

SAE 2019 INTELLIGENT AND CONNECTED
VEHICLES SYMPOSIUM

汽车智能与网联技术 国际学术会议

10月15-16日·中国昆山
October 15-16, Kunshan China



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SAE International 国际自动机工程师学会 是航空航天、汽车、商用车及工程农用机械领域权威性专业学会。相对于其他机构，SAE 制定的车辆和航空航天标准在行业内占据绝对优势。同时，SAE 还提供全球最丰富的航空航天、汽车、商用车及工程农用机械领域的工程信息，并拥有全球性的车辆及航空航天工程师社交网络。

我们通过全面的项目、产品和服务，为行业提供信息、工具和技术，以帮助专业人士更好地完成工作，并保证下一代业内工程师能够获得良好的职业发展。

自 1905 年起，SAE 就开始建立航空航天、汽车、商用车及工程农用机械领域的工程师网络，整合他们所需要的技术资源，以满足他们终生学习的需要，推动行业技术的进步与发展。

SAE International 第一任副主席是一个名叫亨利·福特（美国福特汽车公司创始人）的才志兼备的工程师，在最早的发展阶段，SAE 就获得了奥维尔·莱特（飞机发明人之一）等人的支持。在此基础上，我们建立了一个紧密合作、信息互通的广泛的中立性平台，并制定了许多首创标准。今天，SAE 已经成为了全球公认最权威的航空、汽车、商用车及工程农用机械工程知识来源，而信息共享仍然是我们的基本原则。

A professional society, SAE International is the authority on vehicle engineering. We develop more vehicle technical standards—and more aerospace standards—than any other organization. We offer the largest library of vehicle engineering content. And, we bring together the largest global network of engineers in the world.

Through a comprehensive collection of programs, products and services, we supply the information, tools, and technical know-how to help today's professionals do their jobs better while we ensure the development of the next generation of mobility engineers.

Since 1905, SAE has connected automotive, aerospace, and commercial vehicle engineers to each other and the technical resources needed to foster a lifetime of learning, solutions to improved vehicle technology, and the advancement of the mobility industry.

SAE International—whose first vice president was an up-and-coming engineering talent by the name of Henry Ford and included early supporters like Orville Wright—was based on providing a platform for collaborative and informed dialog and the impetus of its earliest standardization efforts. Today, the sharing of information remains at its core, with SAE being acknowledged globally as the ultimate knowledge source for mobility engineering.



同济大学 历史悠久、声誉卓著，是中国最早的国立大学之一，是教育部直属并与上海市共建的全国重点大学。经过 112 年的发展，同济大学已经成为一所特色鲜明、在海内外有较大影响力的综合性、研究型、国际化大学，综合实力位居国内高校前列。

在始于 1949 年的全国院系调整中，同济大学原有的文、法、医、理、机械、电机、造船、测绘等优势学科或支援其它高校，或整体搬迁内地。同时，全国 10 多所大学的土木建筑相关学科汇聚同济，使之成为国内土木建筑领域规模最大、学科最全的工科大学。1978 年以后，学校实行“两个转变”——恢复对德交流由封闭办学向对外开放办学转变，由土建为主的工科大学向理工为主的综合性大学转变。1996 年，

上海城市建设学院和上海建筑材料工业学院并入，列为国家“211 工程”建设高校。2000 年，与上海铁道大学合并，组建成新的同济大学。2002 年，列为国家“985 工程”建设高校。2003 年，上海航空工业学校划归同济大学管理。2004 年，列为中管高校。2017 年，列为国家世界一流大学建设高校。

With a long history and high reputation, Tongji University is one of the earliest national universities in China. It's a national key university directly under the Ministry of Education and was jointly established by MOE and Shanghai government. After 112 years of development, Tongji University has become a comprehensive, research-oriented and international university with distinctive features and great influence at home and abroad. It ranks among the top universities in China in terms of comprehensive strength.

In the reconstructing of higher education institutes that began in 1949, the original disciplines of literature, law, medicine, science, machinery, motor, shipbuilding, surveying and mapping, etc. of Tongji University either merged into other colleges or universities, or moved to inland as a whole. Meanwhile, the civil engineering-related disciplines of more than 10 universities gathered in Tongji, making it the largest and most comprehensive engineering university in the civil engineering field. After 1978, Tongji implemented “two transformations”: resuming exchanges with Germany and opening up education which was once closed, as well as transforming from a civil construction-based engineering university into a comprehensive university focused on science and engineering. In 1996, Shanghai Institute of Urban Construction and Shanghai Institute of Building Material merged into Tongji University, and Tongji University was listed as a national 211-Project key university. In 2000, it merged with Shanghai Railway University forming a new Tongji University which was listed as a key university of the national 985-Project in 2002. In 2003, Shanghai Aviation Industry School was placed under the management of Tongji University. In 2004, it was listed as a university directly under the Central Committee of the Communist Party of China. In 2007, Tongji University was enrolled in the national plan of developing world-class universities.



昆山经济技术开发区
管委会

昆山市人才工作领导小组
领导小组办公室

昆山经济技术开发区（以下简称“昆山开发区”）创建于1984年，1991年底经省政府批准为省级经济技术开发区，1992年8月成为国家级经济技术开发区，辖区面积115平方公里，总人口69.8万。建区以来，昆山开发区坚持以思想解放为先导，不断深化改革开放，引领产业多元化、功能创新化、园区城市化发展，综合保税区、光电产业园、留学人员创业园等一批国家级特色功能园区已具规模，机器人智能装备产业园、欧美科学产业城、高端食品产业园等一批特色产业园区正在加快建设，形成了电子信息、光电显示、精密机械、装备制造、民生轻工五大主导产业。截至目前，累计引进欧美、日韩、港澳台等50个国家和地区客商投资的2242个项目，投资总额370亿美元，注册外资198亿美元，注册内资企业数量超过14800家，注册资金超过600亿元，昆山开发区先后被评为成为国家知识产权示范园区、海外人才中国创业示范基地、全省首批创新型开发区和“两化融合”示范区，体制创新指数得分位列国家级开发区第一。在商务部开展的国家级开发区综合发展水平评价中，昆山开发区连续多年位居全国前四。

近年来，昆山全面落实党管人才原则，市人才办充分发挥牵头抓总职能，统筹推进全市人才工作，为昆山争当“强富美高”新江苏建设排头兵，努力走在高水平全面建成小康社会前列提供有力的组织保证和人才支撑。

至2017年8月底，全市引进和培养国家“千人计划”人才108人（其中自主申报入选25人），自主申报入选国家“万人计划”人才5人，省双创人才92人、省双创团队14个，姑苏人才112人、姑苏重大创新团队1个，昆山双创人才379人、双创团队9个，人才资源总量35.6万人，

人才贡献率达49.3%，高层次人才规模和质量均位居全省县级市前列，人才综合竞争力连续四年位列全省县市第一。在福布斯发布的年度中国大陆最佳商业城市排行榜百强中，人才指数连续两年位居全国县级市首位。

昆山是全国唯一同时建有国家“千人计划”基地和国家“万人计划”基地的县级市。昆山两岸青年创业园被国台办认定为首批“海峡两岸青年创业基地”。目前全市建有省级院士工作站9个，企业博士后科研工作站和分站66个，研究生工作站132个；国家级科技企业孵化器5家，省级孵化器7家；各级各类众创空间31家，其中国家级1家、省级9家。

Kunshan Economic & Technological Development Zone (KETD), founded in 1984, was approved by the provincial government as a provincial economic and technological development zone in the end of 1991 and China national technical development zone in August 1992, covering an area of 115 square kilometers and with a population of 698 thousands.

Since KETD was established, it has always been insisting emphasizing ideological emancipation, deepening reform and opening up, and leading industrial diversification, functional innovation and urbanization. A batch of national characteristic industrial parks such as the comprehensive Free Trade Zone, Photoelectric industrial park and overseas student pioneer park has begun to take shape. What is more, quite a few parks, for instance, Robot intelligent equipment industrial park, European and American science industry city, high-end food industrial park is under construction, which forms five leading industries --electronic information, photoelectric display, precision machinery, equipment manufacturing and livelihood light industry.

So far, KETD attracted investors from Europe, America, Japan, Korea, Chinese Hong Kong, Macao and Taiwan etc., over 50 countries and regions to invest over \$37 billion, with a registered capital of \$19.8 billion & 2,242 invested projects. The number of registered domestic enterprises exceeds 14,800 and the registered capital exceeds 60 billion RMB. KETD is evaluated as the national intellectual property demonstration zone, overseas talents entrepreneurship demonstration base in China, the province's first innovative development zone and "two combination" demonstration area. Its system innovation index ranks first in the national development zone. In the evaluation of the comprehensive development level of national development zones carried out by the ministry of commerce, KETD has been the top four in the country for years.

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湖南大学汽车车身先进设计制造国家重点实验室

State Key Laboratory of Advanced Design and Manufacturing for Vehicle Body

<http://dmvb.hnu.edu.cn/>

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中国人工智能学会智能驾驶专业委员会

Intelligent Driving Committee of Chinese Association for Artificial Intelligence

10月15日 October 15

9:00

开幕及欢迎致辞 Opening & Welcome Speech

9:25

项目签约及合作仪式 Signing and Cooperation Ceremony

9:35

主旨演讲 Keynote Speech

10:20 茶歇 Tea Break

10:50

主旨演讲 Keynote Speech

12:20 午餐 Lunch

金陵厅 A

Jingling Hall A

13:40

智能交通与车联网

Intelligent Transportation Systems and V2X

金陵厅 B

Jingling Hall B

13:40

人工智能与无人驾驶

AI and Autonomous Vehicle

15:30 茶歇 Tea Break

16:00

智能交通与车联网

Intelligent Transportation Systems and V2X

16:00

人工智能与无人驾驶

AI and Autonomous Vehicle

10月16日 October 16

9:00

主旨演讲 Keynote Speech

9:45

演讲及圆桌 Speech & Panel

10:25 茶歇 Tea Break

10:55

演讲及圆桌 Speech & Panel

12:15 午餐 Lunch

金陵厅 A

Jingling Hall A

13:30

传感器、多传感融合与感知

Sensors, Multi-Sensory Fusion and Perception

金陵厅 B

Jingling Hall B

13:30

测试与验证

Testing and Validation

15:20 茶歇 Tea Break

15:50

传感器、多传感融合与感知

Sensors, Multi-Sensory Fusion and Perception

15:50

地图与定位

Map and Positioning

17:10

最佳论文评选

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地图与定位

Map and Positioning

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Huimin MA Tsinghua University

October 15

9:00 **OPENING & WELCOME SPEECH**

Mark Chung CMO, SAE International

Zhuoping YU Assistant Principal & Professor, Tongji University

Yiping SHEN Member of Standing Committee, The CPC Kunshan Committee
Deputy Secretary, The Party Working Committee of KETD
Deputy Director, The Administration Committee of KETD

SIGNING AND COOPERATION CEREMONY

KEYNOTE SPEECH

9:35 **Automotive Predictive Control Technology in Intelligent Network Era**

Hong CHEN

Professor, Tongji University

Director, State Key Laboratory of Automotive Simulation and Control



ABSTRACT

Predictive control has become a hot technology in the era of intelligent connectivity where ubiquitous sensors provide an exponentially increasing amount of information. This presentation discusses key technologies of predictive control, its automotive applications and practical cases.

10:20 TEA BREAK

MODERATOR: Yusheng LI CHANGAN

10:50 **Breaking Walls between Stakeholders in Autonomous Vehicle System**

Miwako Doi

Auditor of NICT

Executive Director of NAIST



ABSTRACT

Conventional human interface design discusses the issues between a driver and a vehicle. Now autonomous vehicles connect each other and the other stakeholders. Now we must design multi interactions among multi stakeholders of autonomous vehicles. I present you who are the multi stakeholders in autonomous vehicle system and how to break walls between these stakeholders in order to realize the smooth autonomous vehicle system.

11:35 **Intelligent Delivery Systems**

Youngang BIAN

Deputy Researcher, State Key Laboratory of Advanced Design and Manufacturing for Vehicle Body
Hunan University



ABSTRACT

The Intelligentization and connectivity technology is accelerating the development of intelligent and connected vehicles (ICV) and intelligent transportation systems (ITS). Different from microscopic ICV and macroscopic ITS, intelligent delivery systems (IDS), which focus on mesoscopic transportation, act as a bridge between ICV and ITS and have become an important research area for the application and industrialization of the intelligentization and connectivity technology in the field of delivery and transport equipments. This talk firstly introduces the definition and content of IDS, and then discusses the system composition and key techniques of IDS. The recent advances in IDS in Hunan University are introduced finally in this talk.

12:20 LUNCH

10月15日

9:00 开幕及欢迎致辞

Mark Chung SAE International 首席市场官

余卓平 同济大学 校长助理、教授

沈一平 昆山市委常委、昆山开发区党工委副书记、管委会副主任

项目签约及合作仪式

主旨演讲

9:35 智能网联时代的汽车预测控制技术

陈虹

同济大学 教授

汽车仿真与控制国家重点实验室 主任



演讲摘要

预测控制在泛在传感、信息极大丰富的智能网联时代成为一项热门技术，本报告讨论预测控制关键技术和汽车应用与实践例子。

10:20 茶歇

主持人：黎予生 长安汽车

10:50 打破自动驾驶系统中利益相关者之间的壁垒

土井美和子

情报通信研究机构 监事

奈良先端科学技术大学院大学 理事



演讲摘要

传统的人机界面设计讨论的是驾驶员和车辆之间的问题。现在，自动驾驶汽车将彼此和其他利益相关者连接起来。现在，我们必须设计出自动驾驶汽车的多利益相关者之间的多重交互。我将向大家介绍自动驾驶汽车系统中的多利益相关者，以及如何打破这些利益相关者之间的壁垒，从而实现自动驾驶汽车系统的平稳运行。

11:35 智能运载系统

边有钢

湖南大学

汽车车身先进设计制造国家重点实验室副研究员



演讲摘要

智能网联技术推动了智能网联车辆与智能交通系统的快速发展。区别于微观的智能网联汽车与宏观的智能交通系统，智能运载系统聚焦于中观交通层，连接了智能网联车辆与智能交通系统，是智能网联技术在运载装备领域产业化落地的重要发展方向。本报告首先介绍了智能运载系统的相关定义与内涵，而后讨论其系统组成与关键技术，最后介绍湖南大学在智能运载系统领域的研究进展。

12:20 午餐

Jingling Hall A

Intelligent Transportation Systems and V2X

MODERATOR: Fen LIN

Nanjing University of Aeronautics and Astronautics

Jingling Hall B

AI and Autonomous Vehicle

MODERATOR: Lu XIONG

Tongji University

13:40

Thoughts on IoV (ICV) Practice and Development in Shenzhen

Qi LIU

Secretary General

Shenzhen Intelligent Connected Automobile Industry Innovation Promotion Association



ABSTRACT

The presentation comprehensively summarizes the works Shenzhen has done in the ICV policy, industry, ecology, infrastructure, road testing and application demonstration, and proposes the idea of making Shenzhen a pilot demonstration city of ICV and Smart Transportation.

The Application of Artificial Intelligence Algorithm in The Mass Production of Autonomous Vehicles

Jishun GUO

Director of Intelligent Driving Technology Department, GAC R&D Center



ABSTRACT

The presentation mainly discusses the application methods and core parameters of artificial intelligence technologies such as perception, decision-making, control algorithm, face and expression recognition in the mass production of autonomous vehicles, and proposes a systematic way of thinking the future application of automotive technologies.

14:00

From Intelligent Parking to Wise Parking

Junqin GE

Marketing Director
ZongMu Tech



ABSTRACT

AVP has become the one the earliest Level 4 AD functions that can be launched in the near future from the industry perspective. China's local OEMs and international and joint venture OEMs are also actively following up the layout. ZongMu Technology, as a leading company of AVP, is going to release some progresses and thinkings of this product. At the same time, we will share the expectation of the synergy of smart city service and parking product.

Highly Efficient AI Computing to Boost Intelligent Vehicles into Supercomputer Era

Stanley LI

Vice President of Business Development & Strategic Planning, Horizon Robotics



ABSTRACT

Software defined vehicle is becoming a trend along with the development of intelligent vehicles. Software oriented architecture is transforming vehicle E/E architecture into centralized supercomputing platform. The key challenge is how to implement high efficient AI computing. It will be discussed how to address the challenge by balancing computing power, power consumption, real-time performance and functional safety.

金陵厅 A

智能交通与车联网

主持人：林 芩 南京航空航天大学

13:40 **深圳车联网（智能网联汽车）实践
与发展思考****刘琪**深圳市智能网联汽车产业创新促进会
秘书长**演讲摘要**

全面概括了深圳在智能网联汽车政策、产业、生态、基础设施、道路测试和应用示范方面已有的工作基础，提出深圳智能网联汽车与智慧交通先行示范的思路。

金陵厅 B

人工智能与无人驾驶

主持人：熊璐 同济大学

**自动驾驶量产中的人工智能算法
应用****郭继舜**广汽研究院
智能驾驶技术部部长**演讲摘要**

主要探讨自动驾驶量产中感知、决策、控制算法和人脸识别，表情识别等人工智能技术的应用方法，技术核心参数等，并提出对未来汽车技术应用的系统性思考。

14:10 **从智能泊车到智慧泊车****葛俊钦**纵目科技
市场总监**演讲摘要**

AVP 已经成为业界公认的能最早落地的 L4 自动驾驶产品功能，中国本土的 OEM 和国际及合资的 OEM 也在积极的跟进布局，纵目科技作为 AVP 的领军企业目前对产品落地的进程与思考。同时分享纵目科技对于将来的智慧城市与泊车产品结合的思考。

**高效能 AI 计算引领汽车驶向超级计
算机时代****李星宇**地平线
市场拓展与战略规划副总裁**演讲摘要**

随着汽车智能化的发展，软件定义汽车已经是大势所趋，基于 SOA(面向服务的构架)的 E/E 架构变革，驱动车载计算向中央计算机迈进，其中的核心挑战在于如何实现高效能 AI 计算。我们将深入讨论如何平衡 AI 计算的算力、功耗、实时性以及可靠性的诸多挑战。

14:40

Semiconductor Help Intelligent Connected Automobile Development

Kevin WU

Director of Applied Technology, Greater China
Infineon



Autonomous Driving Development in GWM

Longbao ZHEN

Senior Engineering Director of Intelligent Driving System Development
Great Wall Motors



ABSTRACT

In order to promote the development of autonomous driving and meet the needs of various industries, GWM has established i-Pilot (intelligent pilot platform) which supports the development of L3, L4 and higher-level autonomous driving systems. The platform integrates autonomous driving essentials such as systems, vehicles, sensing and verification to create safer, more reliable and cost-effective autonomous driving systems that are planned for mass production to facilitate rapid development and adoption of autonomous driving.

15:10

Research on Forward Collision Warning System and Fuzzy Control of the Auto Emergency Braking System

Lei ZHANG ACADEMIC SPEECH

JAC

Experimental and Simulation Big Data Driven Intelligent Driving Research and Development

Yi ZHANG

Product Manager
Wisdplat Software (Shanghai) Co.,Ltd



ABSTRACT

Test and simulation Big data management can drive the development of intelligent driving, breaking the traditional data marginalization, discretization and lag, based on the dynamic management of simulation test data, iterative evolution of experimental data, thus promoting the development of autonomous driving.

15:30 TEA BREAK

16:00

System Safety Engineering in Automated Driving

Yuanning QU

Senior Engineering Manager for Safety & Security CoC Chassis System Control
Bosch Automotive Co.(Suzhou)



Development Status of JAC Intelligent & Connected Vehicles

Weibing LI

Dean of Intelligent & Connected Vehicles Institute
JAC



ABSTRACT

Automated driving lead to an complicated system, which need interdisciplinary & cross domain development. The expected behavior of the complete system (vehicle) especially the new AD/ADAS feature should not have negative impact, and the previous development method is not enough anymore. Besides, Safety and Security as the focus point for cross domain development become more and more important. Several Standards are developed or under development regarding safety and security from ISO/SAE/VDA, e.g. ISO26262, ISO21448, ISO21434, SAE J3061. Integrate the safety and security into system development to ensure an safe system development is our target.

14:40 半导体助力智能网联汽车发展

吴开风

英飞凌

大中华区应用技术总监



长城汽车自动驾驶系统开发

甄龙豹

长城汽车

智能驾驶系统开发部高级工程总监

**演讲摘要**

为更好的推动自动驾驶开发，满足不同行业的需求，长城汽车建立了 i-Pilot- 智慧领航平台，支持 L3、L4 级及更高等级自动驾驶系统开发，该平台整合了系统、车辆、传感、验证等自动驾驶必须项目，以打造更安全、可靠、更具成本优势的自动驾驶系统并将其与量产相结合，促进自动驾驶快速发展、落地。

15:10 汽车紧急制动前碰撞报警系统及模糊控制研究

张雷 论文发表

江淮汽车

试验与仿真大数据驱动自动驾驶研发

张艺

慧勒工程软件（上海）有限公司

产品经理

**演讲摘要**

试验与仿真大数据管理能驱动智能驾驶的研发，打破传统的数据边缘化、离散化和滞后化，基于仿真测试数据的动态管理，对试验数据进行迭代化的演进，从而推动自动驾驶的研发进程。

15:30 茶歇

16:00 系统安全开发在自动驾驶中的运用

曲元宁

博世苏州底盘事业部

功能安全和网络安全能力中心 高级经理



江淮汽车智能网联发展现状

李卫兵

江淮汽车

智能网联汽车研究院院长

**演讲摘要**

自动驾驶导致了更为复杂的系统，需要跨学科，跨领域的合作进行开发。人们期望的整个系统（车辆）的行为，尤其是新的功能不得对现有特性和表现产生不利的影 响，故而以前的开发方法不再足够。此外，作为跨领域关注点的安全则显得更为重要。VDA/SAE/ISO 等标准组织相继出台了或准备出台很多安全相关的标准，诸如 ISO26262,ISO21448, ISO21434, SAE J3061. 将安集成进我们的系统开发中去将是一个必然的趋势。

16:30

Test Challenges and Solutions for Cellular V2X (vehicle-to-everything)

Yang ZHAO

Technical Marketing Manager, Division of Intelligent & Connected Vehicle and New Energy
Keysight



ABSTRACT

Wireless communications promise to enable safer driving and more convenience for autonomous vehicles. Keysight's test and measurement solutions for cellular vehicle-to-everything (C-V2X) help accelerate the design and manufacturing of wireless technologies critical to autonomous driving. C-V2X serves as the foundation for vehicles to communicate with each other and everything around them. The third-generation partnership project (3GPP) in its Release 14 standard defined LTE-V, a C-V2X technology, which supports side-link and vehicle-to-vehicle (V2V) communications. LTE-V and 5G will realize the vision of V2X and the full potential of self-driving vehicles.

17:00

Event-Triggered Robust Controller for an Integrated Motor-Gearbox Powertrain System of a Connected Car under CAN and DOS-Delays

Xiang LI ACADEMIC SPEECH

Beihang University

Full-stack Autonomous Driving Solutions for Mass Production

Qiankun MIAO

Technical Director
Nullmax



ABSTRACT

Nullmax is the leading provider of autonomous driving solutions. With advanced capacity of algorithm development and engineering production, Nullmax cooperates deeply with OEM, Tier1, operator and local government on the landing of autonomous driving. This presentation mainly analyzes the difficulties in autonomous driving landing and discusses the full-stack autonomous driving solutions including perception, planning, control and system, combining the practical experience of Nullmax.

Model Based Development and Testing Methodology of Autonomous Driving System

Hanzhi HUANG

Director of TASS Autonomous Driving Portfolio, Siemens PLM Software



ABSTRACT

The advent of self-driving vehicles means the automotive industry will have to make huge changes. A new product development process is required to produce large quantities of these next-generation vehicles. The system needs to be created in a stable, traceable and highly reliable product development environment.

Solutions and modules in Siemens PLM Software's Simcenter™ portfolio and PreScan product enable design exploration, verification and validation for the development of autonomous vehicles at a systems, software and full vehicle level, using a digital twin of the product and its components, to drive a mature product development process for automated driving.

17:30

Influence Analysis of AEB Two-wheeler on Passenger Car Impact Two-wheeler Traffic Accidents in China

Xingchang WANG ACADEMIC SPEECH

CATARC

The Study of Steering on Ramp Based on Electric Tracked Vehicle

Gen ZENG ACADEMIC SPEECH

China North Vehicle Research Institute

17:50

An Optimal Controller for Trajectory Tracking of Automated Guided Vehicle

Jian ZHANG ACADEMIC SPEECH

Wuhan University of Technology

16:30

C-V2X（车联网）测试挑战和解决方案**赵阳**是德科技 智能网联汽车与新能源事业部
技术市场经理**演讲摘要**

无线通信技术承诺让驾驶变得更安全，让自动驾驶汽车更方便操控。C-V2X 是车辆与车辆之间，以及车辆与其周围所有基础设施之间进行通信的基础。第三代合作伙伴计划（3GPP）在其第 14 版标准中定义了 LTE-V，这是一种 C-V2X 技术，支持侧链路（side-link）和车对车（V2V）通信。LTE-V 和 5G 将实现 V2X 的愿景，充分发挥自动驾驶车辆的潜力。是德科技的蜂窝车联网（C-V2X）解决方案有助于加速设计和推广对自动驾驶至关重要的无线技术。

面向量产的全栈自动驾驶解决方案**苗乾坤**纽劭科技
技术总监**演讲摘要**

纽劭科技是领先的自动驾驶系统整体解决方案提供商，具备世界一流的算法研发和工程量产的技术能力，和国内主流 OEM 厂商、Tier1、运营商、地方政府开展自动驾驶技术量产落地的合作。本报告主要分析目前自动驾驶技术落地过程中遇到的问题，结合纽劭科技的实践经验，探讨可量产的感知、规划、控制、系统等全栈解决方案。

17:00

抵抗 DOS 和 CAN 延时的，基于智能网联车辆电机集成减速器传动系统的事件触发鲁棒速度跟踪控制器设计**李想** 论文发表

北京航空航天大学

基于模型的自动驾驶系统开发和测试方法论**黄汉知**西门子工业软件
TASS 自动驾驶总监**演讲摘要**

自动驾驶时代的到来，给汽车工业界带来巨大的挑战。设计和制造下一代的汽车，需要新的产品开发流程。自动驾驶系统的开发流程和环境必须确保产品性能稳定、可追溯、具备高可靠性。

西门子工业软件的 Simcenter 产品组合和其中的 PreScan 仿真技术，构成虚拟和现实相结合的数字化双胞胎“Digital Twin”，在自动驾驶产品的软件、系统、车辆层面，从早期设计、优化迭代过程、到测试验证等各阶段提供整体仿真设计工具和工程方法，共同应对技术挑战。

17:30

AEB 二轮车系统对中国交通事故的影响性分析**王兴昌** 论文发表

中国汽车技术研究中心有限公司

电传动履带车辆斜坡转向特性研究**曾根** 论文发表

中国北方车辆研究所

17:50

智能汽车路径跟踪最优控制研究**张健** 论文发表

武汉理工大学

October 16

MODERATOR: Chaozhuo CHEN ZongMu Tech

KEYNOTE SPEECH

9:00 **Parallel Cognitive Autonomous Driving and Its Application in Unmanned Mines**
Feiyue WANG

Director, The State Key Laboratory for Management and Control of Complex Systems
 CASIA



ABSTRACT

Autonomous driving is facing with huge challenges in the large-scale application of public roads in the future. This report introduces four aspects of research from the perspective of cognitive decision-making and planning of autonomous driving: the first one is the takeover system in level 3 autonomous driving, and the other is the cognitive decision-making and planning research for V2V interaction based on individual cognition. The 3rd is the research progress of parallel cognitive autonomous driving for intelligent connected driving, and the fourth is the application research in the unmanned mines.

DEVELOPMENT OF ICV ENABLED BY CAPITAL

SPEECH & PANEL

9:45 **Thoughts on Industrial Capital's Contribution to Automotive Industry**
Junhua ZHONG

Deputy General Manager, JMCG
 General Manager, Jiangling Dingsheng Investment Co., Ltd.



ABSTRACT

Automotive sales has entered a cycle of negative growth. Jiangling Capital will share their insights on exerting the advantage of industry capital and where its focus of investment should be.

10:05 **Capital Modernization - Thoughts on Investment in Automotive Industry in Current Environment**
Gong ZHANG

Partner
 Triones Capital



ABSTRACT

A point of view: as we are in the predicament of industry and capital downturns, the role of capital should be reconsidered. We need to take into consideration the big picture of the automobile value chain to make sure our investment is thoroughly and solidly made, and we need to cooperate with key OEMs to achieve long-term stable development.

10:25 TEA BREAK

10月16日

主持人：陈超卓 纵目科技

主旨演讲

9:00 平行认知自动驾驶及其矿山无人化应用

王飞跃

中国科学院自动化研究所

复杂系统管理与控制国家重点实验室主任

**演讲摘要**

自动驾驶在未来开放道路的大规模落地应用面临着巨大挑战。本报告从自动驾驶认知决策与规划的角度，汇报四个方面研究进展：一是 L3 自动驾驶接管系统，二是基于个体认知的单车及车 - 车交互的认知决策与规划研究，三是面向智能网联的平行认知自动驾驶研究进展，四是在矿山无人化中的应用研究。

资本助力智能网联汽车发展

演讲及圆桌

9:45 产业资本助力汽车产业之思索

袁俊华

江铃汽车集团有限公司 副总经理

江铃鼎盛投资有限公司 总经理

**演讲摘要**

汽车销量进入负增长周期，如何发挥出产业资本优势，产业资本的投资关注点在哪里，江铃资本带来他们的思考。

10:05 资本维新——关于当前环境下汽车行业投资的思考

张工

北斗资本

合伙人

**演讲摘要**

针对当前行业冬天资本冬天的困境，思考资本的角色维新，如何从汽车价值链的全局考虑落子，投深、投实、投透，与关键 OEM 协同，实现长期稳定发展。

10:25 茶歇

10:55 **Intelligent Driving – Scenarios Define The Future**

Jinxing LE

Partner
ORIZA



ABSTRACT

The speaker will talk about the status of investment and financing in the primary market of intelligent driving in China and his judgement of the trend.

11:15 **Rebuilding The Order of Vehicle Industry**

Yan CUI

Principle Analyst in Automobile Group
HUAXI SECURITIES



ABSTRACT

China's auto parts industry covers only 4% global market share, highly lower than the 33% market share of the automobile industry. Besides, the global automotive supply chain has been reshaped. The development of auto parts depends on increasing either the sales volume or the unit price. The current strategy to promote both targets is to substitute the imported goods using our domestic branded car parts. To be specific, the sales volume could be raised by attracting overseas customers and the price by developing high-end product. Under the circumstance of technological development and policy support, the trend of automotive intelligent network integration is accelerating, and industry changes are underway. So, how should Chinese car parts companies follow the trend to make big achievements?

11:35 **Panel: Development of ICV Enabled by Capital**

12:15 LUNCH

Jingling Hall A

Sensors, Multi-Sensory Fusion and Perception

MODERATOR: Hui ZHANG

Behang University

Jingling Hall B

Testing and Validation

MODERATOR: Dawei PI

Nanjing University of Science and Technology

13:30 **Requirements of 77GHz Radar and ADAS System Development for Mass Production**

Jie BAI

Professor, Tongji University
President, Suzhou Millimeter-wave Technology Co., Ltd.



Danger Analysis and Closed Field Testing Technology of Autonomous Driving

Dehai LI

Testing Technology Manager
Shenzhen Future Intelligent Connected Transportation System Industry Innovation Center



ABSTRACT

- Demand for the functions and performance of ADAS System
- Performance of foreign 77GHz radar
- 77GHz millimeter-wave radar and ADAS system
- Benchmarking 77GHz millimeter-wave radar against foreign ADAS system

ABSTRACT

Testing and validation are becoming the bottleneck of the development of autonomous driving technologies. To solve these questions, data-based or knowledge-based analysis methods could help, while a complete test tool chain is needed for multiple scenarios tests. Shenzhen Intelligent and Connected Transportation System Verification Area is oriented to the industry needs, will construct '3 zones and 5 platforms' comprehensive ability for testing and demonstration, focusing on building an integral approach for AVs' R&D, testing, verification and implement, to promote the development of intelligent connected transportation industry.

10:55 智能驾驶——场景定义未来

乐金鑫

元禾原点

合伙人

**演讲摘要**

演讲人主要分享国内智能驾驶领域一级市场上的投融资现状及趋势判断。

11:15 重塑汽车产业秩序

崔琰

华西证券

汽车行业首席分析师

**演讲摘要**

中国零部件与整车产业地位完全不匹配（全球份额 4% vs 33%），全球供应链重塑。零部件成长依靠提升配套量 / 单车价值量，现阶段能实现双向增长的路径集中于进口替代，自主零部件供应商通过开拓合资或海外客户，开发高端产品，实现量价齐升。在技术发展和政策助推下，汽车智能网联化趋势加快，行业巨变正在进行中，零部件厂商又该如何与趋势共舞实现崛起？

11:35 圆桌：资本助力智能网联汽车发展

12:15 午餐

金陵厅 A

传感器、多传感融合与感知

主持人：张辉 北京航空航天大学

金陵厅 B

测试与验证

主持人：皮大伟 南京理工大学

13:30 77GHz 毫米波雷达与 ADAS 系统国产化的性能与要求

白杰

同济大学 教授

苏州豪米波技术有限公司 董事长

**演讲摘要**

- ADAS System 的功能与性能需求
- 国外 77GHz 雷达的性能
- 毫米波的 77GHz 雷达与 ADAS 系统
- 毫米波的 77GHz 雷达与国外 77GHz 雷达的对标

自动驾驶系统危险分析与封闭场地测试技术

李德海

深圳市智能网联交通系统产业创新中心

测试技术部经理

**演讲摘要**

测试与验证是自动驾驶汽车技术发展的关键问题，该问题可以借助基于数据或理论的分析方法，同时构建完整测试工具链，对各类场景开展测试。深圳智能网联交通测试示范区面向产业需求，将建设“三区五平台”综合测试示范能力，着力打造智能网联汽车研发、测试到示范落地的完整通道，推动智能网联交通产业发展。

14:00

Smart LiDAR Sensor System for ADAS & AD

Leilei Shinohara

Vice President
RoboSense LiDAR



ABSTRACT

The safety of autonomous driving is very important. For ADAS, it is essential to ensure safety while assisting the driver during driving. Taking the Audi A8 model as an example, a complete assistance system includes a variety of sensors such as cameras, ultrasonic radar, LiDAR, ect.

A small perception fault during driving may result in serious consequences, which in return will also impede the development of autonomous driving and the ADAS industry. LiDAR as redundancy, it is the key to ensure the safety of each module.

At present, LiDAR is still at its very early stage of development, and its development is closely related to various factors, such as packaging size, vehicle integration, mass production, reliability, cost and more.

Autonomous Driving Test and Industrial Practice

Qiong WU

Executive Vice President
Beijing Innovation Center for Mobility Intelligent



ABSTRACT

With the evolution of transportation, the intelligent&connected industry came into being and entered the era of intelligent mobility. Beijing and Hebei signed with the Ministry of Industry and Information Technology to establish a national-level application demonstration zone. The work includes the establishment of a national ICV&ICT (Beijing&Hebei) demonstration zone, a Innovation center, Connected-Vehicle-Future-Fund and Zhongguancun-Transportation-Industry-Alliance. By the end of August 2019, a temporary license plate for road tests for autonomous driving vehicles had been issued for 72 vehicles in 11 companies.

14:30

Hierarchical Safety Architecture Design in HAD System

Lucy SONG

System & Safety Director
iMotion



ABSTRACT

According to SOTIF and functional safety methodology, in the intelligent driving system, try to realize the hierarchical safety architecture design by means of simulation analysis. Static parameters and dynamic parameters of environment are modeled in simulation tool-chain. The safety zone and fallback system are involved in hierarchical safety architecture design to solve the AI algorithm uncertainty and limitation of sensor application in the whole product design.

The ICV Pilot Zone in Shanghai Propels The Adoption of Autonomous Driving

Runqing GUO

Deputy General Manager
Shanghai SH Intelligent Automotive Technology Co., Ltd.



ABSTRACT

The speaker will share the practices of the establishment of close-zone test evaluation system, semi-open park pilot application platform, open road test operation platform and Chinese traffic holographic scenario library since the foundation of Shanghai Pilot Zone in June, 2016.

15:00

Modification of Density-based Clustering and Threshold Adjustment Detection-tracking Integration Algorithm for 77GHz Automotive Radar

Houyuan ZHANG ACADEMIC SPEECH

Harbin Institute of Technology

The Impact of Attitude Feedback on the Control Performance and Energy Consumption in the Path-Following of Unmanned Rollers

Wei ZHAN ACADEMIC SPEECH

Tianjin University

15:20

TEA BREAK

14:00

**为高级辅助驾驶和自动驾驶打造
的智能激光雷达传感系****篠原磊磊**速腾聚创
研发副总裁**演讲摘要**

自动驾驶的安全性非常重要，ADAS 其在辅佐驾驶员驾驶的同时并保证安全至关重要。以奥迪 A8 款汽车为案例，一个完整的辅助系统包含了摄像头、超声波雷达、激光雷达等各种各样的传感器设备。

汽车在行驶过程中一旦发生感知方面的失误将导致严重的后果，这也会对自动驾驶与 ADAS 产业的发展造成影响，而激光雷达作为补充的冗余，是确保每一个板块是安全的关键。

目前激光雷达的发展正处于前期的阶段，其发展与封装尺寸、汽车集成、量产性、可靠性以及成本等方面息息相关。

自动驾驶测试与产业实践之路**吴琼**北京智能网联汽车创新中心
常务副总经理**演讲摘要**

随着交通工具的演进，智能网联产业应运而生，进入智慧出行时代。北京、河北与工信部签约成立国家级应用示范区，工作内容包括一个建立国家智能汽车与智慧交通（京冀）示范区、创新中心、车联网未来基金及中关村交通产业联盟。截止 2019 年 8 月底，已为 11 家企业 72 辆车发放自动驾驶车辆道路测试临时号牌。

14:30

**智能驾驶系统中的层次化安全
架构设计****宋炜瑾**知行科技
系统安全总监**演讲摘要**

介绍了依照预期安全及功能安全的方法，在智能驾驶系统中，尝试通过仿真分析手段导入静态和动态环境参数，构建安全区域，触发后备系统，实现层次化的安全架构设计，来解决整个产品设计过程中人工智能算法内含的不确定性和传感器应用的限制问题。

**上海智能网联汽车示范区推动自动
驾驶落地之路****郭润清**上海淞泓智能汽车科技优先公司
副总经理**演讲摘要**

分享自 2016.6 月成立以来，上海示范区构建封闭区测试评价体系、半开放园区示范应用平台、开放道路测试运营平台和中国交通全息场景库的实践之路

15:00

**77GHz 汽车雷达归一化密度聚类和门限调整的监测
跟踪融合算法****张厚元** 论文发表

哈尔滨工业大学

**姿态反馈对无人驾驶压路机路径跟踪控制品质和能
耗的影响研究****占威** 论文发表

天津大学

15:20

茶歇

Jingling Hall A

Sensors, Multi-Sensory Fusion and Perception

MODERATOR: Hui ZHANG

Behang University

Jingling Hall B

Map and Positioning

MODERATOR: Dawei PI

Nanjing University of Science and Technology

15:50

Key Technologies of Millimeter Wave Radar Sensor in Intelligent Transportation System (ITS) and Their Development

Hui ZHANG

CTO, HawkEye



ABSTRACT

Millimeter wave radar sensor is playing an increasingly important role in ITS. From the large-scale application of vehicle-mounted millimeter wave radar to the emerging popularity of millimeter wave traffic radar, millimeter wave radar sensor is shaping the future of ITS. To meet the demand of applications, millimeter wave radar sensor is also going through rapid technology iteration and development. Starting from some key technologies of 77GHz millimeter-wave radar, the report explains the mainstream technologies of millimeter-wave radar and their applications, attempting to picture the development paths and trends of millimeter wave radar sensor in ITS.

Precise Time-space Service for Intelligent Driving

Jinfei NIAN

General Manager

Qianxun SI



ABSTRACT

Precise time and space (time+space) information is crucial for the development of intelligent driving, which involves hardware, terminal algorithm, services and many other problems. Since we have “no regulation to rely on and no experience to draw from,” Qianxun’s intelligent time and space technology provides an integrated solution of service, algorithm and hardware to meet the demands for pre-installed applications compliant with precise, reliable and safe service standards.

16:20

Parameter Estimation of Non-paved Roads for ICVs Using 3D Point Clouds

Kangjian YAN ACADEMIC SPEECH

Hunan University

Open Cooperation and Co-construction Standards of China HAD Map

Debin ZOU

Dean of CVIS Institute, Navinfo



ABSTRACT

- HAD Map and Development (Production and Application)
- International Standards Families of HAD Map
- The Necessity of Establishing China Standards of HAD Map
- Proposal of the Construction Scheme for China Standards of HAD Map

16:50

A New CFAR Detection Algorithm Based on Sorting Selection for Vehicle Millimeter Wave Radar

Ruida CHEN ACADEMIC SPEECH

Harbin Institute of Technology

An Real-time Obstacle-avoidance Trajectory Planner for on-Road Autonomous Vehicle

Dequan ZENG ACADEMIC SPEECH

Tongji University

BEST PAPERS AWARD

金陵厅 A

传感器、多传感融合与感知

主持人：张辉 北京航空航天大学

金陵厅 B

地图与定位

主持人：皮大伟 南京理工大学

15:50

智能交通中的毫米波雷达传感器关键技术与发展**张慧**

隼眼科技

首席技术官

**演讲摘要**

智能交通中毫米波雷达传感器承担了越来越重要的角色，从车载毫米波雷达大规模的应用，到毫米波交通雷达的方兴未艾，毫米波雷达传感器正在深刻参与改变智能交通领域的未来形态。基于应用的需求，毫米波雷达传感器也在经历快速的技术迭代与发展，报告从 77GHz 毫米波雷达的部分关键技术入手，阐述毫米波雷达传感器的主流技术与应用，试图勾勒出智能交通雷达中毫米波雷达传感器的发展路径与发展趋势。

面向智能驾驶的精准时空服务**年劲飞**

千寻位置

总经理

**演讲摘要**

精准的时空（时间 + 空间）信息对于智能驾驶的发展至关重要，涉及到硬件、终端算法、服务等诸多方面的问题，当前的现状是“无规可依，无物可用”，千寻的时空智能技术就是提供包括服务、算法、硬件的一体化解决方案，以精准、可靠、安全的服务标准，满足车规级前装应用需求。

16:20

基于三维激光点云的非铺装路面特征参数估计**严康健** 论文发表

湖南大学

开放合作、共建标准——中国自动驾驶地图标准体系建设**邹德斌**

四维图新

车路协同研究院院长

**演讲摘要**

- 高精地图技术与应用（生产与应用）
- 高精地图国际标准体系
- 建立高精地图中国标准的必要性
- 高精地图中国标准建设方案建议

16:50

基于排序选择的车载毫米波雷达恒虚警检测新算法**陈锐达** 论文发表

哈尔滨工业大学

道路自主车辆实时避障轨迹规划**曾德全** 论文发表

同济大学

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www.forum8.co.jp/chinese/

FORUM8公司创业以来以软件包开发技术为基础,以结构物设计为首,提供支援土木、建筑设计的软件、技术服务。近年来随着虚拟现实的开发,应用范围延伸到包括交通、汽车研发等更广泛的项目领域。

本公司的成长基础在于独创性通用软件的开发。UC-win/Road作为一款实时虚拟现实软件开发于2000年,从初版发布以来,不断开发完善丰富的三维场景建模、驾驶模拟和演示等功能。

这些新产品、新技术的开发获得了外界的高度评价,先后获得日本经济产业省的委托研究、NEDO的助成项目。以软件相关的技术服务、软件本身为核心的集成业务也以驾驶模拟器系统等为首不断成长,先后成功拿下中国交通部公路科学院的大型模拟器的国际投标,丰田公司、九州大学、京都大学的高端研究用驾驶模拟器等业务。

FORUM8 Technology Development (Shanghai) Co., Ltd.

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www.forum8.com

Since the company's foundation, FORUM8 have been providing software and technical services that support civil engineering and chitectural/structural design.Our recent developments in Virtual Reality software have lead to any new applications especially those in traffic and automobile research. In fact, FORUM8's VR technology is being utilized in those researches and indeed just about any type of project.

Since year 2000, we have been continuously enhancing our premier 3D VR software UC-win/Road and three dimensional analysis program UC-win/FRAME(3D).

Since the evaluation on the our development for these new products and new technologies is notably high from outside of the company, we even received an aid fund from Ministry of Economy for consigned development and NEDO.Moreover, technical service for our software and integration work with our software as a core such as driving simulator, are making further growth and improvements. Our recent success include being picked by the Chinese Traffic and Transport Department through international tender as the only successful candidate capable of delivering a large driving simulator that meets their criteria, and receiving an order of driving simulator designed for high level research from Kyushu University and Kyoto University not to mention the huge order of a very large driving simulator from the aforementioned department.



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更多信息,请访问 www.keysight.com。

Keysight Technologies, Inc.

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www.keysight.com

Keysight Technologies, Inc. (NYSE: KEYS) is a leading technology company that helps enterprises, service providers, and governments accelerate innovation to connect and secure the world. Keysight's solutions optimize networks and bring electronic products to market faster and at a lower cost with offerings from design simulation, to prototype validation, to manufacturing test, to optimization in networks and cloud environments. Customers span the worldwide communications ecosystem, aerospace and defense, automotive, energy, semiconductor and general electronics end markets. Keysight generated revenues of \$3.2B in fiscal year 2017. In April 2017, Keysight acquired Ixia, a leader in network test, visibility, and security.

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昆易电子科技(上海)有限公司
Kunyi electronics technology (Shanghai) co., LTD

昆易电子科技(上海)有限公司

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www.vcarsystem.com

昆易电子科技(上海)有限公司成立于2010年,从事嵌入式软件开发测试、总线开发测试设备研发、生产和销售,服务于汽车、轨道交通、电力等市场,助力全球企业研发。

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Founded in 2010, Kunyi Electronic Technology (Shanghai) Co., Ltd. is engaged in the development, production and sales of embedded software and hardware development and testing. Serving the automotive, rail transit, electric power and other markets, helping global enterprises to have cutting edge R&D tool chain.

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