-End Driving Activities and Secondary Tasks Recognition Using Deep Convolutional Neural Network and Transfer Learning (I)</td>
</tr>
<tr>
<td>11:20 - 11:40</td>
<td>Online Camera LiDAR Fusion and Object Detection on Hybrid Data for Autonomous Driving</td>
</tr>
<tr>
<td>11:40 - 12:00</td>
<td>Predicting Trajectories of Vehicles Using Large-Scale Motion Priors</td>
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### Oral Sessions B: Decision and Control

**Location:** Conference Center

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<thead>
<tr>
<th>Time</th>
<th>Title</th>
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<tbody>
<tr>
<td>13:50 - 14:10</td>
<td>Continuous Decision Making for On-Road Autonomous Driving under Uncertain and Interactive Environments</td>
</tr>
<tr>
<td>14:10 - 14:30</td>
<td>Turn-By-Turn Intelligent Manoeuvring of Driverless Taxi: A Recursive Value Model Enhanced by Reinforcement Learning</td>
</tr>
<tr>
<td>14:30 - 14:50</td>
<td>Improved Robustness and Safety for Autonomous Vehicle Control with Adversarial Reinforcement Learning</td>
</tr>
<tr>
<td>14:50 - 15:10</td>
<td>Sequence-To-Sequence Prediction of Vehicle Trajectory Via LSTM Encoder-Decoder Architecture</td>
</tr>
<tr>
<td>15:10 - 15:30</td>
<td>Visual Place Recognition in Long-Term and Large-Scale Environment Based on CNN Feature</td>
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### Poster Sessions

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<tr>
<th>Time</th>
<th>Subject</th>
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<tbody>
<tr>
<td>16:00 - 18:00</td>
<td>Autonomous Driving Control-1</td>
<td>TianHua Hall</td>
</tr>
<tr>
<td></td>
<td>Visual Sensing-2</td>
<td>RenHe Hall 1</td>
</tr>
<tr>
<td></td>
<td>Software for Intelligent Vehicle</td>
<td>RenHe Hall 1</td>
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<td></td>
<td>Odometry</td>
<td>TianHua Hall</td>
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<td></td>
<td>Simulation and Case Analysis-1</td>
<td>RenHe Hall 2</td>
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<tr>
<td></td>
<td>Simulation and Case Analysis-2</td>
<td>RenHe Hall 2</td>
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<td>Autonomous Driving Control-2</td>
<td>TianHua Hall</td>
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<td>ADAS-1</td>
<td>RenHe Hall 2</td>
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<td>ADAS-2</td>
<td>RenHe Hall 2</td>
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<tr>
<td></td>
<td>Path Planning and Motion Classification</td>
<td>RenHe Hall 1</td>
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<td></td>
<td>Visual Sensing-1</td>
<td>RenHe Hall 1</td>
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<tr>
<td></td>
<td>Decision Making</td>
<td>TianHua Hall</td>
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### Special Sessions

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<thead>
<tr>
<th>Time</th>
<th>Subject</th>
<th>Location</th>
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<tbody>
<tr>
<td>16:00 - 18:00</td>
<td>Simulation and Navigation for Intelligent Vehicles</td>
<td>ZhaoWen Hall</td>
</tr>
<tr>
<td></td>
<td>Robotic and AI Solutions for Smart Mobility</td>
<td>LongLiQi Hall</td>
</tr>
<tr>
<td></td>
<td>Computational Intelligence in Vehicle and Transportation Systems</td>
<td>BoSiDeng Hall</td>
</tr>
</tbody>
</table>
Oral Sessions 2018.06.29 (Friday)

FrOSAT2 Conference Center
Sensor and Data Fusion

Paper FrOSAT2.1 10:20–10:40
A Speed Guide Modeler Collects Handover in Non-Signaled Intersections based on Reducible Game Theory
Chung, Cheng
Tiangui Univ.
Zhong, Yang
Bajing Inst. of Aerospace Control Devices
Danyi, Yeo
Tiangui Univ.

Paper FrOSAT2.2 10:40–11:00
Robust Camera Uar Sensor Fusion Va Deep Cased Information Fusion Network
Kim, Jaeikjun
Hanyang Univ.
Choi, Jaekyung
Phantom AI Inc.
Kim, YaeChoi
Hanyang Univ.
Koh, Junhoo
Hanyang Univ.
Signal Processing Machine Learning Lab
Chung, Chung Choo
Hanyang Univ.
Chen, Jun Won
Hanyang Univ.

Paper FrOSAT2.3 11:00–11:20
End-To-End Driving Activities and Secondary Tasks Recognition Using Deep Convolutional Neural Network and Transfer Learning
Choi, Jun Won
Hanyang Univ.
Chung, Chung Choo
Hanyang Univ.
Kim, Byeong Do
Hanyang Univ.
Park, Seong Hyeon
Hanyang Univ.

Poster Sessions 2018.06.29 (Friday)

FrPS-SST3 TianHua Hall
Autonomous Driving Control–1

Paper FrPS-SST3.1 16:00–18:00
Optimization of Braking Strategy for an Emergency Braking System by the Application of Machine Learning
Schratter, Markus
Virtual Vehicle Res. Center
Amler, Sabine
BMW Group
Daman, Paul
BMW Group
Watzinger, Daniel
Virtual Vehicle Res. Center

Paper FrPS-SST3.2 16:00–18:00
Smooth Behavioral Estimation for Ramp Merging Control in Autonomous Driving
Choo, Dong
Carnegie Mellon Univ.
Dolan, John
Carnegie Mellon Univ.
Likou, Baskirt
General Motor R&D Center

Paper FrPS-SST3.3 16:00–18:00
Automated Driving Interactive Automation Control System to Enhance Situational Awareness in Conditional Automation
Ott, Christian
BMW Group
Singh, Harniman
German Aerospace Center (DLR), Inst. for Robotics and Mechat.
Stelzer, Martin
German Aerospace Center (DLR), Inst. for Robotics and Mechat.
Schuster, Martin J.
German Aerospace Center (DLR), Inst. for Robotics and Mechat.
Fenn, Manuel

Paper FrPS-SST3.4 16:00–18:00
Optimization of Velocity Ramps with Survival Analysis for Intersection Maneuvers
Puphal, Tim
Honda Res. Inst. Europe GmbH
Probst, Malte
Honda Res. Inst. Europe
Yipang, Li
Honda R&D Co., Ltd
Sakamoto, Yasuke
Honda R&D Co., Ltd
Eggert, Julian
Honda Res. Inst. Europe GmbH

Paper FrPS-SST3.5 16:00–18:00
Development of BP Natural Network PID Controller and Its Application on Autonomous Emergency Braking System
Liang, Xing
Chongzang Univ.
Zhang, Zhan
Chongzang Univ.
Xin, Yang
Chongzang Univ.
Qingxiao, Wang
Chongzang Univ.
Yufang, Zhang
Chongzang Univ.
Ling, Zheng
Chongzang Univ.
Guo, Gang
Chongzang Univ.

Paper FrPS-SST3.6 16:00–18:00
Model Predictive Enhanced Adaptive Cruise Control for Multiple Driving Situations
Guo, Gang
Chongzang Univ.
Ling, Zheng
Chongzang Univ.
Wang, Gang
Chongzang Univ.

FrPS-SST9 RenHe Hall 1
Visual Sensing–2

Paper FrPS-SST9.1 16:00–18:00
Continuous Point Cloud Stitch Based on Image Feature Matching Constraint and Score
Fangzhao, Hu
Chongzang Univ. of Posts and Telecommunications
Yingguo, Li
Chongzang Univ. of Posts and Telecommunications
Zhen, Tian
Chongzang Univ. of Posts and Telecommunications
Wai, Huang
Chongzang Univ. of Posts and Telecommunications

Paper FrPS-SST9.2 16:00–18:00
Spatio–Temporal Depth Interpolation (STDI)
Chao, Sheng
Chinese Acad. of Sciences
Zhen, Tian
Chongzang Univ. of Posts and Telecommunications
Yinguo, Li
Chongzang Univ. of Posts and Telecommunications

Paper FrPS-SST9.3 16:00–18:00
Autonomous Driving
Fangzhao, Hu
Chongzang Univ. of Posts and Telecommunications
Yingguo, Li
Chongzang Univ. of Posts and Telecommunications
Zhen, Tian
Chongzang Univ. of Posts and Telecommunications
Wai, Huang
Chongzang Univ. of Posts and Telecommunications

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Special Sessions 2018.06.29 (Friday)

Technical Program Saturday June 30

IEEE IV 2018 On-road Demonstration: From Parallel Driving to Smart Mobility
Organized by iPDA (International Parallel Driving Alliance)

The intelligence of autonomous vehicles comes not only from the smart sensing and computing devices equipped onboard, but also from the experiences accumulated in the past, the guidance and training from human drivers, and the interactions and information sharing among vehicles. Based on these, Chinese scholars have proposed the framework of “Parallel Driving” at the beginning of this century, featuring a safe, reliable, effective, and efficient solution for rapid implementation of autonomous driving technologies, which can flexibly provide vehicle-to-vehicle operation management, vehicle state monitoring, and remote emergency takeover services. The concept of digital quadruplet for parallel automated vehicles has recently been further developed, including vehicle-based autonomous driving system and three “guardian angels” formulated in the artificial world, namely descriptive vehicle, predictive vehicle, and prescriptive vehicle. This aims to achieve a safe, smooth, swift, and smart (4S) collaboration among automated vehicles with different levels of automation. This on-road demonstration will present the essential functions of “Parallel Driving”, and autonomous vehicles provided by several companies/research institutions will be conveniently linked to a common “Parallel Driving” remote control platform to demonstrate collaborative and safe driving in real-world scenarios.

Time: June 30, 2018, 9:00AM—11:30AM
Location: China Intelligent Vehicle Proving Center (iVPC) (NO. 118, Yunshen Road, Changshu)

<table>
<thead>
<tr>
<th>Time</th>
<th>Agenda</th>
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<tbody>
<tr>
<td>09:00 - 09:30</td>
<td>Check In and Visit the Vehicles Exhibition Hall</td>
</tr>
<tr>
<td>09:30 - 10:00</td>
<td>Indoor Visit at the Parallel Driving Center</td>
</tr>
<tr>
<td>10:00 - 11:00</td>
<td>Demonstration of PDS 3.1 (Parallel Driving System, Version 3.1)</td>
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<tr>
<td></td>
<td>1. Service-oriented handover in general traffic scenarios</td>
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<td>2. Responsibility-sensitive takeover in emergent traffic scenarios</td>
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<td>3. Active obstacle recognition and collision avoidance</td>
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<td></td>
<td>4. Real-time monitoring of on-duty driver’s states</td>
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<tr>
<td>11:00 - 11:30</td>
<td>Questions &amp; Answers</td>
</tr>
</tbody>
</table>
The State Key Laboratory for Management and Control of Complex Systems

Introduction:

The State Key Laboratory for Management and Control of Complex Systems (SKL-MCCS) is hosted by the Institute of Automation, Chinese Academy of Science (CASIA). It started as the Laboratory for Control of Complex Systems in 1991, and became the Key Laboratory of Complex Systems Engineering of Chinese Academy of Sciences in 1994. In 2011, the Ministry of Science and Technology (MOST) of the People’s Republic of China officially approved the plan of construction of the SKL-MCCS for a period of two years. Facing the forefront of international academia, and responding to the major national strategic needs, ACP (Artificial Societies, Computational Experiments, Parallel Execution) approach was originally presented by SKL-MCCS to meet the challenges of management and control for complex systems involving engineering complexity and social complexity in engineering, society, economy and national defense. Based on ACP approach, SKL-MCCS carries out basic theory research, cutting-edge core technology development and major engineering applications, covering parallel management and intelligent control, advanced control based on robotics, intelligent medicine and cyber-based social computing. Through years of construction, the laboratory is thriving to become a world-class platform for scientific research, leading-edge technological innovation and talent cultivation.
Chinese Association of Automation

Introduction:

The Chinese Association of Automation (CAA), as a national academic association organized on a voluntary basis of individual or enterprise committed to research and development, education and application in the automation field, was founded in 1957. It’s affiliated to China Association for Science & Technology, and headquartered in Beijing. For over 60 years, CAA has made significant contributions to promoting and developing automation sciences and technologies in China.

Journals & Magazines

URL: http://www.caa.org.cn/

Institute of Automation, Chinese Academy of Sciences

Introduction:

Institute of Automation, Chinese Academy of Sciences (CASIA), as one of the earliest national automation institutes in China, was established in October, 1956. For over sixty years, CASIA has made great contributions to national economy construction, social progress, scientific and technological development and national security. The institute focuses on three main areas of intelligent technology: intelligent processing of massive information; intelligent control of complex systems; and integrated intelligent systems. CASIA produces innovative theory, key technology and conceptual systems to meet the strategic needs of the nation and of industry, making it well known worldwide in the field of intelligence science and technology, construction of innovative culture etc., which has laid solid foundation for creative leap and sustainable development of CASIA. The institute has 12 research departments, including National Laboratory of Pattern Recognition, The State Key Laboratory for Management and Control of Complex Systems, National Engineering & Technology Research Center for ASIC (NEOFAD), Key Laboratory of Molecular Imaging, CAS, Intelligent Manufacturing Technology and System Research Center, Integrated Information System Research Center, Digital Content Technology and Media Service Research Center, Precise Perception and Control Research Center, Aerospace Information Research Center, Brainnetome Center, Center for Research on Intelligent Perception and Computing and Research Center for Brain-inspired Intelligence. In addition, it has various kinds of united labs and engineering centers co-built with international and social innovative units and additionally has over 10 high-tech holding companies such as Hanvon, Scample etc.

URL: http://www.ia.cas.cn/
Introduction:
The Institute of Artificial Intelligence and Robotics (IAIR) of Xi’an Jiaotong University was established in 1986. Its predecessor was the Teaching and Research Section of Computer Control, Major of Automatic Control, and it is the earliest professional research institute engaged in artificial intelligence research in China. The IAIR is the support unit of the national key discipline of “pattern recognition and intelligent system” and the Key Laboratory of National Engineering Laboratory for Visual Information Processing and Application. In 2012, the International Research Center of Cognitive Science and Engineering was established with the support of the “Introducing Talents of Discipline to Universities Plan” sponsored by the Ministry of Education and the State Bureau of Foreign Experts and in cooperation with internationally renowned scholars. In 2016, an “Experimental Class of Artificial Intelligence Top-Talent Training” was established for undergraduate students at Qian Xuesen College. Under the leadership of Professor Nanning Zheng, an academician of the Chinese Academy of Engineering, the IAIR obtained the first round of Foundation for Innovative Research Groups from the National Natural Science Foundation of China (NSFC) in 2000.

At present, the IAIR has an excellent teaching and research team consisting of the academician of the Chinese Academy of Engineering, the scholar of National Thousand Talents Program, the Cheung Kong Scholar Professor, the winner of the National Science Funds for Excellent Youth, the expert of Hundred Talents Program of Shaanxi Province, the Outstanding Young Talents of the New Century of the Ministry of Education and so on. Now there are 13 Professors, 8 Associate Professors, 2 Senior Engineers, 4 Lecturers with Ph.D. degrees, 4 Experimental Technicians, and 2 Administrative Staffs in the IAIR. The IAIR maintains academic exchanges with famous universities such as the United States, Japan, the United Kingdom, and Singapore. It also conducts technical cooperation with well-known companies such as Microsoft, IBM, Intel, Huawei, Sunny, DII, Lenova, Banku, etc.

The National Engineering Laboratory of Visual Information Processing and Application in 2011, carries out the research and development of key technologies, system integration and engineering in the fields such as Visual Systems of Intelligent Robot in Space Station Environment, Multi-sensor Information Fusion and Processing for Unmanned Intelligent Vehicle, Video Monitoring and Content Analysis for Public Safety, and its aim is to become the base for technological innovation and engineering application of visual information processing in China. The chief professor of the Experimental Class of Artificial Intelligence Top-Talent Training is Professor Nanning Zheng. The aim of this class is to actively explore new models for cultivating talents of artificial intelligence and to cultivate the engineering talents with scientific qualities, as well as potential talents in the field of artificial intelligence, who can combine minds and hands. Since it was established, the class has engaged in artificial intelligence research centered on computer vision and pattern recognition and has achieved a series of research results that have significant influence at domestic and abroad. It has published numerous papers in the famous international academic journals such as IEEE T-PAMI, UCV, IEEE T-IP, IEEE T-IE, IEEE T-ITS, and world-class academic conferences such as NIPS, CVPR, ICSV, BCA, AAM, and IV, etc.; it successfully won the Third Prize of National Science and Technology Progress Award (Digital Stereoscopic Angiography System for Medical Stereoscopic X-ray Machines, 1993), Fourth Prize of National Invention Award (Cylindrical Image Transmission System, 1995), Second Prize of National Science and Technology Progress Award (Key Technology and Application of Digital Video Time-Space Adaptive Processing, 2007), Second Prize of National Natural Science Award (Theory and Method of Pattern Representation and Computation of Visual Scene Understanding, 2016), and Second Prize of National Science and Technology Progress Award (2.5D Projection and Scale and Depth of Application, 2017), and Third Prize of National Science and Technology Progress Award (3D Incremental Vision System, 2018), and Third Prize of National Science and Technology Progress Award (3D Incremental Vision System, 2018), and Third Prize of National Science and Technology Progress Award (2.5D Projection and Scale and Depth of Application, 2007). It has published a series of textbooks, such as “Intelligent Information Processing,” “Pattern Recognition and Intelligent Systems,” “Artificial Intelligence,” “Artificial Neural Network and Applications,” “Image Processing and Analysis,” “Computer Vision,” and “Digital Image Processing,” etc.

At present, the IAIR has an excellent teaching and research team consisting of the academicians of the Chinese Academy of Engineering, the scholars of National Thousand Talents Program, the Cheung Kong Scholars, the winner of the National Science Funds for Excellent Young Talents, the expert of Hundred Talents Program of Shaanxi Province, the Outstanding Young Talents of the New Century of the Ministry of Education and so on. Now there are 13 Professors, 8 Associate Professors, 2 Senior Engineers, 4 Lecturers with Ph.D. degrees, 4 Experimental Technicians, and 2 Administrative Staffs in the IAIR. The IAIR maintains academic exchanges with famous universities such as the United States, Japan, the United Kingdom, and Singapore. It also conducts technical cooperation with well-known companies such as Microsoft, IBM, Intel, Huawei, Sunny, DII, Lenova, Banku, etc.

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Hsue-shen Tsien Paper Award & Norbert Wiener Review Award

Hsue-shen Tsien Paper Award and Norbert Wiener Review Award were set up in 2017 to memorize Dr. Hsue-shen Tsien and Dr. Norbert Wiener’s significant contributions and to encourage scholars to contribute to the research and development of automation. The candidate papers should be published in JAS 1-3 year(s) before the year to award. The winners for each paper will be presented a certificate and an award of RMB 20K.

2017 Hsue-shen Tsien Paper Award

2017 Norbert Wiener Review Award

Editor-in-Chief
MengChu Zhou
New Jersey Institute of Technology, USA

Deputy Editor-in-Chief
Derong Liu
Guangdong University of Technology, China

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Acta Automatica Sinica
Qingdao Academy of Intelligent Industries

Introduction:

Qingdao Academy of Intelligent Industries (hereafter referred to as QAI) is jointly founded by Institute of Automation, Chinese Academy of Sciences, Qingdao National High-tech Industrial Development Zone, and Qingdao Science and Technology Bureau. It is officially registered as a new research institution with independent legal entity in May 2014.

QAI aims to maintain an international foresight, create international standards, and lead the development of intelligent industries based on Parallel Intelligence based theories and technologies. The purpose is to help Qingdao become a city of innovation, a capital of entrepreneurs, and an island of maker culture.
Intel makes possible the most amazing experiences of the future

You may know us for our processors. But we do so much more. Intel invents at the boundaries of technology to make amazing experiences possible for business and society, and for every person on Earth.

Harnessing the capability of the cloud, the ubiquity of the Internet of Things, the latest advances in memory and programmable solutions, and the promise of always-on 5G connectivity, Intel is disrupting industries and solving global challenges.

Leading on policy, diversity, inclusion, education and sustainability, we create value for our stockholders, customers, and society.

Visteon

Visteon is a global technology company that designs, engineers and manufactures innovative cockpit electronics products and connected car solutions for most of the world’s major vehicle manufacturers. Visteon is a leading provider of instrument clusters, head-up displays, information displays, infotainment, audio systems, SmartCore™ cockpit domain controllers, and vehicle connectivity.

Visteon also supplies embedded multimedia and smartphone connectivity software solutions to the global automotive industry. Headquartered in Van Buren Township, Michigan, Visteon has approximately 10,000 employees at more than 40 facilities in 18 countries. Visteon had sales of $3.15 billion in 2017. Learn more at www.visteon.com.

Visteon in China

Visteon has had a presence in China for nearly 26 years, and today China is the company’s fastest-growing market. Supporting its mission to enable a rich driving experience in a safe and convenient manner, Visteon is bringing advanced technologies and high-quality products to vehicle manufacturers in China. Visteon serves the China market through joint ventures, with 10 manufacturing facilities, four technology centers and one customer service center.
Automated Driving System

The automated vehicle is equipped with a series of sensing systems such as laser, radar, inertial navigation device, and cameras. It interacts with the parallel driving control center through an on-board computing device. It has an automatic remote control mode and is equipped with an E-stop emergency braking module, which provides a safer and more reliable automated driving technology. At the same time, the on-board HMI device synchronously displays the state of the sensors, vehicle status, and the operation mode of the automated vehicle.

Parallel Driving Control Cabinet

The Parallel Driving Control Cabinet is the core device of the parallel remote control system. It is responsible for monitoring and guiding the operation of automated vehicles. The parallel driving control software simulates the vehicle dynamics in the simulation platform in the real-time. The vehicle terminal data is acquired through the interaction between the IPC and the vehicle. The data will be monitored on the LCD panel of the cabinet in real-time and also shown on the alien panel in the control center via the linkage epistor.

Parallel Takeover System

The Driving Simulator serves as a terminal device for parallel remote driving. It is responsible for taking over the automated vehicle under the emergency situations or receiving the takeover request from the vehicle. The driver on the driving simulator can control the vehicle remotely through the steering wheel, throttle, and brake pedal. Meanwhile, the simulator enables the real-time simulation of all the tested vehicles with the corresponding navigation locations, and the in-vehicle photo epistor.

VEHICLE INTELLIGENCE PIONEERS INC.

COMPANY PROFILE

Vehicle Intelligence Pioneers Inc., known as VIPioneers for short, was established in October 2014. The company is focusing on the ACP-based parallel driving research and is committed to the research, development and industrialization of a new generation of cloud-based connected automated driving technology. Centering on the parallel perception, parallel learning, and intelligent connected technology, VIPioneers is deeply exploring the automated driving, scene-aware design, and the testing systems, and is committed to providing users with leading industry solutions for automated driving technologies. The company research team has developed a number of core technologies with Independent Intellectual property rights. VIPioneers has been a leader in providing the automated driving solutions, cloud-based connected automated driving, intelligent vehicle testing, and other aspects. VIPioneers has strategically cooperated with several leading companies in the industry to realize the industrialization of connected automated driving. The third-generation “Parallel Driving System”, which is recently developed and completed the road test, is committed to helping the customers to achieve a safer, faster and more efficient lending for the automated driving technology.

The 29th IEEE Intelligent Vehicles Symposium

CHJ INTRODUCTION

We believe that, except for public spaces, the two most important make spaces is not just our cars and our homes. This is why we’re not only to make better cars, to create a high-quality mobility space. While providing a pleasant surface, superior comfort, and high quality, the mobility space should help users to effectively get access to external resources, information, and services, and should be flexible and reconfigurable.

We are committed to building a growing company and giving every member of our company an opportunity for self-development. Therefore, every employee will be fully integrated and autonomously, we will work together and solve problems based on common values and a transparent management system, which is the basic reason for our higher efficiency and faster iterative development process.

OUR PRODUCT

CHJ is a Chinese passenger car with a premium intelligent system. Without a doubt, it adopts the Toyota Power-by-Wire electric system, a large-capacity battery pack and a range estimator. Its range is over 700 kilometers, which meets the most of the test scenarios. In addition, it is equipped with an advanced driver assistance system and ADS that can ensure the safety of both inside and outside the car.

Our MOBILITY SERVICE

CHJ and the CH Group have established a strategic partnership, with both sides building specialized intelligent electric vehicle sharing the mobile space, and developing a deep multi-functional partnership in autonomous vehicle, new energy vehicles, data & analysis, and smart city services.

AUTONOMOUS DRIVING STRATEGY

1. Strategy

Realize massive production and commercial operation of CHJ in 2021 and achieve the goal of 100 million kilometers driving service per day by 2022.

2. Introduction

a. CHJ plans to develop a Mach-2x solution that complies with advanced dynamics, as well as the autonomous driving
b. CHJ also plans to launch a platform with vehicle system, data & simulation, and test R&D experience.

3. Test Introduction

CVE members come from top ten technology, Technical, and the team is quickly expanding.

OUR MANUFACTURE

CHJ has built a 1.0 million vehicles factory. It has an annual production capacity of 500,000 square meters, with an integrated capacity of 200,000 vehicles, the manufacturing base will be highly automated, with a high efficiency, energy-saving, and environmentally friendly manufacturing process.

OUR TEAM

CHJ has established an R&D and supply chain team of nearly 1,000 professional R&D and mass production preparation work are progressing efficiently. Of those, the scale of the intelligent system R&D team exceeds 300 persons. They are specialists in IoT of intelligent systems, intelligent services, and automatic driving systems.

FINANCING INFORMATION

Over the past two and a half years, CHJ has attracted 5.166 billion RMB of funding. The backing investor fund is Baidu Ventures, SoftBank Vision Fund 2, Future X, Fosun Capital, and other organizations. Investing, with a combined investment of 1.5 billion RMB, as the sole financial consultant for this round of funding.
你不了解的美团技术团队

美团是全球最大的生活服务电子服务平台，秉承‘让生活更美好’的使命，美团的业务覆盖了打车出行、餐饮、外卖、酒店旅游、亲子、本地生活等领域具有领先的地位。

AI（人工智能）技术已经广泛应用于美团的众多业务，从美团App到大众点评App，从外卖到打车出行，从旅游到婚庆亲子。美团数百名优秀的算法工程师正致力于将AI技术应用于搜索、推荐、广告、风控、智能客服、语音识别、机器人、无人配送等多个领域，帮助美团3.2亿消费者和400多万商户改善服务和体验，帮大家吃得更好，生活更美好。

A I 技术在美团的主要业务应用

- 搭建了世界上规模大，复杂度高的多人，多点实时智能配送调度系统
- 推出了业内第一款大规模落地的企业应用版高并发产品，为50万商家配备了智能语音系统
- 构建了世界上最大的商品知识库，为200多万商家，3亿多条商品描绘了知识图谱，为2.5亿用户提供精准的用户画像，并构建了世界上用户规模大，复杂度最高的O2O智能推荐平台

美团无人配送车

美团致力于先进的无人配送技术，对配送方式进行改革，增加活力的供给。美团无人配送车主要应用于自主研发的配送路线规划和运营算法，能够实现全方面无痕配送。实现自动化配送，使得产品技术更加完善，既可以选择固定路线自动导航行驶，而且也具备适应规划，智能避障，车道保持，智能跟行等功能。

美团目前正正式加入加州伯克利DeepDrive，开展自动驾驶平台和产业联盟，与清华大学等高校实验室建立合作。同时间内还拥有优势产品，拥有自主研发，同时引进其他先进技术，在无人配送场景、数据等方面加强自动驾驶的技术创新，理论创新，以及落地应用的进程。

中云智车科技有限公司

专业对特定场景无人驾驶车辆解决方案提供者，以线控化、模块化、通用化的无人驾驶车辆线控底盘为技术支撑和基础产品，致力于特定场景无人驾驶车辆在各个细分场景下的不同解决方案。旗下已成功开发无人驾驶车“中云智承”、“无人物流车”“中云智达”、“无人摆渡车”“中云智流”等，为推动特定场景无人驾驶车辆的快速落地应用而不懈努力。

中云智车于2018年5月推出全国首台高精度无人驾驶车辆的小型通用型线控底盘“中云1.0”，目前已有订单6台，意向订单百余台，技术更先进、技术更安全、技术更适配的中型、重型通用底盘已成功样机开发，开始接受意向订单。

公司于2018年9月正式成立，位于北京中关村创新示范中心，获得数亿元天使轮投资。中云智车是北京理工大学创新型企业，以系列“特定场景无人驾驶”为产品线的创新企业，致力于无人驾驶在不同商业场景的落地应用，拥有无人驾驶车辆，正向研发、生产、运营，已研发专利10余项，获得了多个省市示范项目及互联网政策的示范扶持，已有与10余家大型物流、电商巨头、高等院校等达成了战略合作协议。

中云智车，欢迎您的关注！

www.cciv.net.cn

中云智车

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Nanjing Rongjun Technology Co., Ltd. was established in August 2014. It is a 321-enterprise headquartered in the city of Nanjing. The company is mainly engaged in the control system of electric vehicles and smart vehicles, comprehensive vehicle test platforms, and the development and production of unmanned wire-controlled chassis. The core technical team has extensive experiences from notable organizations in both academic and industrial fields, including Ohio State University, Tsinghua University, Peking University, China CRRC, Fluke, etc.

Our company has independently developed a variety of platforms for distributed drive solutions and wire-controlled chassis solutions, which can be applied to the automotive, unmanned logistics and other related fields. We have also developed unmanned vehicles for specific scenes, providing wire-controlled, integrated, modular, and general chassis system solutions. Our company has established cooperative partnerships with a number of well-known domestic companies to provide long-term products and technology solutions. The current annual revenue has exceeded 10 million RMB. In addition to our company’s comprehensive technology research and development capabilities, our production and standardization capabilities have been blooming lately. We have approximately 5,000 square meters of R&D and production site, including a processing center, CNC lathes, CNC milling machines, presses and other product processing equipment and initiated a standard chassis production line.

Unmanned Loading Logistics System Based on Parallel Intelligent Technology

Qingdao Huichang Information & Technology Co., LTD (hereafter referred to as HUCHANG) is incubated by Qingdao Academy of Intelligent Industries. HUCHANG specializes in logistics and is committed to fully utilizing resources in intelligent technology of unmanned logistics system based on parallel intelligent technology. Our company has attracted wide attention from the industry, represented by Tsingdao Brewery Co., Ltd., Haier Appliances, Geely Electric Appliances and many other enterprises have reached an intention of cooperation with us. The unmanned loading system we research and independently has been on trial operation stage.

The unmanned loading system is developed by 3D vision, dynamic loading algorithm, parallel theory and deep learning, and its work process is: firstly, takes use of 3D vision to scan the surface profile of truck and cargo, and gets image 3D point cloud data; secondly, computes the point cloud data to know the truck coordinate with vision algorithm and every cargo coordinate with loading algorithms; finally, guides the robot to position and loading.

The unmanned loading system integrates advanced parallel intelligent technology and high-precision intelligent robot organically which leads the industry in overall technical level. The system is robust and scalable. Furthermore, the system can completely replace the manual operation and realize automatic and unmanned loading. We could provide an excellent business plan about the unmanned loading system except related technology. Our achievement is applicable for 3C, e-commerce, food, medicine, FMCG and other industries.

We are a young team with full of passion, dreams and energy, if you aspire to apply your research on machine vision and artificial intelligence to the field of logistics loading and picking, please join us! We are willing to invite the best talent both from home and abroad to build intelligent logistic!
The 29th IEEE Intelligent Vehicles Symposium

Qingdao Huicheng Intelligent Technology Co., Ltd.

Qingdao huicheng intelligent technology co., LTD is a technology company founded by Qingdao institute of intelligent industry and technology. The company was founded in October 2014 with a registered capital of 1 million yuan. Company around the city of wisdom, science and technology in the field of intelligent transportation demand, based on existing technology innovations by automation of Chinese academy of sciences, make full use of resources, industrial innovation, through the industry cutting-edge technology innovation, system integration, engineering research and development and the transformation of scientific and technological achievements transfer, actively explores development characteristic, has the wisdom of the urban core competence, intelligent transportation industry service products.

Key projects include: Qingdao city road parallel control system; Parallel transport projects of "multiplug in one"; Intelligent parallel cloud parking service system; Mobile phone signaling and public opinion system; Video intelligent fire alarm system; Subway video automatic detection and monitoring system based on Internet of things and cloud computing.

Since the establishment of the company, nearly 100 service enterprises.

1. Qingdao huicheng intelligent technology co., LTD.智能云综合管理平台: provides the decision support, information collection, integration, analysis, modeling prediction to traffic information between traffic system and artificial transportation systems run network planning, in the traffic control calculation of experiment and evaluation, traffic modeling and control services. System based on urban traffic road parallel control concept ACP method to provide a comprehensive set of services. The system provides the decision support, information collection, integration, analysis, modeling prediction to traffic information between traffic system and artificial transportation systems run network planning, in the traffic control calculation of experiment and evaluation, traffic modeling and control services.

2. The parallel traffic control system adopts the international leading parallel control concept ACP method to provide a comprehensive set of traffic modeling and control services. System based on urban traffic road network planning, in the traffic control calculation of experiment and evaluation platform for intelligent aided decision, building the actual interaction between traffic system and artificial transportation systems run and evolution process of the parallel system, realize from the traffic information collection, integration, analysis, modeling prediction to traffic scene, to controls execution feedback closed-loop intelligent processing, from city traffic management information ascend into a new stage of intelligence.

Core business:
1. The network public opinion acquisition and analysis system is based on Internet intelligent fetching large data analysis technology, open and public Internet access to information, can through the preset keywords library, real-time monitoring of key sites, microblogging, dynamic WeChat, BBS and other news. The collected information is classified automatically, positive and negative information is judged, emotion analysis, information early warning, data statistical analysis, and public opinion index is generated automatically. The user can fully and quickly understand the situation of network public opinion, and quickly track the hot issues, find out the potential public opinion risks, and improve the timeliness of solving the problems. The system includes the public opinion early warning platform, the public opinion automatic classification push platform and the public opinion guidance and control platform, and provides comprehensive public opinion collection and analysis services.
2. The parallel traffic control system adopts the international leading parallel control concept ACP method to provide a comprehensive set of traffic modeling and control services. System based on urban traffic road network planning, in the traffic control calculation of experiment and evaluation platform for intelligent aided decision, building the actual interaction between traffic system and artificial transportation systems run and evolution process of the parallel system, realize from the traffic information collection, integration, analysis, modeling prediction to traffic scene, to controls execution feedback closed-loop intelligent processing, from city traffic management information ascend into a new stage of intelligence.

MAIN BUSINESS:
1. Test Field Design and Test Management
   We design the test field for Advanced Driver Assistance System (ADAS), Autonomous Drive and V2X tests. Based on the test field we design, we develop the test plan, test specification for validation tests. Furthermore, and plus the test arrangement (test vehicle license, vehicle maintenance and etc.).

2. Test Equipment
   We design, develop and integrate the test equipments for Advanced Driver Assistance System (ADAS), Autonomous Drive and V2X tests; We modify the vehicles for tests; We support the test execution.

3. Smart Telematics System
   We provide the complete data collection, real-time monitor and big data analysis system for special fleet or task.

INTELLENGENT TEST TERMINAL:
With cm-level precision positioning ability, the equipment can store the status data of the intelligent connected vehicles efficiently, including CAN Bus data, RS232 interface data, high precision trajectory data, four-channels video data, and so on. In addition, the device has the capability of data transmission, via 3/4G wireless connection, or Ethernet. This equipment is suitable for the intelligent connected vehicle test, especially for the vehicle system development test to record vehicle state information data, analyze the subsequent vehicles’ control system to evaluate whether the design requirements are fulfilled. Furthermore, the device has rich functions and interfaces. With its own optimized Linux operating system, it can be used for rapid prototypes in the development process.

Core business:
Changshu KUNLUN Intelligence Technology Co., Ltd. is located in China Intelligent Vehicle Building at Changshu High Tech. Zone.
The major business area is Smart Connected Vehicle Test Field Design, Test Services and Test Equipment development and Integration. Based on the actual conditions, We design the Test Field for Smart Connected Vehicles. For Advanced Driver Assistance Systems (ADAS), Autonomous Drive and V2X tests, we design the test scenery and test specification. Considering the dedicated requirement of smart connected vehicle test, we develop the test equipments. Together with the other test equipments, build the whole test system to collect, record and analyze test data.

With the Test Field in Changshu and Test Equipments, we provide test services. With all the know-how from the test management, we can also provide the system solution for vehicle data collection, real-time monitoring, vehicle fleet management and big data analysis for start mobility application.

The company has independent intellectual property rights and has applied for many patents. In 2017, it won the honor of top ten innovation and entrepreneurship enterprises in the high-tech zone, and was selected as the leading talent plan of changshu innovation and entrepreneurship in 2017.

We also have independent intellectual property rights and has applied for many patents. In 2017, it won the honor of top ten innovation and entrepreneurship enterprises in the high-tech zone, and was selected as the leading talent plan of changshu innovation and entrepreneurship in 2017.
Company Introduction

As Tier 1, we provide automated driving system solution for OEMs:
- Massive Engineering experience for OEM business
- Deep understanding of market and customer requirements
- Deep understanding of automotive standards (IATF 16949, ISO 26262, AUTOSAR)
- Flexible and quick to act

Core Technology
- Sensor Data Fusion
- Planning and Decision Algorithm
- Automotive system and HW/SW design competence
- Vehicle dynamic control
- Control by Wire technology

Professional Team
- China’s first group of ADAS / automated driving experts
- Professional automotive engineering and management team
- Massive customer project experience
- Deep understanding of Chinese specific automotive standards (IATF 16949, ISO 26262, AUTOSAR)
- Flexible and quick to act

Industrialization
- Automated Driving Domain Controller
- Intelligent Front Camera

As Tier 1, we provide automated driving system solution for OEMs:
- Mature data fusion, decision & planning, control algorithms with experienced software/hardware/system development capabilities
- Automated Driving Domain Controller
- Intelligent Front Camera

Company Introduction

iMotionAutomotive Technology (Changshu) Co., Ltd.
No. 188 Yunshen Road, Changshu National New & High Tech Industrial Development Zone
www.imotion.ai

Where Rubber Meets the Road: Linking Research and Practice

ITSC/ITIS Joint Symposium on Development of Intelligent Transportation Systems to be held in conjunction with 21st International IEEE Conference on Intelligent Transportation Systems, November 6–7, 2018

The 21st International Conference on Intelligent Transportation Systems (ITSC) and the Institute of Transportation Engineers (ITIE) will jointly organize a symposium in conjunction with the 2018 International Conference on Intelligent Transportation Systems (ITSC). This joint symposium is to bring the research community (ITSC membership community) and practitioners (ITIE membership community) to facilitate exchanges on opportunities and challenges to deploying advanced IT technologies. The symposium will feature two tracks: (1) Smart Communities and Connected/Automated Technologies, and (2) Urban Zero. Please visit the conference website for more information (https://www.ieee-itsc2018.org/way-to-join-meeting.htm).
The 2019 IEEE Intelligent Vehicles Symposium (IV’19) is a premier annual technical forum sponsored by the IEEE Intelligent Transportation Systems Society (ITSS). It brings together researchers and practitioners worldwide to share and discuss the latest advances in theory and technology related to intelligent vehicles. It welcomes articles dealing with any aspect of intelligent vehicles, as well as proposals for workshops and tutorial sessions.

The workshops will be held in the historical building of MINES ParisTech (downtown Paris in the Latin Quarter) June 9. The main conference venue will be the Palais des Congrès in Issy-les-Moulineaux (easily accessible by metro) June 10-11. And the symposium will end on the test track of Versailles-Satory June 12 where demonstrations will be held.

The 30th Intelligent Vehicles Symposium is organized to offer the best possibilities of exchanges regarding latest scientific and technological development to together with the quality of life in Paris where everything is accessible by walk or metro (I in 4 inhabitants of Paris don’t have a car).

IEEE IV 2019

30th IEEE Intelligent Vehicles Symposium
Paris June 9-12, 2019

ITSC 2019

IEEE – Intelligent Transportation Systems Conference
ITSC 2019
http://www.itsc2019.org

ITS World Congress, 21 – 25 October 2019, Singapore
IEEE – ITSC 2019: 27 – 30 October 2019,
Auckland, New Zealand
IEEE – IROS 2019, 03 – 08 November 2019, Macau, China