



IEEE
IV 2023
IEEE INTELLIGENT VEHICLES SYMPOSIUM
Anchorage, Alaska, USA // June 4 – 7, 2023



IEEE IV
2023
SYMPOSIUM
PROGRAM

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Welcome to the IEEE Intelligent Vehicles Symposium, 2023
Welcome to Anchorage

Dear IEEE ITSS members,
Dear Colleagues,

I am truly honored and delighted to welcome you to the 34th IEEE Intelligent Vehicles Symposium, in the period June 4-7, 2023, Anchorage, Alaska, USA. I believe we have chosen a venue that guarantees a highly successful technical symposium immersed in the unique culture and scenery of Alaska.

Since its inception in 1990, the IEEE IV has been the premier event that attracts world class experts and researchers from academia and industry alike. This year technical program comprises of 306 accepted technical papers, 19 workshops, 6 tutorials, 2 Plenary Speeches and one Plenary Panel. The program is split between 4 parallel oral and poster sessions a day, We also expect to provide abundant opportunities for members and attendees to meet, greet, and informally network.

During this year's Symposium, we introduce, and for the first time in the IEEE IV history, the F1Tenth competition and an Automotive Game Day competition.

As the IEEE IV 2023 Symposium general chair, I recognize that the success of the Symposium depends ultimately on the many people who worked with us in planning and organizing the technical program and assisting in the social program arrangements. In particular, I would like to thank the technical Program Co-Chairs for their valid remarks and recommendations as well as the brilliant suggestions on organizing the technical program. I also wish to thank all the Organizing Committee members for their input and timely responses to matters of high importance to the Symposium.

Special thanks go to the authors, associate editors and the reviewers of the technical papers, workshops, and tutorial.

Our highest regards to the sponsors for their generous donations who have helped us to keep down the costs of Symposium for all participants.

I hope you have a productive and successful conference.

Sincerely,

Dr. Saif alZahir, General Chair

Organizing Committee



Saif alZahir
Concordia University, Montreal, Canada
General Chair



Brendan Morris
University of Nevada, Las Vegas, USA
Industry Chair



Johannes Betz
Technische Universität München, Germany
Tutorial Co-Chair



Kenrick Mock
University of Alaska Anchorage, USA
Co-General Chair



Nobuyuki Ozaki
Nagoya University, Japan
Industry Co-Chair



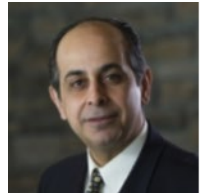
Ahmed Hussein
IAV GmbH, Germany
Workshops Chair



Frederic Dufaux
CNRS, France
Technical Program Co-Chair



Rony Ferzli
Intel Corporation, USA
Competition Challenge Co-Chair



Osama Abaza
University of Alaska Anchorage, USA
Local Arrangements Co-Chair



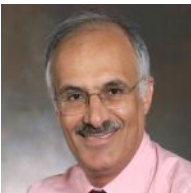
Meng Lu
Peek Traffic B.V., Netherlands
Technical Program Co-Chair



Ignacio Alvarez
Intel, USA
Competition Challenge Co-Chair



Hala Abudalfa
McGill University, Canada
Students Activities Co-Chair



Sohail Dianat
Rochester Institute of Technology, USA
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Plenary Speaker – Ioannis Pitas
Human-centered AI for Intelligent Vehicles
Monday, June 5 13:40 - 14:40, Room: Tikahtnu CDEF
Moderator: Frederic Dufaux (CNRS, France)



Ioannis Pitas

Professor at the Department of Informatics of AUTH and Director of the Artificial Intelligence and Information Analysis (AIIA) lab

Intelligent/autonomous vehicles, such as self-driving cars, intelligent robots and Unmanned Aerial Vehicles (UAVs) must seamlessly interact with humans, e.g., their drivers/operators/pilots or people in their vicinity, whether being obstacles to be avoided (e.g., pedestrians) or targets to be followed and interact with (e.g., when filming a performing athlete). Furthermore, intelligent vehicles and robots have been increasingly employed to assist humans in real-world applications (e.g., for, autonomous transportation, warehouse logistics, or infrastructure inspection). To this end, autonomous vehicles should be equipped with advanced vision systems that allow them to understand and interact with humans in their surrounding environment. This lecture overviews human-centric AI methods that can be utilized to facilitate visual interaction between humans and autonomous vehicles (e.g., through gestures captured by RGB cameras), in order to ensure their safe and successful cooperation in real-world scenarios. Such methods should: a) demonstrate increased visual perception accuracy to understand human visual cues, b) be robust to input data variations, in order to successfully handle illumination/background/scale changes that are typically encountered in real-world scenarios, and c) produce timely predictions to ensure safety, which is a critical aspect of autonomous vehicles' applications. Deep learning and neural networks play an important role towards this end, covering the following topics: a) human pose/posture estimation from RGB images, b) human action/activity recognition from RGB images/skeleton data, and c) gesture recognition from RGB images/skeleton data. Finally, embedded execution is extremely important, as it facilitates vehicle autonomy, e.g., in communication-denied environments. Application areas include driver/operator/pilot activity recognition, gesture-based control of autonomous vehicles, or gesture recognition for traffic management. The lecture will offer an overview of all the above plus other related topics and will stress the related algorithmic aspects. Some issues on embedded CNN computation (e.g., through fast convolution algorithms) will be overviewed as well.

Bio

IEEE fellow, IEEE Distinguished Lecturer, EURASIP fellow. He received the Diploma and PhD degree in Electrical Engineering, both from the Aristotle University of Thessaloniki (AUTH), Greece. Since 1994, he has been a Professor at the Department of Informatics of AUTH and Director of the Artificial Intelligence and Information Analysis (AIIA) lab. He served as a Visiting Professor at several Universities. His current interests are in the areas of computer vision, machine learning, autonomous systems, intelligent digital media, image/video processing, human-centred computing, affective computing, 3D imaging and biomedical imaging. He has published over 920 papers, contributed to 45 books in his areas of interest and edited or (co-)authored another 11 books. He has also been member of the program committee of many scientific conferences and workshops. In the past he served as Associate Editor or co-Editor of 13 international journals and General or Technical Chair of 5 international conferences. He delivered 98 keynote/invited speeches worldwide. He co-organized 33 conferences and participated in technical committees of 291 conferences. He participated in 73+ R&D projects, primarily funded by the European Union and is/was principal investigator in 43 such projects. He is the coordinator of the Horizon Europe R&D project TEMA, AUTH principal investigator in H2020 R&D projects Aerial Core, AI4Media (one of the 4 H2020 ICT48 AI flagship projects) and Horizon Europe R&D projects AI4Europe, SIMAR. He is chair of the International AI Doctoral Academy (AIDA) <https://www.i-aida.org/>. He was chair and initiator of the IEEE Autonomous Systems Initiative <https://ieeeseasi.signalprocessingsociety.org/>. Prof. Pitas leads the big European H2020 R&D project MULTIDRONE: <https://multidrone.eu/> He has 35200+ citations to his work and h-index 88+. According to <https://research.com/> he is ranked first in Greece and 319 worldwide in the field of Computer Science (2022).

Plenary Speaker – Stephen Smith
Towards Safe Autonomy that can Learn User Preferences
Tuesday, June 6 13:40 - 14:40, Room: Room: Tikahtnu CDEF
Moderator: Chair: Fawzi Nashashibi (INRIA, France)



Stephen Smith

Professor in Electrical and Computer Engineering at the University of Waterloo, Canada

The potential of intelligent vehicles is enormous. They can reduce accidents, save lives of humans by greatly reducing accidents, and can provide a new mode of transportation for people incapable of driving. Moreover, through mobility-on-demand transportation, autonomy can increase the utilization of vehicles in cities, greatly reducing the amount of land devoted to parking vehicles. To achieve this future, we need intelligent vehicles that are both safe and that people are happy and comfortable using. In this talk, I will discuss our recent work on both issues. We will discuss methods to plan safe motion for vehicles through risk aware planning. We will also discuss how remote human supervisors can be leveraged to improve the safety of an autonomous fleet by taking over control of a vehicle at key moments in time. We will then talk about our research in tailoring the behaviour of a vehicle to specific users or passengers. The key to doing this is a method called active preference learning, whereby we demonstrate different vehicle behaviours to a user, and use their feedback to learn a model of their underlying preferences. This preference model can be used to tailor autonomous system to a particular user, making users more comfortable with autonomy.

Bio

Stephen L. Smith is a Professor in Electrical and Computer Engineering at the University of Waterloo, Canada, where he holds a Canada Research Chair in Autonomous Systems. He is a faculty affiliate with the Vector Institute for Artificial Intelligence, and the Director of the Autonomous Systems Lab. Prior to Waterloo, he was a postdoc in the Computer Science and Artificial Intelligence Lab (CSAIL) at MIT. He received his BSc degree from Queen's University, his MSc degree from the University of Toronto, and his PhD degree from the University of California, Santa Barbara.

Prof. Smith is a Professional Engineer and serves as an advisor for several startups in transportation systems and robotics including RideCo, Swap Robotics, and Veerio Robotics. He is on the editorial board of the IEEE Transactions of Robotics, the IEEE Transactions on Control of Network Systems, and the IEEE Open Journal of Systems and Control. He has served or is serving on the organizing committee for the 2024 American Control Conference, the 2021 IEEE International Conference on Robot and Human Interactive Communication (RO-MAN) and the 2026 International Symposium on the Mathematical Theory of Networks and Systems. Prof. Smith has received several awards including the Early Researcher Award from the Province of Ontario, the NSERC Discovery Accelerator Supplement Award, and two Outstanding Performance Awards from the University of Waterloo. His main research interests lie in control and optimization for autonomous systems, with a focus on safe motion planning, future mobility-on-demand systems, and the interaction of humans with autonomy.

Tutorials

An Introduction to Autoware and Its Application Platforms

- Organizer: The Autoware Foundation
- Presenters: Christian John, Rahul Mangharam, Zhijie Qiao
- Tutorial Type: Half-day Tutorial (3 hours)
- [Website](#)

A holistic view of perception in Intelligent Vehicles – Data Collection, Interpretation, and Prediction

- Organizer: Georgia Tech University
- Presenter: Ghassan Alregib, Mohit Prabhushankar
- Tutorial Type: Full-day Tutorial (6 hours)
- [Website](#)

Tightly Coupled INSS (GNSS & INS) for Autonomous System Outdoor Localization

- Organizer: UC San Diego
- Presenter: Jack Silberman, Daniel Gruver
- Tutorial Type: Half-day Tutorial (3 hours)

Reliable State Estimation and Distributed Controls in Intelligent Vehicular Networks

- Organizer: University of Alberta
- Presenter: Ehsan Hashemi, Arunava Banerjee, Neel Bhatt
- Tutorial Type: Half-day Tutorial (3 hours)
- [Website](#)

Constrained Control of Multi-Vehicle Systems for Smart Cities and Industry 4.0: from Model Predictive Control to Reinforcement Learning

- Organizer: University of Calabria, Concordia University
- Presenter: Dr. Giuseppe Franze, Dr. Walter Lucia
- Tutorial Type: Half-day Tutorial (3 hours)
- [Website](#)

Security of Emergent Autonomous Vehicles: From Sensors to Systems

- Organizer: University of Florida
- Presenter: Sandip Ray
- Tutorial Type: Half-day Tutorial (3 hours)

From	To	Room: SPURR	Room: O'MALLEY
08:00	11:00	T01 An Introduction to Autoware and Its Application Platforms	T04 Reliable State Estimation and Distributed Controls in Intelligent Vehicular Networks
11:30	14:30	T02 A holistic view of perception in Intelligent Vehicles – Data Collection, Interpretation, and Prediction	T05 Constrained Control of Multi-Vehicle Systems for Smart Cities and Industry 4.0
15:00	18:00	T03 Tightly Coupled INSS (GNSS & INS) for Autonomous System Outdoor Localization	T06 Security of Emergent Autonomous Vehicles: From Sensors to Systems

Workshops

Half-Day Workshops

WS02 - Workshop on Bridging the Gap between Map-based and Map-less Driving

- Organizer(s): Frank Bieder, Richard Fehler, Fabian Immel, Ömer Şahin Taş, and Martin Lauer
- Website: <https://www.mrt.kit.edu/mb2ml/>

WS03 - Workshop on Safety Testing and Validation of Connected and Automated Vehicles

- Organizer(s): Bowen Weng, Henry Liu, and Feng Shuo
- Website: <https://sites.google.com/umich.edu/ieee-iv-2023-safety>

WS04 - Workshop on Ensuring and Validating Safety for Automated Vehicles (EVSAV)

- Organizer(s): Marcus Nolte, Ignacio Alvarez, Krzysztof Czarnecki, Arnaud de la Fortelle, Nacer Eddine, Chris Gerdes, Jia Hu, Mykel Kochenderfer, Marco Pavone, Markus Maurer, Maximilian Naumann, Fabian Oboril, Christoph Stiller, Torben Stolte, Martin Törngren, and Hong Wang
- Website: <https://www.tu-braunschweig.de/iffr/evsav>

WS05 - Workshop on Development of Socially-Compliant Driving for AVs to Enhance Safety and Efficiency in Mixed Traffic

- Organizer(s): Yongqi Dong, Haneen Farah, Chen Tang, Peng Hang, Oscar de Groot, and Laura Ferranti
- Website: <https://sites.google.com/berkeley.edu/iv2023>

WS06 - Workshop on Socially Interactive Autonomous Mobility (SIAM)

- Organizer(s): Wenshuo Wang, Jiachen Li, Chengyuan Zhang, Letian Wang, Daniel Omeiza, Mushuang Liu, Changliu Liu, and Lijun Sun
- Website: <https://interactive-driving.github.io>

WS07 - Workshop on Social and Interactive and Safe Behaviors for Intelligent Vehicles: Benchmark, Models, and Applications

- Organizer(s): Zirui Li, Xinwei Wang, Xiaolin He, Meng Wang, Chao Lu, and Jianwei Gong
- Website: <https://sites.google.com/view/iv2023-social>

WS08 - Workshop on Human Factors in Intelligent Vehicles

- Organizer(s): Cristina Olaverri-Monreal, Fernando Garcia, and Elmar Matthes
- Website: <http://hfiv.net>

WS09 - Workshop on Internet of Things in Intelligent Transportation Systems

- Organizer(s): Yongkang Liu, Dawei Chen, Qi Chen, Haoxin Wang, and Ziran Wang
- Website: <https://iot-in-its.github.io/iv2023>

WS10 - Workshop on Scenario Generation for Testing Autonomous Vehicles

- Organizer(s): Ishaan Paranjape, Abdul Jawad, Golam Md. Muktadir, Jim Whitehead, and Alessio Gambi
- Website: <https://sites.google.com/ucsc.edu/iv2023>

WS11 - Workshop on Naturalistic Driving Data Analytics (NDDA)

- Organizer(s): Pujitha Gunaratne, Anuj Sharma, and Vinod Vasudevan
- Website: <https://sites.google.com/view/ndda-2023/home>

WS11 - Workshop on Naturalistic Driving Data Analytics (NDDA)

- Organizer(s): Pujitha Gunaratne, Anuj Sharma, and Vinod Vasudevan
- Website: <https://sites.google.com/view/ndda-2023/home>

WS12 - Workshop on Autonomy@Scale

- Organizer(s): Larissa Triess, Cristobal Curio, and Saqib Bukhari
- Website: <https://sites.google.com/view/autonomyatscale2023>

WS13 - Workshop on In-cabin Human Sensing in Intelligent Vehicles

- Organizer(s): Udara Manawadu, Mitsuhiro Kamezaki, Pujitha Gunaratne, and Shunichiroh Sawai
- Website: <https://sites.google.com/view/hsiv-workshop>

WS14 - Workshop on Cyber-Physical Mobility (CPM) Olympics

- Organizer(s): Armin Mokhtarian and Bassam Alrifaae
- Website: <https://cpm-remote.embedded.rwth-aachen.de/olympics/2022>

WS19 - Workshop on Interaction-driven Behavior Prediction and Planning for Autonomous Vehicles

- Organizer(s): Sascha Hornauer, Maximilian Naumann, Eike Rehder, Jiachen Li, Wei Zhan, Martin Lauer, Masayoshi Tomizuka, Arnaud de La Fortelle, and Christoph Stiller
- Website: <https://kit-mrt.github.io/iv2023-workshop>

Workshops

Full-Day Workshops

WS15 - Workshop and Industry Panel on Cooperative and Automated Driving

- Organizer(s): Meng Lu
- Website: <https://sites.google.com/ieee-itss.org/iv23-workshop-coop-driving>

WS16 - Workshop on 3D-Deep Learning for Autonomous Driving (3D-DLAD)

- Organizer(s): B. Ravi Kiran, Abhinav Valada, Xinshuo Weng, Jiachen Li, Bangalore Ravi Kiran, Hazem Rashed, Varun Ravi Kumar, Senthil Yogamani, and Agapius Bou Ghosn
- Website: <https://sites.google.com/view/3d-dlad-v5-iv2023>

WS18 - Workshop on Autoware – ROS-based OSS for Autonomous Driving

- Organizer(s): Alexander Carballo, Shinpei Kato, Rahul Mangharam, and Venkat N. Krovi
- Website: <https://www.autoware.org/iv2023>

WS20 - Workshop on Data Driven Intelligent Vehicle Applications (DDIVA)

- Organizer(s): Walter Zimmer, Christian Cress, Emec Ercelik, Neslihan Kose Cihangir, Fabian Oboril, and Bernd Gassmann
- Website: <https://www.ce.cit.tum.de/air/research/ddiva/ddiva23>

WS21 - Workshop on Remote Operation of Intelligent Connected and Automated Road Vehicles

- Organizer(s): Maytheewat Aramrattana, Jonas Jansson, Andreas Schrank, and Michael Oehl
- Website: <https://www.vti.se/rvt>

Workshop Program

From	08:30	09:50	11:20	12:40	13:40	14:40	16:00
To	09:50	11:20	12:40	13:40	14:40	16:00	17:50
Room 1	<u>WS08 – Workshop on Human Factors in Intelligent Vehicles</u>			Lunch Break	<u>WS07 – Workshop on Social and Interactive and Safe Behaviors for Intelligent Vehicles: Benchmark, Models, and Applications</u>		
Room 2	<u>WS11 – Workshop on International Workshop on Naturalistic Driving Data Analytics (NDDA)</u>				<u>WS13 – Workshop on In-cabin Human Sensing in Intelligent Vehicles</u>		
Room 3	<u>WS12 – Workshop on Autonomy@Scale</u>				<u>WS14 – Workshop on Cyber-Physical Mobility (CPM) Olympics</u>		
Room 4	<u>WS04 – Workshop on Ensuring and Validating Safety for Automated Vehicles (EVSAV)</u>				<u>WS03 – Workshop on Safety Testing and Validation of Connected and Automated Vehicles</u>		
Room 5	<u>WS06 – Workshop on International Workshop on Socially Interactive Autonomous Mobility (SIAM)</u>				<u>WS05 – Workshop on Development of Socially-Compliant Driving for AVs to Enhance Safety and Efficiency in Mixed Traffic</u>		
Room 6	<u>WS02 – Workshop on Bridging the Gap between Map-based and Map-less Driving</u>				<u>WS10 – Workshop on Scenario Generation for Testing Autonomous Vehicles</u>		
Room 7	<u>WS19 – Workshop on Interaction-driven Behavior Prediction and Planning for Autonomous Vehicles</u>				<u>WS09 – Workshop on Internet of Things in Intelligent Transportation Systems</u>		
Room 8	<u>WS15 – Workshop and Industry Panel on Cooperative and Automated Driving</u>				<u>WS15 – Workshop and Industry Panel on Cooperative and Automated Driving</u>		
Room 9	<u>WS16 – Workshop on 3D-Deep Learning for Autonomous Driving (3D-DLAD)</u>				<u>WS16 – Workshop on 3D-Deep Learning for Autonomous Driving (3D-DLAD)</u>		
Room 10	<u>WS18 – Workshop on Autware – ROS-based OSS for Autonomous Driving</u>				<u>WS18 – Workshop on Autware – ROS-based OSS for Autonomous Driving</u>		
Room 11	<u>WS20 – Workshop on Data Driven Intelligent Vehicle Applications (DDIVA)</u>				<u>WS20 – Workshop on Data Driven Intelligent Vehicle Applications (DDIVA)</u>		
Room 12	<u>WS21 – Workshop on Remote Operation of Intelligent Connected and Automated Road Vehicles</u>				<u>WS21 – Workshop on Remote Operation of Intelligent Connected and Automated Road Vehicles</u>		

Plenary Panel

Future Directions on In-cabin Sensing Technology: Challenges and Opportunities
Tuesday, June 6 9:50 - 11:20, Room: Tikahtnu CDEF



Hadj Hamma Tadjine
Business Director
IAV GmbH, Berlin, Germany

He (Senior Member, IEEE) received the PhD degree in computer science from the Clausthal University of Technology, Clausthal, Germany. From 2000 to 2004, he was an Assistant Professor at the Clausthal University of Technology and from 2004 to 2006, at the CUTEC Institute GmbH, Clausthal, Germany. From 2006 to 2008, he was responsible for advanced driver assistance systems at Hella Aglaia, Berlin, Germany. From 2008 to 2010, he was responsible for advanced driver assistance systems and parking assistance systems at IAV GmbH, Berlin. Currently, he is the Business Director for technical strategy in the area of intelligent driving systems. He has a track record of fundamental research on these topics documented by numerous publications by IEEE, VDI, and SAE. He is the editor and editor in chief of different international journals. His research interests are primarily in the area of autonomous driving and intelligent transportation systems. He is a member of the Executive Committee of the IEEE Germany and the chair of IEEE ITSS German Chapter.



Robert Gee
Senior Manager Portfolio Development, Telematics & V2X
Architecture and Networking Business Area
Continental Automotive Systems, Inc.

Spanning more than 30 years, Robert's experience includes IBM, Loral, Motorola, and other leading companies in military and commercial communications systems, space and terrestrial technologies, and secure government communications for dozens of countries. A television Emmy Award recipient for his work as a producer for CNN, Robert successfully pioneered the modern contracting approach for citizen photojournalists with a CNN-estimated syndication audience at one time of over 1 billion viewers. At Continental, Robert has over 20 issued patents and leads connectivity strategy and innovation.



Tim Leinmüller
Head of Department
Corporate R&D / DENSO AUTOMOTIVE Deutschland GmbH

He is heading DENSO's European fundamental technology R&D department. His group is responsible for R&D in the domains of cybersecurity, microcontrollers, in-vehicle networks, and wireless communication. Tim is responsible for DENSO's involvement in the 5G Automotive Association (5GAA), where he is an elected member of the board since 2018, and elected chair of WG1 since 2019. Furthermore, he is representing DENSO in connectivity and CCAM (cooperative, connected and automated mobility) related activities in ETSI, CLEPA, ERTRAC, VDA, the CCAM Partnership, and the 6G Smart Networks and Services Industry Association (6G-IA). In total, Tim is working in the connected vehicles domain for more than 15 years. He is/has been serving in related organizations in multiple positions, amongst others as member of the technical committee and as chair of the architecture working group in the CAR 2 CAR Communication Consortium (C2C-CC). He received his joint-degree in Electrical Engineering from ENST-Paris and University of Stuttgart in 2003. From 2003 to 2007 he was with DaimlerChrysler AG Group Research and Advanced Engineering. During that time, he was involved in multiple European research projects such as OverDRIVE, Ambient Networks, and Sevecom. He also contributed to the IETF NEMO (Network Mobility) WG. In 2007 Tim joined DENSO AUTOMOTIVE Deutschland GmbH. He was responsible for EU V2X communication R&D and engineering activities, (co-)authored multiple publications, managed DENSO's participation in multiple R&D projects, and served as advisory board member in several public funded projects. He established DENSO's participations in V2X communication related organizations such as ETSI and 5GAA.



Jonathan Petit
Director Of Engineering
Qualcomm

Dr. Jonathan Petit is Director, Engineering at Qualcomm, where he leads the research in AI and Connected Automated Vehicles Security. Jonathan is one of the pioneers in cybersecurity of automated vehicles, demonstrating system vulnerabilities and developing security solutions. He was the first to demonstrate attacks on camera and LIDAR. His recent research on V2X misbehavior protection has been integrated in products and standards. Nowadays, Jonathan's research focuses on Automated Driving and Artificial Intelligence security. Jonathan also participates in standardization efforts in ISO, SAE, CEN/CENELEC and ETSI. Jonathan holds a PhD in Computer Science from the Paul Sabatier University Toulouse 3, France.

FITENTH IV 2023 CHAMPIONSHIP



THE IEEE INTELLIGENT VEHICLES SYMPOSIUM (IV 2023)



JUNE 4-7, 2023

Anchorage, Alaska USA



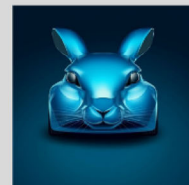
Monday June 06 from 1 to 5 pm - Qualification Round
Tuesday June 07 from 3 to 5 pm - Final Race



NC STATE UNIVERSITY



UC San Diego



[HTTPS://IV2023-RACE.FITENTH.ORG](https://iv2023-race.fitenth.org)



Register at Link
bit.ly/alaskaiv

OR

Scan QR
Code



DON'T MISS OUT!

SPACE IS LIMITED

REGISTER NOW FOR AUTO GAMEDAY

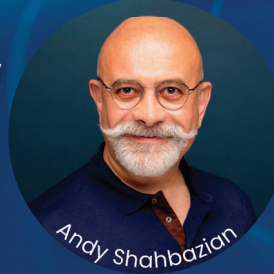


Date :
June 5th, 2023



Time :
1:00 PM – 3:00 PM

Hosted By
aws



Andy Shahbazian

REGISTER NOW

1. SPACE IS LIMITED

Register for the event (scan the QR code or use the link at the top)

2. SHOW UP ON JUNE 5th

Attend the first session on Monday, June 5th, from 1:00 – 3:00 pm.

During this session:

- You will build an AWS cloud-based DMS base reference solution using a lab provided by AWS.
- Teams will be given 24 hours to innovate and improve on the solutions.

3. COME BACK ON JUNE 6th

Teams are to come back Tuesday, June 6th, from 3:00-4:00 pm to demo their innovative solution. Presented solutions will be graded. Based on the leaderboard, the winning team will be awarded AWS credits as well as special IV2023 certificates and awards.

The automotive industry is evolving with Software-Defined Vehicles and cloud connectivity, addressing needs like fleet management. As of 2024, EU vehicles must have Driver Monitoring Systems (DMS) to combat driver distraction. Join our collaborative game to devise AWS solutions for DMS challenges in a creative, risk-free environment. Unlike traditional learning, teams are provided live AWS accounts to forge their unique solutions, perfect for those who enjoy open-ended challenges.

*The winner will be announced at the Banquet dinner & Award ceremony. We look forward to your participation in this unique and fun learning experience about AWS services and insights on using them for connected cars

Read More

bit.ly/alaskaivinfo





IEEE
IV 2023
IEEE INTELLIGENT VEHICLES SYMPOSIUM
Anchorage, Alaska, USA // June 4 - 7, 2023

MORNING YOGA

Welcome the day with a morning yoga practice.

7:00 to 7:30 AM

Monday, Tuesday, and Wednesday (June 5-7)



Dress comfortably for this 30 minute yoga session. We will start seated on a chair and rise to our feet for standing practice and finally ending with a seated meditation.

Program at a Glance

IEEE Intelligent Vehicles Symposium (IV 2023) - Program at a Glance									
From	To	samedi, juin 03	dimanche, juin 04	lundi, juin 05	mardi, juin 06	mercredi, juin 07			
08:00	08:30			Opening					
08:30	09:50			Oral Session 1	Oral Session 4	Oral Session 7			
09:50	11:20	Workshops & Tutorials Morning Sessions	Workshops & Tutorials Morning Sessions	Interactive Posters Sessions 1-4	Interactive Posters Sessions 9-11	Interactive Posters Sessions 16-18			
11:20	12:40			Oral Session 2	Oral Session 5	Oral Session 8			
12:40	13:40		Lunch Break	Lunch Break	Lunch Break	Lunch Break			
13:40	14:40		Workshops & Tutorials Afternoon Sessions	Plenary Session 1	Plenary Session 2				
14:40	16:00		FITenth Competition Trials (13:00 - 19:00)	FITenth Competition Qualifications (13:00 - 17:00)	Automotive Game Day Challenge (13:00 - 15:00)	Automotive Game Day Challenge Teams Demo (15:00 - 17:00)			
16:00	17:50	IEEE ITSS WIE and YP Networking Event (Starting 15:00)		Oral Session 3	Oral Session 6	Oral Session 9			
				Interactive Posters Sessions 5-8	Interactive Posters Sessions 12-15	Interactive Posters Sessions 19-22			
19:30	Late		Welcome Reception		Banquet Dinner				

Workshop Papers

WS02 - Workshop on Bridging the Gap between Map-based and Map-less Driving

Map-Aided Annotation for Pole Base Detection

Benjamin Missaoui (Université de Technologie de Compiègne, France); Maxime Noizet (Université de Technologie de Compiègne, Heudiasyc, France); Philippe Xu (University of Technology of Compiègne, Heudiasyc, France)

WS03 - Workshop on Safety Testing and Validation of Connected and Automated Vehicles

A Comprehensive Review on Ontologies for Scenario-Based Testing in the Context of Autonomous Driving

Maximilian Zipfl (FZI Research Center for Information Technology, Germany); Nina Koch (KIT Karlsruhe Institute of Technology, Germany); J. Marius Zöllner (FZI Research Center for Information Technology, Germany)

(Re)2H2O: Autonomous Driving Scenario Generation via Reversely Regularized Hybrid Offline-And-Online Reinforcement Learning

Haoyi Niu, Kun Ren, Yizhou Xu, Ziyuan Yang, Yichen Lin, Yi Zhang and Jianming Hu (Tsinghua University, China)

Vulnerability Analysis of Highly Automated Vehicular Systems Using Structural Redundancy

Vishnu Renganathan (The Ohio State University & Center for Automotive Research, USA); Qadeer Ahmed (The Ohio State University, USA)

WS04 - Workshop on Ensuring and Validating Safety for Automated Vehicles (EVSAV)

On Quantification for SOTIF Validation of Automated Driving Systems

Lina Putze (German Aerospace Center (DLR), Germany); Lukas Westhofen, Tjark Koopmann, Eckard Böde and Christian Neurohr (German Aerospace Center, Germany)

WS07 - Workshop on Social and Interactive and Safe Behaviors for Intelligent Vehicles: Benchmark, Models, and Applications

Filling Action Selection Reinforcement Learning Algorithm for Safer Autonomous Driving in Multi-Traffic Scenes

Fan Yang and Xueyuan Li (Beijing Institute of Technology, China); Qi Liu (Beijing Institute of Technology & Beijing Institute of Technology, China); Zirui Li (TU Dresden & Beijing Institute of Technology, Germany); Xin Gao (Beijing Institute of Technology, China)

A Review of Vision-Based Road Detection Technology for Unmanned Vehicles

Chaoyang Liu and Xueyuan Li (Beijing Institute of Technology, China); Qi Liu (Beijing Institute of Technology & Beijing Institute of Technology, China); Zirui Li (TU Dresden & Beijing Institute of Technology, Germany); Mengkai Li (Beijing Institute of Technology, China)

Towards Active Motion Planning in Interactive Driving Scenario: A Generic Utility Term of Interaction Activeness

Xiaocong Zhao (Key Laboratory of Road and Traffic Engineering, Ministry of Education Tongji University Shanghai, China); Meng Wang (Chair of Traffic Process Automation Technische Universität Dresden Dresden, Germany); Shiyu Fang and Jian Sun (Key Laboratory of Road and Traffic Engineering, Ministry of Education Tongji University Shanghai, China)

WS08 - Workshop on Human Factors in Intelligent Vehicles

Effect of Music Intervention Strategies on Mitigating Drivers' Negative Emotion in Post-Congestion Driving

Guofa Li (Chongqing University, China); Delin Ouyang (Shenzhen University, China); Qingkun Li (Tsinghua University, China); Xiaoxuan Sui and Xingda Qu (Shenzhen University, China); Gang Guo (Chongqing University, China)

Evaluating the Acceptance of Autonomous Vehicles in the Future

Angel Madridano (Universidad Carlos III de Madrid, Spain); Delgermaa Gankhuyag (Johannes Kepler University, Austria); Miguel Angel de Miguel and Martin Palos Lorite (Universidad Carlos III de Madrid, Spain); Cristina Olaverri-Monreal (Johannes Kepler University, Austria); Abdulla Al-Kaff (Universidad Carlos III de Madrid, Spain)

The Impact of System Transparency on Passenger's Quality of Experience in Highly Automated Driving

Chenchang Li and Zheng Wang (University of Tokyo, Japan); Bo Yang (The University of Tokyo, Japan); Muhua Guan and Chao Huang (University of Tokyo, Japan); Kimihiko Nakano (The University of Tokyo, Japan)

Human-Machine Interface Evaluation Using EEG in Driving Simulator

Yuan-Cheng Liu (Technical University of Munich, Germany); Nikol Figalová and Martin Baumann (UlM University, Germany); Klaus Bengler (Technical University of Munich, Germany)

Development and Validation of an Open Architecture for Autonomous Vehicle Control

Alfredo Valle Barrio (Universidad Politécnica de Madrid, Spain); Walter Morales Alvarez (JKU, Austria); Cristina Olaverri-Monreal (Johannes Kepler University, Austria); Jose Eugenio Naranjo (INSIA-Technical University of Madrid, Spain)

Workshop Papers

WS09 - Workshop on Internet of Things in Intelligent Transportation Systems

Hierarchical Federated Learning With Mean Field Game Device Selection for Connected Vehicle Applications

Hao Gao (University of Houston, USA); Yongkang Liu (Toyota Motor North America, USA); Emrah Akin Sisbot (InfoTech Labs, Toyota Motor North America, USA); Yashar Farid (Toyota Motor North America R&D, USA); Kentaro Oguchi (Toyota Motor North America R&D, InfoTech Labs, USA); Zhu Han (University of Houston, USA)

Driver Monitoring-Based Lane-Change Prediction: A Personalized Federated Learning Framework

Runjia Du (Purdue University, USA); Kyungtae Han (InfoTech Labs, Toyota Motor North America R&D, USA); Rohit Gupta (Info Tech Labs, Toyota Motor North America R&D); Sikai Chen (Purdue University & Carnegie Mellon University, USA); Samuel Labi and Ziran Wang (Purdue University, USA)

WS10 - Workshop on Scenario Generation for Testing Autonomous Vehicles

Research on Test Scenario Generation Based on BEV Perception

Liangyu Tian and Wangling Wei (Wuhan University of Science and Technology, China); Sifa Zheng (Tsinghua University, China); Chuan Sun (Tsinghua University Suzhou Automotive Research Institute, China); Haoran Li (Wuhan University of Science and Technology & Tsinghua University Suzhou Automotive Research Institute, China)

WS11 - Workshop on Naturalistic Driving Data Analytics (NDDA)

GAN-Based Deidentification of Drivers' Face Videos: An Assessment of Human Factors Implications in NDS Data

Surendrabikram Thapa (Virginia Tech, USA); Abhijit Sarkar (Virginia Tech Transportation Institute, USA)

WS12 - Workshop on Autonomy@Scale

LMR: Lane Distance-Based Metric for Trajectory Prediction

Julian Schmidt (Mercedes-Benz AG & Ulm University, Germany); Thomas Monninger (Mercedes-Benz Research and Development North America, USA); Julian Jordan (Mercedes-Benz AG, Germany); Klaus Dietmayer (Ulm University, Germany)

Augmentation-Based Domain Generalization for Semantic Segmentation

Manuel Schwonberg (University of Wuppertal & CARIAD SE, Germany); Hanno Gottschalk (University of Wuppertal, Germany); Nico Schmidt (CARIAD SE, Germany); Fadoua El Bouazati (University of Wuppertal, Germany)

Centralised Vehicle Routing for Optimising Urban Traffic: A Scalability Perspective

Lukas Chrpa (Czech Technical University in Prague, Czech Republic); Mauro Vallati (University of Huddersfield, United Kingdom (Great Britain))

WS13 - Workshop on In-cabin Human Sensing in Intelligent Vehicles

Transfer Learning for Driver Pose Estimation From Synthetic Data

Daniel Sagmeister and Dominik Schörkhuber (TU Wien, Austria); Matej Nezveda, Fabian Stiedl and Maria Schimkowitz (Emotion3d, Austria); Margrit Gelautz (Vienna University of Technology, Austria)

ViT-DD: Multi-Task Vision Transformer for Semi-Supervised Driver Distraction Detection

Yunsheng Ma and Ziran Wang (Purdue University, USA)

Viewpoint Invariant 3D Driver Body Pose-Based Activity Recognition

Manuel Martin, David Lerch and Michael Voit (Fraunhofer IOSB, Germany)

WS15 - Workshop and Industry Panel on Cooperative and Automated Driving

3D Multi-Object Tracking Based on Two-Stage Data Association for Collaborative Perception Scenarios

Shin'ichi Arakawa, Hao Su and Masayuki Murata (Osaka University, Japan)

WS16 - Workshop on 3D-Deep Learning for Autonomous Driving (3D-DLAD)

DeepSTEP - Deep Learning-Based Spatio-Temporal End-To-End Perception for Autonomous Vehicles

Sebastian Huch, Florian Sauerbeck and Johannes Betz (Technical University of Munich, Germany)

Vision-RADAR Fusion for Robotics BEV Detections: A Survey

Apoorv Singh (& Motional, USA)

WS18 - Workshop on Autoware – ROS-based OSS for Autonomous Driving

How Fast is My Software? Latency Evaluation for a ROS 2 Autonomous Driving Software

Tobias Betz and Maximilian Schmeller (Technical University of Munich, Germany); Harun Teper (Technical University of Dortmund, Germany); Johannes Betz (Technical University of Munich, Germany)

Efficient 3D Object Detection Models and Evaluation Method for Autonomous Driving

Jinhee Lee (DGIST, Korea (South)); Jae-Keun Lee (FutureDrive, Korea (South)); Joohyun Lee and Jeseok Kim (DGIST, Korea (South)); Soon Kwon (DGIST & FutureDrive Inc., Korea (South))

Workshop Papers

WS19 - Workshop on Interaction-driven Behavior Prediction and Planning for Autonomous Vehicles

Traffic Light and Uncertainty Aware Pedestrian Crossing Intention Prediction for Automated Vehicles

Minali Upreti (MBRDI, India); Jayanth Ramesh (Mercedes Benz Development and Research India, India); Chandan Kumar (Mercedes-Benz Research & Development India, India); Bodhisattwa Chakraborty (Mercedes Benz Research and Development India Pvt. Ltd., India); Vikram Balisavira (Mercedes Benz R&D, India); Markus Roth (TU Delft & Mercedes-Benz, Germany); Vitali Kaiser (Mercedes-Benz AG, Germany); Phillip Czech (Mercedes-Benz AG, University of Stuttgart, Germany)

WS20 - Workshop on Data Driven Intelligent Vehicle Applications (DDIVA)

Pedestrian Advisories for Enhanced Safety Using Behavior Maps: Computational Framework and Experimental Analysis With Real-World Data

Ross Greer (University of California, San Diego, USA); Samveed Desai, Lulua Rakla, Akshay Gopalkrishnan and Afnan Alofi (University of California San Diego, USA); Mohan M Trivedi (University of California, USA)

WS21 - Workshop on Remote Operation of Intelligent Connected and Automated Road Vehicles

A Survey of Teleoperation: Driving Feedback

Lin Zhao, Mikael Nybacka and Malte Rothhämel (KTH Royal Institute of Technology, Sweden)

Technical Program - Monday, June 5

8:30 - 9:50

J1: Journal Presentation 1 (Oral)

Room: Kahtnu 1 (2nd floor)

Chair: Jim Misener (Qualcomm, USA)

A Tutorial on the LTE-V2X Direct Communication

Abolfazl Hajisami, James Lansford, Aasif Dingankar, and Jim Misener,(Qualcomm, USA)

Connectivity-Based Delay-Tolerant Control of Automated Vehicles: Theory and Experiments

Gábor Orosz (University of Michigan, USA); Sergei Avedisov (Toyota Motor North America R&D, InfoTech Labs, USA); Sandor Beregi (University of Bristol, United Kingdom (Great Britain)); Chaozhe He (Plus AI, USA); Denes Takacs (Budapest University of Technology, Hungary)

Multi-Vehicle Conflict Management With Status and Intent Sharing Under Time Delays

Hao M. Wang (University of Michigan, USA); Sergei Avedisov and Onur Altintas (Toyota Motor North America R&D, InfoTech Labs, USA); Gábor Orosz (University of Michigan, USA)

Coordinated Cooperative Distributed Decision-Making Using Synchronization of Local Plans

Maximilian Kloock and Bassam Alrfaee (RWTH Aachen University, Germany)

8:30 – 9:50

O1: Automated Vehicles 1 (Oral)

Room: Tikahntu CDEF (3rd floor ballroom)

Chair: Abdulla Al-Kaff (Universidad Carlos III de Madrid, Spain)

Towards Realistic, Safety-Critical and Complete Test Case Catalogs for Safe Automated Driving in Urban Scenarios

Silvia Thal, Philip Wallis and Roman Henze (Technische Universität Braunschweig, Germany); Ryo Hasegawa, Hiroki Nakamura, Sou Kitajima and Genya Abe (Japan Automobile Research Institute, Japan)

Reinforcement Learning and Distributed Model Predictive Control for Conflict Resolution in Highly Constrained Spaces

Xu Shen (University of California, Berkeley, USA); Francesco Borrelli (UC Berkeley, USA)

WiFi-Based Localization for Fail-Aware Autonomous Driving in Urban Scenarios

Carlos Guindel (Universidad Carlos III de Madrid, Spain); Adrián García Sánchez and Noelia Hernández (Universidad de Alcalá, Spain); Ignacio Parra (University of Alcalá, Spain); Euntai Kim (Yonsei University, Korea (South))

A Benchmark Comparison of Imitation Learning-Based Control Policies for Autonomous Racing

Xiatao Sun, Mingyan Zhou, Zhijun Zhuang and Shuo Yang (University of Pennsylvania, USA); Johannes Betz (Technical University of Munich, Germany); Rahul Mangharam (University of Pennsylvania, USA)

9:50 - 11:20

P01: Connected & Cooperative Vehicles 1 (Interactive Poster)

Room: Kahtnu 2 (2nd floor)

Chair: Danyang Tian (Honda Research Institute USA, Inc., USA)

Cooperative Driving for Speed Harmonization in Mixed-Traffic Environments

Zhe Fu, Aboudy Kreidieh, Han Wang and Jonathan Lee (UC Berkeley, USA); Maria Laura Delle Monache (University of California, Berkeley, USA); Alexandre Bayen (UC Berkeley, USA)

Simulation-Based Performance Optimization of V2X Collective Perception by Adaptive Object Filtering

Quentin Delooz (Technische Hochschule Ingolstadt, Germany & Halmstad University, Sweden); Andreas Festag (Technische Hochschule Ingolstadt & Fraunhofer Institute for Transportation and Infrastructure Systems IVI, Germany); Alexey Vinel (Halmstad University, Sweden); Silas C. Lobo (Technische Hochschule Ingolstadt, Germany)

A Cooperative Perception System Robust to Localization Errors

Zhiying Song, Fuxi Wen, Hailiang Zhang and Jun Li (Tsinghua University, China)

Cooperative Automated Driving for Bottleneck Scenarios in Mixed Traffic

Marvin Baumann (KIT-IfV, Germany); Jürgen Beyerer (Fraunhofer IOSB, Germany); Sebastian Buck (Platomo GmbH, Germany); Barbara Deml (Karlsruher Institut für Technologie, USA); Sofie Ehrhardt (KIT-IFAB, Germany); Christian Frese and Dominik Kleiser (Fraunhofer IOSB, Germany); Martin Lauer (Karlsruhe Institute of Technology (KIT), Germany); Masoud Roschani (Fraunhofer IOSB, Germany); Miriam Ruf (Fraunhofer ICT, Germany); Christoph Stiller (Karlsruhe Institute of Technology, Germany); Peter Vortisch (KIT-IfV, Germany); Jens Ziehn (Fraunhofer IOSB & KAMO - Karlsruhe Mobility High Performance Center, Germany)

Automated Static Camera Calibration With Intelligent Vehicles

Alexander Tsaregorodtsev and Adrian Holzbock (Ulm University, Germany); Jan Stroheck (University of Ulm, Germany); Michael Buchholz (Ulm University, Germany); Vasileios Belagiannis (Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany)

CoLD Fusion: A Real-Time Capable Spline-Based Fusion Algorithm for Collective Lane Detection

Jörg Gamedinger, Sven Teufel and Georg Volk (University of Tübingen, Germany); Oliver Bringmann (University of Tuebingen, Embedded Systems / FZI, Germany)

Technical Program - Monday, June 5

Cooperative Merging Speed Planning: A Vehicle-Dynamics-Free Method

Zejiang Wang (Oak Ridge National Laboratory, USA); Adian Cook, Yunli Shao, Guan hao Xu and Jianfei Chen (Oak Ridge National Laboratory, USA)

Consensus-Based Fault-Tolerant Platooning for Connected and Autonomous Vehicles

Tzu-Yen Tseng, Ding-Jiun Huang, Jia-You Lin, Po-Jui Chang and Chung-Wei Lin (National Taiwan University, Taiwan); Changliu Liu (Carnegie Mellon University, USA)

LiDAR-Based Cooperative Relative Localization

Jiqian Dong (Purdue University, USA); Qi Chen (Toyota Motor North America, USA); Deyuan Qu (University of North Texas, USA); Hongsheng Lu (Toyota Motor North America InfoTech Labs, USA); Akila Ganlath (InfoTech Labs, Toyota Motor North America R&D, USA); Qing Yang (University of North Texas, USA); Sikai Chen (Purdue University & Carnegie Mellon University, USA); Samuel Labi (Purdue University, USA)

9:50 - 11:20

P02: Vehicle Environment Perception 1 (Interactive Poster)

Room: Tubughnenq' 3 (2nd floor)

Chair: Yuxiang Sun (The Hong Kong Polytechnic University, Hong Kong)

A Comprehensive Framework for Evaluating Vision-Based On-Board Rail Track Detection

Markus Ziegler and Vishal Mhasawade (DB Netz AG); Martin Köppel (DB Netz AG, Germany); Philipp Neumaier and Volker Eiselein (DB Netz AG)

Refined Objectification for Improving End-To-End Driving Model Explanation Persuasibility

Chenkai Zhang, Daisuke Deguchi and Hiroshi Murase (Nagoya University, Japan)

Improving Vehicle Trajectory Prediction With Online Learning

Ce Hao, Yuying Chen and Siyuan Cheng (Huawei Noah's Ark Lab, China); Hongbo Zhang (Huawei Technologies Co., Ltd, China)

Effects of Architectures on Continual Semantic Segmentation

Tobias Kalb (Porsche Engineering Services GmbH, Germany); Niket Ahuja (Algolux GmbH & Porsche Engineering GmbH, Germany); Jingxing Zhou (Porsche Engineering Group GmbH, Germany & Karlsruhe Institute of Technology, Germany); Jürgen Beyerer (Fraunhofer IOSB, Germany)

The Impact of Frame-Dropping on Performance and Energy Consumption for Multi-Object Tracking

Matti Henning, Michael Buchholz and Klaus Dietmayer (Ulm University, Germany)

Automated Sensor Performance Evaluation of Robot-Guided Vehicles for High Dynamic Tests

David Hermann (Technical University Munich & Porsche Engineering Services GmbH, Germany); Granit Tejeci (University of Stuttgart, Germany); Clara Marina Martínez (Porsche Engineering Services GmbH, Germany); Gereon Hinz (Technical University Munich, Germany); Alois Knoll (Technical University of Munich, Germany)

RT-K-Net: Revisiting K-Net for Real-Time Panoptic Segmentation

Markus Schön, Michael Buchholz and Klaus Dietmayer (Ulm University, Germany)

Predicting Driver Behavior on the Highway With Multi-Agent Adversarial Inverse Reinforcement Learning

Henrik Radtke (AUDI AG, Germany); Henrik Bey and Moritz Sackmann (CARIAD SE, Germany); Torsten Schön (Almotion Bavaria, Germany)

Using the Transferable Belief Model for Object Classification in LIDAR Data With Geometry, Motion and Context Features

Juan D. González (Bundeswehr University Munich & Institute for Autonomous Systems Technology, Germany); Michael Kusenbach (Bundeswehr University Munich, Germany); Hans-Joachim Wuensche (Universität der Bundeswehr München, Germany)

9:50 - 11:20

P03: Automated Vehicles 1 (Interactive Poster)

Room: Tubughnenq' 4 (2nd floor)

Chair: Morayo Adedjouma (CEA, France)

A Novel Framework for Modeling and Synthesizing Stealthy Cyberattacks on Driver-Assist Enabled Vehicles

Shian Wang (The University of Texas at El Paso, USA)

Vectorized Scenario Description and Motion Prediction for Scenario-Based Testing

Max Winkelmann (IAV GmbH & Technische Universität Berlin, Germany); Constantin Vasconi (IAV GmbH, Germany); Steffen Müller (Technical University Berlin, Germany)

Literature Review on Maneuver-Based Scenario Description for Automated Driving Simulations

Nicole Neis (Department for Simulation, Porsche Engineering Group GmbH, Weissach, Germany); Jürgen Beyerer (Fraunhofer IOSB, Karlsruhe, Germany); Vision and Fusion Lab, Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany)

Deep Learning Highway Traffic Scenario Construction With Trajectory Generators

Anne van der Heide (Siemens Digital Industries Software & KU Leuven, Belgium); Chris M.J. Tampère (KU Leuven, Belgium); Mike Nicolai (Siemens Digital Industries Software, Belgium)

MPC Builder for Autonomous Drive: Automatic Generation of MPCs for Motion Planning and Control

Kohei Honda, Hlroyuki Okuda, Tatsuya Suzuki and Akira Ito (Nagoya University, Japan)

Technical Program - Monday, June 5

Mono Video-Based AI Corridor for Model-Free Detection of Collision-Relevant Obstacles

Thomas Michalke, Yassin Kaddar and Thomas Nürnberg (Robert Bosch GmbH, Germany); Linh Kästner and Jens Lambrecht (Technische Universität Berlin, Germany)

Holistic Driving Scenario Concept for Urban Traffic

Hendrik Weber (RWTH Aachen University, Institute for Automotive Engineering & Fka GmbH, Germany); Christoph Glasmacher, Michael Schuldes, Nicolas Wagener and Lutz Eckstein (RWTH Aachen University, Institute for Automotive Engineering, Germany)

Path Planning for Autonomous Driving With Curvature-Considered Quadratic Optimization

Ziang Zhang, Ziyi Zou, Xiang Li, Mingyi Wang, Yixu Wang, Xiaoqing Guan, You Wang and Guang Li (Zhejiang University, China)

Large-Scale 3D Semantic Reconstruction for Automated Driving Vehicles With Adaptive Truncated Signed Distance Function

Haohao Hu (Karlsruhe Institute of Technology (KIT), Germany); Hexing Yang, Jian Wu and Xiao Lei (Karlsruhe Institute of Technology, Germany); Frank Bieder (FZI Forschungszentrum Informatik, Germany & KIT Karlsruhe Institute of Technology, Germany); Jan-Hendrik Pauls and Christoph Stiller (Karlsruhe Institute of Technology, Germany)

Interaction-Aware Merging in Mixed Traffic With Integrated Game-Theoretic Predictive Control and Inverse Differential Game

Mohamed-Khalil Bouzidi (Free University of Berlin & Continental AG, Germany); Ehsan Hashemi (University of Alberta, Canada)

Weakly Supervised Multi-Modal 3D Human Body Pose Estimation for Autonomous Driving

Peter Bauer (University of Stuttgart, Germany); Arij Bouazizi and Ulrich Kressel (Mercedes-benz AG, Germany); Fabian Flohr (Munich University of Applied Sciences, Germany)

9:50 - 11:20

P04: Vehicle Control (Interactive Poster)

Room: Tubughnenq' 5 (2nd floor)

Chair: Victor Fors (Stanford University, USA)

A Continuous Collision Detection Algorithm for Dubins Paths

Georg Schildbach (University of Luebeck, Germany)

Real-Time Spatial Trajectory Planning for Urban Environments Using Dynamic Optimization

Jona Ruof, Max Bastian Mertens, Michael Buchholz and Klaus Dietmayer (Ulm University, Germany)

Scenario-Based Decision-Making, Planning and Control for Interaction-Aware Autonomous Driving on Highways

Robin Kensbock, Maryam Nezami and Georg Schildbach (University of Luebeck, Germany)

Lateral Flow Control of Connected Vehicles Through Deep Reinforcement Learning

Yashar Farid (Toyota Motor North America R&D, USA); Aboudy Kreidieh (UC Berkeley, USA); Kentaro Oguchi (Toyota Motor North America R&D, InfoTech Labs, USA)

Residual Policy Learning for Vehicle Control of Autonomous Racing Cars

Raphael Trumpp, Denis Hoornaert and Marco Caccamo (Technical University of Munich, Germany)

Online Test Scheduling in Car Production Lines

Simone König (TU Munich & Mercedes-Benz AG, Germany); Birgit Vogel-Heuser (Technical University of Munich, Germany); Florian Karg (TU Munich, Germany); Kathrin Land (Technical University of Munich, Germany); Emanuele Carbone, Adam Hradecky, Michael Hahn and Oliver Kopp (Mercedes-Benz AG, Germany)

Towards Coordinated Motorways: A Slot-Based On-Ramp Merging Control Method

Yucheng Shi, Shaguna Gupta and Vinny Cahill (Trinity College Dublin, Ireland)

Robust LSTM-Based Vehicle Velocity Observer for Regular and Near-Limits Applications

Agapius Bou Ghosn (Mines Paris - PSL, France); Marcus Nolte (Technische Universität Braunschweig & Institute of Control Engineering, Germany); Philip Polack (Mines ParisTech, France); Arnaud de La Fortelle (MINES ParisTech, France); Markus Maurer (TU Braunschweig, Germany)

Long-Horizon Vehicle Planning and Control Through Real-Time Iterations

Victor Fors and J. Christian Gerdes (Stanford University, USA)

11:20 - 12:40

J2: Journal Presentation 2 (Oral)

Room: Kahtnu 1 (2nd floor)

Chair: Hans-Joachim Wuensche (Universität der Bundeswehr München, Germany)

A Real-Time Nonlinear Model Predictive Controller for Yaw Motion Optimization of Distributed Drive Electric Vehicles

Ningyuan Guo (Foshan University, China); Basilio Lenzo (University of Padova, Italy); Xudong Zhang, Yuan Zou and Ruiqing Zhai (Beijing Institute of Technology, China); Tao Zhang (Beijing Collaborative and Innovative Center for Electric Vehicles, China)

Exploiting Linear Structure for Precision Control of Highly Nonlinear Vehicle Dynamics

J. Christian Gerdes, Marsie Trego and Tushar Goel (Stanford University, USA)

Technical Program - Monday, June 5

Resilient Branching MPC for Multi-Vehicle Traffic Scenarios Using Adversarial Disturbance Sequences

Victor Fors (Stanford University, USA); Björn Olofsson (Lund University, Sweden); Erik Frisk (Linköping University, Sweden)

11:20 - 12:40

O2: Vehicle Environment Perception 1 (Oral)

Room: Tikahtnu CDEF (3rd floor ballroom)

Chair: Julie Stephany Berrio Perez (University of Sydney, Australia)

Toward Map Updates With Crosswalk Change Detection Using a Monocular Bus Camera

Tom Bu, John M. Dolan and Christoph Mertz (Carnegie Mellon University, USA)

Dense Traversability Estimation System for Extreme Environments

Yukiya Fukuda (Kyusyu Institute of Technology, Japan); Yuya Mii and Yuga Yano (Kyushu Institute of Technology, Japan); Hidenari Iwai and Shintaro Inoue (Toyota Motor Corporation, Japan); Hakaru Tamukoh (Kyushu Institute of Technology, Japan)

Adaptive-Mask Fusion Network for Segmentation of Drivable Road and Negative Obstacle With Untrustworthy Features

Zhen Feng (The Hong Kong Polytechnic University & Harbin Institute of Technology, Hong Kong); Yuchao Feng (The Hong Kong Polytechnic University, Hong Kong); Yanning Guo (Harbin Institute of Technology, China); Yuxiang Sun (The Hong Kong Polytechnic University, Hong Kong)

Real-Time Graph-Based Optimization for GNSS-Doppler Integrated RTK-GNSS/IMU/DR Positioning System in Urban Area

Aoki Takanose (University of Nagoya, Japan); Eijiro Takeuchi (TierIV Inc., Japan); Alexander Carballo (Gifu University & Nagoya University, Japan); Junichi Meguro (University of Meijo, Japan); Kazuya Takeda (Nagoya University, Japan)

14:40 - 15:40

J3: Journal Presentation 3 (Oral)

Room: Kahtnu 1 (2nd floor)

Chair: Javier Alonso-Mora (Delft University of Technology, The Netherlands)

Speed Profile Generation Strategy for Efficient Merging of Automated Vehicles on Roundabouts With Realistic Traffic

Juan F Medina (Centro de Automática y Robótica (CSIC - Universidad Politécnica de Madrid) & CSIC, Spain); Jorge Godoy (CSIC and UPM, Spain); Antonio Artuñedo and Jorge Villagra (CSIC, Spain)

Online and Predictive Warning With Risk Maps for Forced Lane Changes

Tim Puphal (Honda Research Institute Europe GmbH, Germany); Benedict Flade (Honda Research Institute Europe, Germany); Malte Probst (Honda Research Institute Europe GmbH, Germany); Volker Willert (Technische Hochschule Würzburg-Schweinfurt, Germany); Jürgen Adamy (Technische Universität Darmstadt, Germany); Julian Eggert (Honda Research Institute Europe, Germany)

Learning Interaction-Aware Guidance for Trajectory Optimization in Dense Traffic Scenarios

Bruno Brito (Motional AD LLC, USA); Achin Agarwal (TU Delft, The Netherlands); Javier Alonso-Mora (Delft University of Technology, The Netherlands)

14:40 - 16:00

O3: Connected & Cooperative Vehicles (Oral)

Room: Tikahtnu CDEF (3rd floor ballroom)

Chair: Zejiang Wang (Oak Ridge National Laboratory, USA)

Extrinsic Infrastructure Calibration Using the Hand-Eye Robot-World Formulation

Markus Horn, Thomas Wodtke, Michael Buchholz and Klaus Dietmayer (Ulm University, Germany)

Decision-Making Strategy Using Multi-Agent Reinforcement Learning for Platoon Formation in Agreement-Seeking Cooperation

Eunjeong Hyeon, Dominik Karbowski and Aymeric Rousseau (Argonne National Laboratory, USA)

Integration of Reinforcement Learning Based Behavior Planning With Sampling Based Motion Planning for Automated Driving

Marvin Klimke and Benjamin Völz (Robert Bosch GmbH, Germany); Michael Buchholz (Ulm University, Germany)

Multi-Layer Edge Computing for Cooperative Driving Control Optimization in Smart Cities

Yusuke Inagaki and Akihiro Nakao (The University of Tokyo, Japan)

16:00 - 17:30

P05: Driver State and Intent Recognition (Interactive Poster)

Room: Kahtnu 2 (2nd floor)

Chair: Zhaobo Zheng (Honda Research Institute USA, Inc, USA)

General and Multi-Criteria Approach to Study the Admissibility and Quality of a Driving Intention

Hugo Pousseur (Université de Technologie de Compiègne, France); Alessandro Victorino (Université de Technologie de Compiègne, France)

GAN-Based EEG Forecasting for Attaining Driving Operations

Mari Abe (Tokyo Laboratory, IBM Japan Ltd., Japan); Kenichi Takasaki (IBM Japan Ltd., Japan); Yuka Sasaki (IBM Japan, Ltd, Japan); Shoichiro Watanabe (IBM Japan Ltd., Japan); Yasutaka Nishimura (MODE Inc., Japan)

Technical Program - Monday, June 5

Interaction-Aware Maneuver Prediction for Autonomous Vehicles Using Interaction Graphs

Iago Pachêco Gomes, Sr. (University of São Paulo & Institute of Mathematics and Computer Science, Brazil); Cristiano Premebida (University of Coimbra & Institute of System and Robotics (ISR-UC), Portugal); Denis F. Wolf (University of Sao Paulo - USP & Institute of Mathematics and Computer Science, Brazil)

Evaluation of Differentially Constrained Motion Models for Graph-Based Trajectory Prediction

Theodor Westny and Joel Oskarsson (Linköping University, Sweden); Björn Olofsson (Lund University, Sweden); Erik Frisk (Linköping University, Sweden)

Explainable Driver Activity Recognition Using Video Transformer in Highly Automated Vehicle

Akash Sonth (Virginia Tech & Virginia Tech Transportation Institute, USA); Abhijit Sarkar (Virginia Tech Transportation Institute, USA); Hirva Bhagat (Virginia Polytechnic Institute and State University & Virginia Tech Transportation Institute, USA); Lynn Abbott (Virginia Tech, USA)

End-To-End Spatio-Temporal Attention-Based Lane-Change Intention Prediction From Multi-Perspective Cameras

Zhouqiao Zhao and Zhensong Wei (Center for Environmental Research and Technology, UC, Riverside, USA); Danyang Tian (Honda Research Institute USA, Inc., USA); Bryan Reimer and Prina Gershon (MIT, USA); Ehsan Moradi-Pari (Honda Research Institute US, USA)

Learn-able Evolution Convolutional Siamese Neural Network for Adaptive Driving Style Preference Prediction

Fatemeh Koochaki (Honda Research Institute USA, USA); Zhaobo Zheng (Honda Research Institute USA, Inc, USA); Kumar Akash and Teruhisa Misu (Honda Research Institute USA, Inc., USA)

RSG-Search: Semantic Traffic Scene Retrieval Using Graph-Based Scene Representation

Tian Yafu (Nagoya University, Japan); Alexander Carballo (Gifu University & Nagoya University, Japan); Ruifeng Li (Harbin Institute of Technology, Japan); Kazuya Takeda (Nagoya University, Japan)

16:00 - 17:30

P06: Vehicle Environment Perception 2 (Interactive Poster)

Room: Tubughnenq' 3 (2nd floor)

Chair: Vincent Fremont (Ecole Centrale de Nantes & LS2N CNRS, France)

Enhancing Robustness of LiDAR-Based Perception in Adverse Weather Using Point Cloud Augmentations

Sven Teufel, Jörg Gämderinger, Georg Volk and Christoph Gerum (University of Tübingen, Germany); Oliver Bringmann (University of Tuebingen, Embedded Systems / FZI, Germany)

Survey on LiDAR Perception in Adverse Weather Conditions

Mariella Dreissig (Mercedes-Benz AG & University of Freiburg, Germany); Florian Piewak and Dominik Scheuble (Mercedes-Benz AG, Germany); Joschka Boedecker (University of Freiburg, Germany)

Aligning Bird-Eye View Representation of Point Cloud Sequences Using Scene Flow

Minh Quan Dao (Ecole Centrale de Nantes & LS2N, France); Vincent Fremont (Ecole Centrale de Nantes & LS2N CNRS, France); Elwan Héry (École Centrale de Nantes & LS2N, France)

Domain Adaptation in LiDAR Semantic Segmentation via Hybrid Learning With Alternating Skip Connections

Eduardo R. Corral-Soto (Huawei Noahs Ark Lab Canada, Canada); Mrigank Rochan (University of Saskatchewan, Canada); Yannis Y. He, Xingxin Chen and Shubhra Aich (Huawei Noahs Ark Lab Canada, Canada); Bingbing Liu (Noah Ark Lab, Canada)

Investigating a Pressure Sensitive Surface Layer for Vehicle Localization

Simon Schäfer, Hendrik Steidl, Stefan Kowalewski and Bassam Alrifaae (RWTH Aachen University, Germany)

I Had a Bad Day: Challenges of Object Detection in Bad Visibility Conditions

Thomas Rothmeier and Diogo Wachtel (University of Applied Sciences Ingolstadt & CARISSMA, Germany); Tetmar von dem Bussche-Hünnefeld (University of Applied Sciences Ingolstadt, Germany); Werner Huber (Technische Hochschule Ingolstadt, Germany)

MPCNet: GNSS Multipath Error Compensation Network via Multi-Task Learning

Sangjae Cho (Korea Advanced Institute of Science and Technology, Korea (South)); Hong-Woo Seok (Korea Advanced Institute of Science & Technology, Korea (South)); Seung-Hyun Kong (Korea Advanced Institute of Science and Technology, Korea (South))

Evidential Deep-Learning-Based Multi-Modal Environment Perception for Intelligent Vehicles

Mihreteab Negash Geletu, Danut-Vasile Giurgi and Thomas Josso-Laurain (Université de Haute Alsace, France); Maxime Devanne (Université Haute-Alsace, France); Mengesha Mamo Wogari (Addis Ababa University, Ethiopia); Jean-Philippe Lauffenburger (Université de Haute-Alsace - IRIMAS & ENSISA, France)

Adversarial Attacks on Deep Learning Visual Object Detectors: Optimization and Evaluation of Physical Attack Vectors Using YOLOv4

Fritz Haas (Technical University of Berlin, Germany); Martin Stellmacher, Michael Paetzold, Ahmed Hussein and Elmar Matthes (IAV GmbH, Germany)

16:00 - 17:30

P07: Autonomous / Intelligent Robotic Vehicles 1 (Interactive Poster)

Room: Tubughnenq' 4 (2nd floor)

Chair: Frank Bieder (FZI Forschungszentrum Informatik, Germany & KIT Karlsruhe Institute of Technology, Germany)

Model Predictive Control for Autonomous Vehicle Following

Alexander Bienemann and Hans-Joachim Wuensche (Universität der Bundeswehr München, Germany)

Technical Program - Monday, June 5

Truss Feature Based Robust Localization Method for Vehicles in Dynamic Industrial Scene

Ying Wu, Wei Yuan and Bing Wang (Shanghai Jiao Tong University, China); Chaochun Lian, Yongchun Yao and Yan Cai (SAIC-GM-Wuling Automobile Company Limited, China); Ming Yang (Shanghai Jiao Tong University, China)

Resilient Navigation Based on Multimodal Measurements and Degradation Identification for High-Speed Autonomous Race Cars

Daegy Lee, Hyunwoo Nam, Chanhoe Ryu, Sungwon Nah and David Hyunchul Shim (KAIST, Korea (South))

M-LIO: Multi-Lidar, Multi-IMU Odometry With Sensor Dropout Tolerance

Sandipan Das (KTH Royal Institute of Technology & Scania, Sweden); Navid Mahabadi (Scania, Sweden); Maurice Fallon (Oxford Robotics Institute, United Kingdom (Great Britain)); Saikat Chatterjee (KTH - Royal Institute of Technology & Communication Theory Lab, Sweden)

A Simple and Model-Free Path Filtering Algorithm for Smoothing and Accuracy

Thomas Steinecker (University of the Bundeswehr Munich, Germany); Hans-Joachim Wuensche (Universität der Bundeswehr München, Germany)

Towards Continual Knowledge Learning of Vehicle CAN-Data

Sajeel Ahmed (Technical University of Darmstadt, Germany); Ousama Esbel (Compredict GmbH, Germany); Max Mühlhäuser (Technical University Darmstadt, Germany); Alejandro Sanchez Guinea (TU Darmstadt, Germany)

A Parallel Monte-Carlo Tree Search-Based Metaheuristic for Optimal Fleet Composition Considering Vehicle Routing Using Branch & Bound

Tren M.J.T. Baltussen and Mithun Goutham (The Ohio State University, USA); Meghna Menon, Sarah G. Garrow and Mario A. Santillo (Ford Motor Company, USA); Stephanie Stockar (The Ohio State University, USA)

Multi-Agent Decision-Making at Unsignalized Intersections With Reinforcement Learning From Demonstrations

Chang Huang, Junqiao Zhao, Hongtu Zhou, Hai Zhang, Xiao Zhang and Chen Ye (Tongji University, China)

Optimization and Interpretability of Graph Attention Networks for Small Sparse Graph Structures in Automotive Applications

Marion Neumeier (Technische Hochschule Ingolstadt, Germany); Andreas Tollkuehn and Sebastian Dorn (AUDI AG, Germany); Michael Botsch (THI, Germany); Wolfgang Utschick (Technische Universität München, Germany)

16:00 - 17:30

P08: Human Factors and Human Machine Interaction (Interactive Poster)

Room: Tubughnenq' 5 (2nd floor)

Chair: Amir Rasouli (Huawei Technologies Canada, Canada)

A Set of Design Principles for Personalized Information in Automated Driving User Interfaces Based on Theory and Empirical Evidence

Tim Driesen-Micklitz (University of Rostock & Mercedes-Benz AG, Germany); Michael Fellmann (University of Rostock, Germany); Carsten Röcker (OWL University of Applied Sciences and Arts, Germany)

Safe Decision or Collision? Using Natural Habituated Interfaces to Increase Traffic Safety

Jürgen Pichen, Nikol Figalová and Martin Baumann (Ulm University, Germany)

Design of an Experiment to Pinpoint Cognitive Failure Processes in the Interaction of Motorists and Vulnerable Road Users

Florian Denk (Technische Hochschule Ingolstadt & Technical University of Munich, Germany); Felix Fröhling, Pascal Brunner and Werner Huber (Technische Hochschule Ingolstadt, Germany); Martin Margreiter and Klaus Bogenberger (Technische Universität München, Germany); Ronald Kates (REK Consulting, Germany)

Cross-Cultural Behavior Analysis of Street-Crossing Pedestrians in Japan and Germany

Janis Sprenger (German Research Center for Artificial Intelligence (DFKI) & Saarland University, Germany); Lorena Hell (Trier University, Germany); Matthias Klusch (DFKI, Germany); Yoshiyuki Kobayashi and Shoma Kudo (National Institute of Advanced Industrial Science and Technology, Japan); Christian Müller (German Research Center for Artificial Intelligence, Germany)

Are Head-Mounted Displays Really Not Suitable for Driving Simulation? A Comparison With a Screen-Based Simulator

Chantal Himmels (BMW Group & Technische Hochschule Ingolstadt, Germany); Vladislav Andreev (BMW Group & Technical University of Munich, Germany); Arslan Ali Syed and Johannes Lindner (Technical University of Munich, Germany); Florian Denk (Technische Hochschule Ingolstadt & Technical University of Munich, Germany); Andreas Riener (Technische Hochschule Ingolstadt & CARISSMA Institute of Automated Driving (C-IAD), Germany)

Driver Gaze Fixation and Pattern Analysis in Safety Critical Events

Hirva Bhagat (Virginia Polytechnic Institute and State University & Virginia Tech Transportation Institute, USA); Sandesh Jain (Virginia Tech & Virginia Tech Transportation Institute, USA); Lynn Abbott (Virginia Tech, USA); Akash Sonth (Virginia Tech & Virginia Tech Transportation Institute, USA); Abhijit Sarkar (Virginia Tech Transportation Institute, USA)

Uncertainty Aware Task Allocation for Human-Automation Cooperative Recognition in Autonomous Driving Systems

Atsushi Kuribayashi and Eijiro Takeuchi (Nagoya University, Japan); Alexander Carballo (Gifu University & Nagoya University, Japan); Yoshio Ishiguro and Kazuya Takeda (Nagoya University, Japan)

Changing the Perspective: Assessing the Controllability of Minimal Risk Maneuvers for Surrounding Traffic Participants

Burak Karakaya and Klaus Bengler (Technical University of Munich, Germany)

Exploring Vehicular Interaction From Trajectories Based on Granger Causality

Xishun Liao (University of California Riverside, USA); Guoyuan Wu and Matthew J Barth (University of California, Riverside, USA); Rohit Gupta (Toyota Motor North America, USA); Kyungtae Han (InfoTech Labs, Toyota Motor North America R&D, USA)

Technical Program - Tuesday, June 6

8:30 - 9:50

J4: Journal Presentation 4 (Oral)

Room: Kahtnu 1 (2nd floor)

Chair: Teruhisa Misu (Honda Research Institute USA, Inc., USA)

Hybrid State Estimation-A Contribution Towards Reliability Enhancement of Artificial Neural Network Estimators

Philipp M. Sieberg (University of Duisburg-Essen & Schotte Automotive GmbH & Co. KG, Germany); Sebastian Blume (University of Duisburg-Essen, Germany); Niko Maas (ITQ GmbH, Germany); Dieter Schramm (University of Duisburg-Essen, Germany)

Hybrid Reinforcement Learning-Based Eco-Driving Strategy for Connected and Automated Vehicles at Signalized Intersections

Zhengwei Bai (University of California, Riverside, USA)

Unsupervised Scalable Multimodal Driving Anomaly Detection

Yuning Qiu (The University of Texas at Dallas, USA); Teruhisa Misu (Honda Research Institute USA, Inc., USA); Carlos A Busso (University of Texas at Dallas, USA)

8:30 - 9:50

O4: Autonomous / Intelligent Robotic Vehicles (Oral)

Room: Tikahtnu CDEF (3rd floor ballroom)

Chair: Rahul Mangharam (University of Pennsylvania, USA)

InfraDet3D: Multi-Modal 3D Object Detection Based on Roadside Infrastructure Camera and LiDAR Sensors

Walter Zimmer, Joseph Birkner, Marcel Brucker, Huu Tung Nguyen, Stefan Petrovski and Bohan Wang (Technical University of Munich, Germany); Alois Knoll (Technical University Munich Garching, Germany)

Simulation-Based Counterfactual Causal Discovery on Real World Driver Behaviour

Rhys PM Howard and Lars Kunze (University of Oxford, United Kingdom (Great Britain))

Sit Back and Relax: Learning to Drive Incrementally in All Weather Conditions

Stefan Leitner (Technical University of Graz, Austria); Muhammad Jehanzeb Mirza (Graz University of Technology, Austria); Wei Lin (Technical University of Graz, Austria); Jakub Micorek (Graz University of Technology, Austria); Marc Masana, Mateusz Kozinski, Horst Possegger and Horst Bischof (Technical University of Graz, Austria)

Adversarial Driving: Attacking End-To-End Autonomous Driving

Han Wu (University of Exeter, United Kingdom (Great Britain)); Syed Yunas (The University of the West of England, United Kingdom (Great Britain)); Sareh Rowlands and Johan Wahlstrom (University of Exeter, United Kingdom (Great Britain))

9:50 - 11:20

P09: Information Fusion (Interactive Poster)

Room: Kahtnu 2 (2nd floor)

Chair: Boulaid Boulkroune (Flanders Make, Belgium)

Targetless Extrinsic Calibration Between Event-Based and RGB Camera for Intelligent Transportation Systems

Christian Creß (Technical University of Munich, Germany); Erik Schütz (Munich University of Applied Sciences, Germany); Bare L Zagar (Technical University of Munich, Germany); Alois Knoll (Technical University Munich Garching, Germany)

Framework for Quality Evaluation of Smart Roadside Infrastructure Sensors for Automated Driving Applications

Laurent Kloeker, Chenghua Liu and Chao Wei (RWTH Aachen University, Germany); Lutz Eckstein (RWTH Aachen University, Institute for Automotive Engineering, Germany)

Fault Resistant Odometry Estimation Using Message Passing Neural Network

Pragyan Dahal, Simone Mentasti, Luca Paparusso, Stefano Arrigoni and Francesco Braghin (Politecnico di Milano, Italy)

D3VL-SLAM: 3D Visual Inertial LiDAR SLAM for Outdoor Environments

Matteo Frosi and Matteo Matteucci (Politecnico di Milano, Italy)

Auto-Tuning Extended Kalman Filters to Improve State Estimation

Boulaid Boulkroune, Kurt Geebelen, Jia Wan and Ellen van Nunen (Flanders Make, Belgium)

L2V2T2Calib: Automatic and Unified Extrinsic Calibration Toolbox for Different 3D LiDAR, Visual Camera and Thermal Camera

Jun Zhang, Yiyao Liu and Mingxing Wen (Nanyang Technological University, Singapore); Yufeng Yue (Beijing Institute of Technology, China); Haoyuan Zhang (Nanyang Technological University, Singapore); Danwei Wang (Nanyang Technological University)

Procedural Generation of Complex Roundabouts for Autonomous Vehicle Testing

Zarif Ikram (Bangladesh University of Engineering and Technology, Bangladesh); Golam Md Muktadir and Jim Whitehead (University of California, Santa Cruz, USA)

A Tightly-Coupled GNSS RTK/INS Positioning Algorithm Based on Adaptive Lag Smoother

Cheng Ye (Zhejiang Lab, China); Wei Li (The Institute of Computing Technology, the Chinese Academy of Sciences & Zhejiang Lab, China); Yu Hu (Institute of Computing Technology, Chinese Academy of Sciences, China)

Technical Program - Tuesday, June 6

9:50 - 11:20

P10: Connected & Cooperative Vehicles 2 (Interactive Poster)

Room: Tubughnenq' 3 (2nd floor)

Chair: Bassam Alrifaae (RWTH Aachen University, Germany)

Studying the Impact of Semi-Cooperative Drivers on Overall Highway Flow

Noam Buckman (Massachusetts Institute of Technology, USA); Sertac Karaman and Daniela Rus (MIT, USA)

Automatic Intersection Management in Mixed Traffic Using Reinforcement Learning and Graph Neural Networks

Marvin Klimke and Benjamin Völz (Robert Bosch GmbH, Germany); Michael Buchholz (Ulm University, Germany)

Can Listening to More Neighbours Help CAVs Be Faster and Safer?

Mohit Garg and Mélanie Bouroche (Trinity College Dublin, Ireland)

LUCOOP: Leibniz University Cooperative Perception and Urban Navigation Dataset

Jeldrik Axmann, Rozhin Moftizadeh, Jingyao Su, Benjamin Tennstedt, Qianqian Zou, Yunshuang Yuan and Dominik Ernst (Leibniz University Hannover, Germany); Hamza Alkhatib (Leibniz Universität Hannover, Germany); Claus Brenner (Leibniz University of Hannover, Germany); Steffen Schön (Leibniz Universität Hannover, Germany)

HPCR-VI: Heterogeneous Point Cloud Registration for Vehicle-Infrastructure Collaboration

Yuting Zhao and Xinyu4 Zhang (Tsinghua University, China); Shiyan Zhang (Tsinghua University); Shaoting Qiu, Haojie Yin and Xu Zhang (Tsinghua University, China)

Combined Registration and Fusion of Evidential Occupancy Grid Maps for Live Digital Twins of Traffic

Raphael van Kempen, Laurenz Heidrich, Bastian Lampe and Timo Wopen (RWTH Aachen University, Germany); Lutz Eckstein (RWTH Aachen University, Institute for Automotive Engineering, Germany)

Towards Synthetic Data Generation of VANET Attacks for Efficient Testing

Thomas Rosenstatter and Kateryna Melnyk (RISE Research Institutes of Sweden, Sweden)

Cooperative Reinforcement Learning-Based Damping of Lane-Change-Induced Waves

Yashar Farid (Toyota Motor North America R&D, USA); Kathy Jang (UC Berkeley, USA); Kentaro Oguchi (Toyota Motor North America R&D, InfoTech Labs, USA)

Energy-Efficient Lane Changes Planning and Control for Connected Autonomous Vehicles on Urban Roads

Eunhyek Joa (UC Berkeley, USA); Hotae Lee and Eric Yongkeun Choi (University of California, Berkeley, USA); Francesco Borrelli (UC Berkeley, USA)

Evidence Based Trust Scoring for Multimodal VANET Applications

Krispin Raich (University of Passau, Germany); Robert Kathrein and Mario Döller (University of Applied Sciences Kufstein, Austria)

9:50 - 11:20

P11: Automated Vehicles 2 (Interactive Poster)

Room: Tubughnenq' 4 (2nd floor)

Chair: Sascha Hornauer (MINES Paris - PSL, France)

VIF-GNN: A Novel Agent Trajectory Prediction Model Based on Virtual Interaction Force and GNN

Yuning Wang, Zhiyuan Liu, Haotian Lin, Jinhao Li, Ruo Chen Li and Jianqiang Wang (Tsinghua University, China)

Efficient Lane-Changing Behavior Planning via Reinforcement Learning With Imitation Learning Initialization

Jiamin Shi, Tangyike Zhang, Junxiang Zhan, Shitao Chen, Jingmin Xin and Nanning Zheng (Xi'an Jiaotong University, China)

Self-Aware Trajectory Prediction for Safe Autonomous Driving

Wenbo Shao, Jun Li and Hong Wang (Tsinghua University, China)

ODD-Centric Contextual Sensitivity Analysis Applied to A Non-Linear Vehicle Dynamics Model

Richard Schubert (Technische Universität Braunschweig, Germany); Marcus Nolte (Technische Universität Braunschweig & Institute of Control Engineering, Germany); Arnaud de La Fortelle (MINES ParisTech, France); Markus Maurer (TU Braunschweig, Germany)

Automatic Disengagement Scenario Reconstruction Based on Urban Test Drives of Automated Vehicles

Zhijing Zhu, Robin Philipp, Yongqi Zhao and Constanze Hungar (Volkswagen AG, Germany); Jürgen Pannek (TU Braunschweig, Germany); Falk Howar (TU Dortmund, Germany)

Operational Design Domain for Automated Driving Systems: Taxonomy Definition and Application

Leo Mendiboure and Mohamed Lamine Benzagouta (Université Gustave Eiffel, France); Dominique Gruyer (Univ Gustave Eiffel, France); Tidiane Sylla (Université Gustave Eiffel, France & Université Des Sciences, Des Techniques Et Des Technologies de Bamako, Mali); Morayo Adedjouma (CEA, France); Abdelmenname Hedhli (Université Gustave Eiffel, France)

Multi-Horizon and Multi-Rate Model Predictive Control for Integrated Longitudinal and Lateral Vehicle Control

Ching Lin Kuan, Kohei Honda, Hiroaki Okuda and Tatsuya Suzuki (Nagoya University, Japan)

Technical Program - Tuesday, June 6

Risk in Stochastic and Robust Model Predictive Path-Following Control for Vehicular Motion Planning

Leon Tolksdorf (Eindhoven University of Technology & Technische Hochschule Ingolstadt, Germany); Arturo Tejada and Nathan van de Wouw (Eindhoven University of Technology, The Netherlands); Christian Birkner (Technische Hochschule Ingolstadt, Germany)

Adaptive Look-Ahead Distance Based on an Intelligent Fuzzy Decision for an Autonomous Vehicle

Fadel Tarhini (University of Technology of Compiègne, France); Reine Talj (Heudiasyc, Compiègne, France); Moustapha Doumiati (ESEO-Angers, High School of Engineering, France)

Deep High-Level Policy Model Predictive Contour Control for Autonomous Racing

Wenjun Liu and Minghao Zeng (Technical University of Munich, Germany); Guang Chen (Tongji University, Germany); Alois Knoll (Technical University of Munich, Germany)

Visual-Saliency-Guided Channel Pruning for Deep Visual Detectors in Autonomous Driving

Jung Im Choi and Qing Tian (Bowling Green State University, USA)

11:20 - 12:40

J5: Journal Presentation 5 (Oral)

Room: Kahtnu 1 (2nd floor)

Chair: Denis Gingras (Université de Sherbrooke, Canada)

A Deep Learning Approach for LiDAR Resolution-Agnostic Object Detection

Ruddy Théodose (La Rochelle Université, France); Dieumet Denis (Sherpa Engineering, France); Thierry Chateau (Institut Pascal, France); Vincent Fremont (Ecole Centrale de Nantes & LS2N CNRS, France); Paul Checchin (LASMEA - Université Blaise Pascal, France)

Detection of Localization Failures Using Markov Random Fields With Fully Connected Latent Variables for Safe LiDAR-Based Automated Driving

Naoki Akai, Yasuhiro Akagi, Takatsugu Hirayama, Takayuki Morikawa and Hiroshi Murase (Nagoya University, Japan)

Immediate Vehicle Movement Estimation and 3D Reconstruction for Mono Cameras by Utilizing Epipolar Geometry and Direction Prior

Zoltan Rozsa (Institute for Computer Science and Control); Marcell Golarits (Institute for Computer Science and Control, Hungary); Tamas Szirányi (Computer and Automation Research Institute of the Hungarian Academy of Sciences & Budapest University of Technology and Economics, Hungary)

Survey on Fish-Eye Cameras and Their Applications in Intelligent Vehicles

Yeqiang Qian and Ming Yang (Shanghai Jiao Tong University, China); John M. Dolan (Carnegie Mellon University, USA)

11:20 - 12:40

O5: Human Factors and Human Machine Interaction (Oral)

Room: Tikahtnu CDEF (3rd floor ballroom)

Chair: Kazuya Takeda (Nagoya University, Japan)

Characterizing Drivers' Peripheral Vision via the Functional Field of View for Intelligent Driving Assistance

Abhijat Biswas and Henny Admoni (Carnegie Mellon University, USA)

Modeling Human Road Crossing Decisions as Reward Maximization With Visual Perception Limitations

Yueyang Wang and Aravinda Ramakrishnan Srinivasan (University of Leeds, United Kingdom (Great Britain)); Jussi P.P. Jokinen (University of Jyväskylä, United Kingdom (Great Britain)); Antti Oulasvirta (Aalto University, Finland); Gustav Markkula (University of Leeds, United Kingdom (Great Britain))

Intend-Wait-Perceive-Cross: Exploring the Effects of Perceptual Limitations on Pedestrian Decision-Making

Lullia Kotseruba (York University, Canada); Amir Rasouli (Huawei Technologies Canada, Canada)

Drive Right: Shaping Public's Trust, Understanding, and Preference Towards Autonomous Vehicles Using a Virtual Reality Driving Simulator

Zhijie Qiao (University of Pennsylvania & The Autoware Foundation, USA); Xiatao Sun (University of Pennsylvania, USA); Helen Loeb (Jitsik LLC, USA); Rahul Mangharam (University of Pennsylvania, USA)

14:40 - 15:40

J6: Journal Presentation 6 (Oral)

Room: Kahtnu 1 (2nd floor)

Chair: Ehsan Hashemi (University of Alberta, Canada & University of Waterloo, Canada)

Probabilistic Metamodels for an Efficient Characterization of Complex Driving Scenarios

Max Winkelmann (IAV GmbH & Technische Universität Berlin, Germany); Mike Kohlhoff (MHP Management- und IT-Beratung GmbH, Germany); Hamma Hadj Tadjine (IAV GmbH, Germany); Steffen Müller (Technical University Berlin, Germany)

Preliminary Study of Tactical-Level Interaction for Highly-Automated Vehicles: Its Application to Touchscreen Interface

Mitsuhiro Kamezaki (The University of Tokyo, Japan); Udara Manawadu (Toyota Group, Japan); Masaaki Ishikawa (Waseda University, Japan); Shigeki Sugano (Japan)

Technical Program - Tuesday, June 6

14:40 - 16:00

O6: IV related Image, Radar, Lidar Signal Processing (Oral)

Room: Tikahtnu CDEF (3rd floor ballroom)

Chair: Alexander Carballo (Gifu University & Nagoya University, Japan)

Augmenting Legacy Networks for Flexible Inference

Jason L Clemons, Iuri Frosio and Maying Shen (NVIDIA, USA); Jose Alvarez (Nvidia, Australia); Stephen W Keckler (NVIDIA, USA)

Towards Pragmatic Semantic Image Synthesis for Urban Scenes

George Eskandar and Diandian Guo (University of Stuttgart, Germany); Karim Guirguis (Robert Bosch GmbH, Germany); Bin Yang (University of Stuttgart, Germany)

Metric Learning Based Class Specific Experts for Open-Set Recognition of Traffic Participants in Urban Areas Using Infrastructure Sensors

Karthikeyan Chandra Sekaran (AININ gGmbH, Germany); Lakshman Balasubramanian (Technische Hochschule Ingolstadt, Germany); Michael Botsch (THI, Germany); Wolfgang Utschick (Technische Universität München, Germany)

Enhanced K-Radar: Optimal Density Reduction to Improve Detection Performance and Accessibility of 4D Radar Tensor-Based Object Detection

Donghee Paek, Seung-Hyun Kong and Kevin T. Wijaya (Korea Advanced Institute of Science and Technology, Korea (South))

16:00 - 17:30

P12: Active and Passive Vehicle Safety (Interactive Poster)

Room: Kahtnu 2 (2nd floor)

Chair: Bowen Weng (The Ohio State University & Transportation Research Center Inc., USA)

Distributed Voters for Automotive Applications

Martin Johannes Stoffel and Eric Sax (Karlsruhe Institute of Technology, Germany)

Comparing the Crash Risk of Vehicle-Pedestrian Interaction Using Autonomous Vehicle Data

Gabriel Lanzaro, Chuanyun Fu and Tarek Sayed (University of British Columbia, Canada)

Safe Autonomous Driving in Adverse Weather: Sensor Evaluation and Performance Monitoring

Fatih Sezgin, Daniel Vriesman, Dagmar Steinhauser, Robert Lugner and Thomas Brandmeier (Technische Hochschule Ingolstadt, Germany)

Method for Comparison of Surrogate Safety Measures in Multi-Vehicle Scenarios

Enrico Del Re (Johannes Kepler University Linz, Austria); Cristina Olaverri-Monreal (Johannes Kepler University, Austria)

Attack Simulation and Adaptation in CAN for Training and Evaluation of IDS

Jo Laufenberg, Susanne Throner and Thomas Kropf (University of Tuebingen, Germany); Oliver Bringmann (University of Tuebingen, Embedded Systems / FZI, Germany)

1001 Ways of Scenario Generation for Testing of Self-Driving Cars: A Survey

Barbara U Schütt, Joshua Ransiek and Thilo Braun (FZI Research Center for Information Technology, Germany); Eric Sax (Karlsruhe Institute of Technology, Germany)

CommonRoad-CriMe: A Toolbox for Criticality Measures of Autonomous Vehicles

Yuanfei Lin (Technical University of Munich, Germany); Matthias Althoff (Technische Universität München, Germany)

Inverse Universal Traffic Quality - a Criticality Metric for Crowded Urban Traffic Scenes

Barbara U Schütt, Maximilian Zipfl and J. Marius Zöllner (FZI Research Center for Information Technology, Germany); Eric Sax (Karlsruhe Institute of Technology, Germany)

16:00 - 17:30

P13: Vehicle Environment Perception 3 (Interactive Poster)

Room: Tubughnenq' 3 (2nd floor)

Chair: Alexandre Bernardino (Instituto Superior Técnico, University of Lisbon, Portugal & IST-ID, Portugal)

Quantifying Object Detection Uncertainty in Autonomous Driving With Test-Time Augmentation

Rui Magalhães (Instituto Superior Técnico, Portugal); Alexandre Bernardino (Instituto Superior Técnico, University of Lisbon, Portugal & IST-ID, Portugal)

Adversarial Detection: Attacking Object Detection in Real Time

Han Wu (University of Exeter, United Kingdom (Great Britain)); Syed Yunas (The University of the West of England, United Kingdom (Great Britain)); Sareh Rowlands and Johan Wahlstrom (University of Exeter, United Kingdom (Great Britain))

Automatic Extrinsic Calibration of Thermal Camera and LiDAR for Vehicle Sensor Setups

Farhad Dalirani and Farzan Heidari (Western University, Canada); Taufiq Rahman (National Research Council, Canada); Daniel Singh Cheema (National Research Council Canada, Canada); Michael A. Bauer (University of Western Ontario, Canada)

Technical Program - Tuesday, June 6

LIV-DeepSORT: Optimized DeepSORT for Multiple Object Tracking in Autonomous Vehicles Using Camera and LiDAR Data Fusion

Zo Andrianina Toavina Rakotonaiaina, MSc. (Université de Sherbrooke & Laboratory on Intelligent Vehicles, Canada); Nacer Eddine Chelbi and Denis Gingras (Université de Sherbrooke, Canada); Frederic Faulconnier (Nova Bus Inc., Canada)

ExistenceMap-PointPillars: A Multi-Fusion Network for Stable 3D Object Detection With Pseudo 2D Maps

Keigo Hariya, Hiroki Inoshita and Keisuke Yoneda (Kanazawa University, Japan); Ryo Yanase (Kanazawa University & Advanced Mobility Research Institute, Japan); Kota Ishii and Naoki Suganuma (Kanazawa University, Japan)

TADP: Task-Aware Deformable Prediction for Single-Stage 3D Object Detection

Su Wang, Yaochen Li and Min Yang (Xi'an Jiaotong University, China); Jiahao Nie (Nanyang Technological University, Singapore); Chang Liu (CSSC Systems Engineering Research Institute, China); Yuehu Liu (Xi'an Jiaotong University, China)

Perception Datasets for Anomaly Detection in Autonomous Driving: A Survey

Daniel Bogdoll (FZI Research Center for Information Technology, Germany); Svenja Uhlemeyer and Kamil Kowol (University of Wuppertal, Germany); J. Marius Zöllner (FZI Research Center for Information Technology, Germany)

Expert-Driven Rule-Based Refinement of Semantic Segmentation Maps for Autonomous Vehicles

Eric L. Manibardo (TECNALIA Research & Innovation Center & University of the Basque Country, Spain); Ibai Laña (TECNALIA Research and Innovation Center, Spain); Javier Del Ser (TECNALIA, Spain); Alexander Carballo (Gifu University & Nagoya University, Japan); Kazuya Takeda (Nagoya University, Japan)

Example-Based Query to Identify Causes of Driving Anomaly With Few Labeled Samples

Yuning Qiu (The University of Texas at Dallas, USA); Teruhisa Misu (Honda Research Institute USA, Inc., USA); Carlos A Busso (University of Texas at Dallas, USA)

16:00 - 17:30

P14: Autonomous / Intelligent Robotic Vehicles 2 (Interactive Poster)

Room: Tubughnenq' 4 (2nd floor)

Chair: Rui Oliveira (KTH Royal Institute of Technology, Sweden)

Safety-Critical Decision-Making and Control for Autonomous Vehicles With Highest Priority

Yiming Shu (The University of HongKong, Hong Kong); Jingyuan Zhou (National University of Singapore, Singapore); Fu Zhang (The University of HongKong, Hong Kong)

Refining Obstacle Perception Safety Zones via Maneuver-Based Decomposition

Sever I Topan, Yuxiao Chen, Edward Schmerling, Karen Leung, Jonas Nilsson, Michael Cox and Marco Pavone (NVIDIA Corp., USA)

Biased Target-Tree* Algorithm With RRT* for Reducing Parking Path Planning Time

Joonwoo Ahn, Minsoo Kim and Jaeheung Park (Seoul National University, Korea (South))

Geometric Deep Learning for Autonomous Driving: Unlocking the Power of Graph Neural Networks With CommonRoad-Geometric

Eivind Meyer, Maurice Brenner, Bowen Zhang, Max Schickert and Bilal Musani (Technical University of Munich, Germany); Matthias Althoff (Technische Universität München, Germany)

Global Path Planning of UGVs in Large-Scale Off-Road Environment Based on Improved A-Star Algorithm and Quadratic Programming

Junkai Jiang, Zeyu Han, Jinhao Li, Yuning Wang, Jianqiang Wang and Shaobing Xu (Tsinghua University, China)

TSGN: Temporal Scene Graph Neural Networks With Projected Vectorized Representation for Multi-Agent Motion Prediction

Yunong Wu (Technical University of Munich & MINES ParisTech, PSL University, Germany); Thomas Gilles (Mines Paris - PSL & Huawei Technologies France, France); Bogdan Stanculescu (Mines ParisTech, France); Fabien Moutarde (MINES Paris PSL, France)

Online Time-Optimal Trajectory Planning on Three-Dimensional Race Tracks

Matthias Rowold, Levent Ögretmen and Ulf Kasolowsky (Technical University of Munich, Germany); Boris Lohmann (Technische Universität München, Germany)

Hybrid Decision Making for Autonomous Driving in Complex Urban Scenarios

Rodrigo Gutierrez-Moreno (Universidad de Alcalá, Spain); Rafael Barea (University of Alcalá, Spain); Elena López-Guillén, Felipe Arango and Navil Abdeselam (Universidad de Alcalá, Spain); Luis M. Bergasa (University of Alcalá, Spain)

16:00 - 17:30

P15: Advanced Driver Assistance Systems (Interactive Poster)

Room: Tubughnenq' 5 (2nd floor)

Chair: Catherine Lollett (Waseda University, Japan)

Unified Pedestrian Path Prediction Framework: A Comparison Study

Jarl L.A. Lemmens, Ariyan Bighashdel and Pavol Jancura (Eindhoven University of Technology, The Netherlands); Gijs Dubbelman (Technische Universiteit Eindhoven, The Netherlands)

Efficient-DASH: Automated Radar Neural Network Design Across Tasks and Datasets

Thomas Boot (Eindhoven University of Technology, The Netherlands); Nicolas Cazin and Willem P Sanberg (NXP Semiconductors, The Netherlands); Joaquin Vanschoren (Eindhoven University of Technology, The Netherlands)

Technical Program - Tuesday, June 6

Textual Explanations for Automated Commentary Driving

Marc Alexander Kühn (UVC Partners, Germany); Daniel Omeiza and Lars Kunze (University of Oxford, United Kingdom (Great Britain))

Nearby Unsafe Driving Detection

Seyhan Ucar (Toyota Motor North America R&D, InfoTech Labs, USA); Emrah Akin Sisbot (InfoTech Labs, Toyota Motor North America, USA); Haritha Muralidharan (InfoTech Labs, Toyota Motor North America R&D, USA); Kentaro Oguchi (Toyota Motor North America R&D, InfoTech Labs, USA)

Multi-Object Tracking, Segmentation and Validation in Thermal Images

Mircea P Muresan, Radu G Danescu and Sergiu Nedevschi (Technical University of Cluj-Napoca, Romania)

Exploring Energy Impacts of Cyberattacks on Adaptive Cruise Control Vehicles

Tianyi Li and Benjamin Rosenblad (University of Minnesota, USA); Shian Wang (The University of Texas at El Paso, USA); Mingfeng Shang and Raphael Stern (University of Minnesota, USA)

Deer in the Headlights: FIR-Based Future Trajectory Prediction in Nighttime Autonomous Driving

Alireza Rahimpour (Ford Motor Company, USA); Navid Fallahinia (University of Utah, USA); Devesh Upadhyay and Justin Miller (Ford, USA)

Verifiable and Robust Monitoring and Alerting System for Road Safety by AI Based Consensus Development on Blockchain

Reshu Verma (Indian Institute of Technology Hyderabad, India); Vishnu Vs (IIT Hyderabad, USA); Kotaro Kataoka (Indian Institute of Technology Hyderabad, India)

Technical Program - Wednesday, June 7

8:30 - 9:50

J7: Journal Presentation 7 (Oral)

Room: Kahtnu 1 (2nd floor)

Chair: Ahmed Hussein (IAV GmbH, Germany)

Towards Guaranteed Safety Assurance of Automated Driving Systems With Scenario Sampling: An Invariant Set Perspective

Bowen Weng (The Ohio State University & Transportation Research Center Inc., USA); Linda Capito, Ümit Özgüner and Keith Redmill (The Ohio State University, USA)

A Finite-Sampling, Operational Domain Specific, and Provably Unbiased Connected and Automated Vehicle Safety Metric

Bowen Weng (The Ohio State University & Transportation Research Center Inc., USA); Linda Capito, Ümit Özgüner and Keith Redmill (The Ohio State University, USA)

Towards a Complete Safety Framework for Longitudinal Driving

Galina Sidorenko (Halmstad University, Sweden); Aleksei Fedorov (Lund University, Sweden); Alexey Vinel and Johan Thunberg (Halmstad University, Sweden)

Taxonomy to Unify Fault Tolerance Regimes for Automotive Systems: Defining Fail-Operational, Fail-Degraded, and Fail-Safe

Torben Stolte (Technische Universität Braunschweig & Institute of Control Engineering, Germany); Stefan Ackermann (Technische Universität Darmstadt, Germany); Robert Graubohm (Technische Universität Braunschweig, Germany); Inga Jatzkowski (Technische Universität Braunschweig & Institute of Control Engineering, Germany); Björn Klamann and Hermann Winner (Technische Universität Darmstadt, Germany); Markus Maurer (TU Braunschweig, Germany)

8:30 - 9:50

O7: Advanced Driver Assistance Systems (Oral)

Room: Tikahtnu CDEF (3rd floor ballroom)

Chair: Christian Berger (University of Gothenburg, Sweden)

Normalized Facial Features-Based DNN for a Driver's Gaze Zone Classifier Using a Single Camera Robust to Various Highly Challenging Driving Scenarios

Catherine Lollett (Waseda University, Japan); Mitsuhiro Kamezaki (The University of Tokyo, Japan); Shigeki Sugano (Japan)

RESET: Revisiting Trajectory Sets for Conditional Behavior Prediction

Julian Schmidt (Mercedes-Benz AG & Ulm University, Germany); Pascal Huisel (Mercedes-Benz AG, Germany); Julian Wiederer (Friedrich-Alexander-Universität Erlangen-Nürnberg & Mercedes-Benz AG, Germany); Julian Jordan (Mercedes-Benz AG, Germany); Vasileios Belagiannis (Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany); Klaus Dietmayer (Ulm University, Germany)

Intention-Aware Lane Keeping Assist Using Driver Gaze Information

John Dahl (Chalmers University of Technology & Zenseact, Sweden); Gabriel Rodrigues de Campos (Zenseact, Sweden); Jonas Fredriksson (Chalmers University of Technology, Sweden)

ZEBRA: Z-Order Curve-Based Event Retrieval Approach to Efficiently Explore Automotive Data

Christian Berger (University of Gothenburg, Sweden); Lukas Birkemeyer (Technische Universität Braunschweig, Germany)

9:50 - 11:20

P16: Collision Avoidance / Pedestrian Protection (Interactive Poster)

Room: Kahtnu 2 (2nd floor)

Chair: Antonello Cherubini (University of Trento, Italy)

Interaction-Aware Predictive Collision Detector for Human-Aware Collision Avoidance

Thomas Genevois (Université Grenoble Alpes, INRIA, France); Anne Spalanzani (Pierre-Mendès-France University, France); Christian Laugier (INRIA, France)

HyLEAR: Hybrid Deep Reinforcement Learning and Planning for Safe and Comfortable Automated Driving

Dikshant Gupta (Saarland University, Germany); Matthias Klusch (DFKI, Germany)

Time-To-Collision-Aware Lane-Change Strategy Based on Potential Field and Cubic Polynomial for Autonomous Vehicles

Pengfei Lin (the University of Tokyo, Japan); Ehsan Javanmardi (The University of Tokyo, Japan); Ye Tao (the University of Tokyo, Japan); Vishal Chauhan (The University of Tokyo, Japan); Jin Nakazato (University of Tokyo, Japan); Manabu Tsukada (the University of Tokyo, Japan)

STRETCH: Generating Challenging Scenarios for Testing Collision Avoidance Systems

Franz Scheuer (University of Passau, Germany); Alessio Gambi (IMC University of Applied Sciences, Austria); Paolo Arcaini (National Institute of Informatics, Japan)

Formal Verification of Safety Architectures for Automated Driving

Clovis Eberhart (National Institute of Informatics, Japan); Jeremy Dubut (National Institute of Advanced Industrial Science and Technology & National Institute of Informatics, Japan); James Haydon and Ichiro Hasuo (National Institute of Informatics, Japan)

Technical Program - Wednesday, June 7

Cross or Wait? Predicting Pedestrian Interaction Outcomes at Unsignalized Crossings

Chi Zhang (University of Gothenburg, Sweden); Amir Hossein Kalantari and Yue Yang (University of Leeds, United Kingdom (Great Britain)); Zhongjun Ni (Linköping University, Sweden); Gustav Markkula and Natasha Merat (University of Leeds, United Kingdom (Great Britain)); Christian Berger (University of Gothenburg, Sweden)

The IMPTC Dataset: An Infrastructural Multi-Person Trajectory and Context Dataset

Manuel Hetzel and Hannes Reichert (University of Applied Sciences Aschaffenburg, Germany); Guenther Reitberger (Universitaet Passau, Germany); Konrad Doll (University of Applied Sciences Aschaffenburg, Germany); Bernhard Sick (University of Kassel, Germany); Erich Fuchs (Universitaet Passau, Germany)

Preventing Errors in Person Detection: A Part-Based Self-Monitoring Framework

Franziska Schwaiger (Fraunhofer IKS, Fraunhofer Institute for Cognitive Systems IKS, Germany); Andrea Matic and Karsten Roscher (Fraunhofer IKS, Germany); Stephan Günnemann (Technical University Munich, Germany)

ForceFormer: Exploring Social Force and Transformer for Pedestrian Trajectory Prediction

Weicheng Zhang (Leibniz University Hannover, Germany); Hao Cheng (ITC Faculty Geo-Information Science and Earth Observation & Leibniz University Hannover, The Netherlands); Monika Sester (Leibniz University Hannover, Germany); Fatema T. Johora (Clausthal University of Technology, Germany)

Energy Costs of Safe Speed Policies in a Pedestrian-Crossing Scenario

Antonello Cherubini, Gastone Pietro Rosati Papini, Alice Plebe and Mauro Da Lio (University of Trento, Italy)

Using Collision Momentum in Deep Reinforcement Learning Based Adversarial Pedestrian Modeling

Dianwei Chen, Ekim Yurtsever, Keith Redmill and Ümit Özgüner (The Ohio State University, USA)

9:50 - 11:20

P17: Automated Vehicles 3 (Interactive Poster)

Room: Tubughnenq' 3 (2nd floor)

Chair: Thomas Nürnberg (Robert Bosch GmbH, Germany)

Latency Measurement for Autonomous Driving Software Using Data Flow Extraction

Tobias Betz, Maximilian Schmeller, Andreas Korb and Johannes Betz (Technical University of Munich, Germany)

Learning-Enabled Multi-Modal Motion Prediction in Urban Environments

Vinicius Trentin (CSIC, Spain); Chenxu Ma (TU Delft, The Netherlands); Jorge Villagra (CSIC, Spain); Zaid Al-Ars (Delft University of Technology, The Netherlands)

Assessing Safe Autonomous Vehicle Behavior via Large Scale Traffic Simulation

Pradeep Sharma Oruganti (The Ohio State University, USA); Eeshan Deosthale and Cristhian Lizarazo Jimenez (Motional, USA)

HD Map Generation From Noisy Multi-Route Vehicle Fleet Data on Highways With Expectation Maximization

Fabian Immel (FZI Research Center for Information Technology, Germany); Richard Fehler (Karlsruhe Institute of Technology & FZI Research Center for Information Technology, Germany); Mohammad M Ghanaat, Florian Ries and Martin Hauéis (Mercedes-Benz AG, Germany); Christoph Stiller (Karlsruhe Institute of Technology, Germany)

Structured Natural Language for Expressing Rules of the Road for Automated Driving Systems

Patrick Irvine, Antonio A Bruto da Costa, Xizhe Zhang, Siddhartha Khastgir and Paul Jennings (University of Warwick, United Kingdom (Great Britain))

Bridging the Gap Between Multi-Step and One-Shot Trajectory Prediction via Self-Supervision

Faris Janjos and Max Keller (Bosch Corporate Research, Germany); Maxim Dolgov (Intelligent Sensor-Actuator Systems Laboratory, Germany); J. Marius Zöllner (FZI Research Center for Information Technology, Germany)

FGNet: A Graph-Based Motion Forecasting Method From a Future Perspective

Xiaqiang Tang, Yafeng Guo and Yiyang Sun (Tongji University, China); Siyuan Hu (China); Jun Wang (Tongji University, China)

Learning Pedestrian Actions to Ensure Safe Autonomous Driving

Jia Huang (Texas A&M University, USA); Alviqa Gautam (Texas A & M University, USA); Srikanth Saripalli (Texas A&M University, USA)

Self-Supervised Occupancy Grid Map Completion for Automated Driving

Jugoslav Stojcheski (University of Tübingen, Germany); Thomas Nürnberg, Michael Ulrich, Thomas Michalke and Claudius Gläser (Robert Bosch GmbH, Germany); Andreas Geiger (University of Tübingen, Germany)

Risk Assessment and Management Based on Neuro-Fuzzy System for Safe and Flexible Navigation in Unsignalized Intersection

Kevin Bellingard (Heudiasyc & Sherpa, France); Lounis Adouane (Université de Technologie de Compiègne, France); Fabrice Peyrin (Sherpa Engineering, France)

Technical Program - Wednesday, June 7

9:50 - 11:20

P18: IV related Image, Radar, Lidar Signal Processing (Interactive Poster)

Room: Tubughnenq' 4 (2nd floor)

Chair: Jason L Clemons (NVIDIA, USA)

LIDAR Point Cloud Translation Between Snow and Clear Conditions Using Depth Images and GANs

Yuxiao Zhang (Nagoya University, Japan); Ming Ding (Zhejiang Fubang Technology, China); Hanqing Yang (Nagoya University, Japan); Yingjie Niu (Nagoya University & Graduate School of Informatics, Japan); Yan Feng and Maoning Ge (Nagoya University, Japan); Alexander Carballo (Gifu University & Nagoya University, Japan); Kazuya Takeda (Nagoya University, Japan)

Synthesizing Realistic Snow Effects in Driving Images Using GANs and Real Data With Semantic Guidance

Hanqing Yang (Nagoya University, Japan); Ming Ding (Zhejiang Fubang Technology, China); Alexander Carballo (Gifu University & Nagoya University, Japan); Yuxiao Zhang and Kento Ohtani (Nagoya University, Japan); Yingjie Niu (Nagoya University & Graduate School of Informatics, Japan); Maoning Ge, Yan Feng and Kazuya Takeda (Nagoya University, Japan)

Sensor Equivariance by LiDAR Projection Images

Hannes Reichert, Manuel Hetzel, Steven Schreck and Konrad Doll (University of Applied Sciences Aschaffenburg, Germany); Bernhard Sick (University of Kassel, Germany)

Cross Dataset Analysis and Network Architecture Repair for Autonomous Car Lane Detection

Parth Ganeriwala and Siddhartha Bhattacharyya (Florida Institute of Technology, USA); Raja Muthalagu (Birla Institute of Technology and Science Pilani, Dubai Campus, United Arab Emirates)

Low-Complexity Deep HDR Fusion and Tone Mapping for Urban Traffic Scenes

Ivana Shopovska (Ghent University, Belgium); Jan Aelterman (Ghent University-IMEC & IMEC, Belgium); David Van Hamme and Wilfried Philips (Ghent University, Belgium)

Varying Road Surface Condition Estimation

Hasith Karunasekera, Albin Daniel Ekström, Amanda Siklund, Erik Hansson, Filip Anjou, Max Adolfsson, Vincent Carlson and Jonas Sjöberg (Chalmers University of Technology, Sweden)

HD2Reg: Hierarchical Descriptors and Detectors for Point Cloud Registration

Canhui Tang, Yiheng Li, Shaoyi Du, Guofa Wang and Zhiqiang Tian (Xi'an Jiaotong University, China)

FPGA-Based Acceleration of Lidar Point Cloud Processing and Detection on the Edge

Cecilia Latotzke and Amarin Kloeker (RWTH Aachen University, Germany); Simon Schöning (RWTH Aachen, Germany); Fabian Kemper (RWTH Aachen & RWTH, Germany); Mazen Slimi (RWTH Aachen University, Germany); Lutz Eckstein (RWTH Aachen University, Institute for Automotive Engineering, Germany); Tobias Gemmeke (RWTH Aachen University, Germany)

Using Deep Learning to Classify Road Surface Conditions and to Estimate the Coefficient of Friction

Jens-Patrick A. B. Langstrand, Hans Olav Randem, Harald P-J Thunem and Mario Hoffmann (Institute for Energy Technology, Norway)

Spiking Neural Networks for Robust and Efficient Object Detection in Intelligent Transportation Systems With Roadside Event-Based Cameras

Mikihiro Ikura (University of Tokyo, Japan); Florian Walter and Alois Knoll (Technical University Munich Garching, Germany)

An Efficient Tracking Method Based on Multipath Utilization in Traffic Scenarios

XiaoXi Ma (University of Electronic Science and Technology of China, China); Haoran Wang (University of Electronic Science and Technology of China); Yuanhang Wu, Chenyu Zhang and Wei Yi (University of Electronic Science and Technology of China, China)

Design Hybrid Computing Architecture for Accelerating Point Cloud Registration

Xiao Wang, Xiaodong Deng, Yingxiang Li, Shitao Chen, Longjun Liu and Nanning Zheng (Xi'an Jiaotong University, China)

Homography Estimation for Camera Calibration in Complex Topological Scenes

Giacomo D'Amicantonio (Technological University of Eindhoven, The Netherlands); Peter H.N. de With (Eindhoven University of Technology, The Netherlands); Egor Bondarev (Eindhoven University of Technology & IVRA Holding, The Netherlands)

Urban-StyleGAN: Learning to Generate and Manipulate Images of Urban Scenes

George Eskandar (University of Stuttgart, Germany); Youssef Farag and Tarun Yenamandra (Technical University of Munich, Germany); Daniel Cremers (TU Munich, Germany); Karim Guirguis (Robert Bosch GmbH, Germany); Bin Yang (University of Stuttgart, Germany)

Improving Extrinsic Between RADAR and LIDAR Using Learning

Peng Jiang and Srikanth Saripalli (Texas A&M University, USA)

Technical Program - Wednesday, June 7

11:20 - 12:40

J8: Journal Presentation 8 (Oral)

Room: Kahtnu 1 (2nd floor)

Chair: Johannes Betz (Technical University of Munich, Germany)

Autonomous Vehicles on the Edge: A Survey on Autonomous Vehicle Racing

Johannes Betz (Technical University of Munich, Germany); Hongrui Zheng (University of Pennsylvania, USA); Alexander Liniger (ETH Zurich, Switzerland); Ugo Rosolia (University of California, Berkeley, USA); Phillip Karle (Technical University of Munich, Germany); Madhur Behl (University of Virginia, USA); Venkat N Krovi (Clemson University, USA); Rahul Mangharam (University of Pennsylvania, USA)

Explanations in Autonomous Driving: A Survey

Daniel Omeiza and Lars Kunze (University of Oxford, United Kingdom (Great Britain)); Helena Webb (University of Nottingham, United Kingdom (Great Britain)); Marina Jirotko (University of Oxford, United Kingdom (Great Britain))

Towards Compact Autonomous Driving Perception With Balanced Learning and Multi-Sensor Fusion

Oskar Natan (Toyohashi University of Technology, Japan & Universitas Gadjah Mada, Indonesia); Jun Miura (Toyohashi University of Technology, Japan)

End-To-End Autonomous Driving With Semantic Depth Cloud Mapping and Multi-Agent

Oskar Natan (Toyohashi University of Technology, Japan & Universitas Gadjah Mada, Indonesia); Jun Miura (Toyohashi University of Technology, Japan)

11:20 - 12:40

O8: Automated Vehicles 2 (Oral)

Room: Tikahtnu CDEF (3rd floor ballroom)

Chair: Jamison Heard (Rochester Institute of Technology, USA)

Gap Approaching Intelligent Driver Model for Interactive Simulation of Merging Scenarios

Johannes Fischer, Etienne Bührle and Christoph Stiller (Karlsruhe Institute of Technology, Germany)

Interaction and Decision Making-Aware Motion Planning Using Branch Model Predictive Control

Rui Oliveira (KTH Royal Institute of Technology, Sweden); Siddharth H. Nair (UC Berkeley, USA); Bo Wahlberg (KTH - Royal Institute of Technology, Sweden)

Improving Cross-Domain Semi-Supervised Object Detection With Adversarial Domain Adaptation

Maximilian Menke and Thomas Wenzel (Robert Bosch GmbH, Germany); Andreas Schwung (South Westphalia University of Applied Science, Germany)

Connecting the Dots: Context-Driven Motion Planning Using Symbolic Reasoning

Chris van der Ploeg (TNO & Eindhoven University of Technology, The Netherlands); Michiel Braat (TNO Netherlands Organisation for Applied Scientific Research, The Netherlands); Beatrice Masini, Jochem Brouwer and Jan-Pieter Paardekooper (TNO, The Netherlands)

14:40 - 15:40

J9: Journal Presentation 9 (Oral)

Room: Kahtnu 1 (2nd floor)

Chair: Simone Mentasti (Politecnico di Milano, Italy)

Situation-Aware Environment Perception Using a Multi-Layer Attention Map

Matti Henning (Ulm University, Germany); Johannes Christian Müller (Robert Bosch GmbH, Germany); Fabian Gies, Michael Buchholz and Klaus Dietmayer (Ulm University, Germany)

Drivable Region Estimation for Self-Driving Vehicles Using Radar

Muhammad Ishfaq Hussain (Gwangju Institute of Science and Technology, Korea (South))

Clothoid-Based Lane-Level High-Definition Maps: Unifying Sensing and Control Models

Paolo Cudrano (Politecnico di Milano, Italy); Barbara Gallazzi (Cariad SE, Germany); Matteo Frosi, Simone Mentasti and Matteo Matteucci (Politecnico di Milano, Italy)

14:40 - 16:00

O9: Vehicle Environment Perception 2 (Oral)

Room: Tikahtnu CDEF (3rd floor ballroom)

Chair: Jose M. Alvarez (Nvidia, USA)

AOP-Net: All-In-One Perception Network for LiDAR-Based Joint 3D Object Detection and Panoptic Segmentation

Yixuan Xu (University of Toronto, Canada); Hamidreza Fazlali (Noah's Ark Lab, Huawei Technologies, Canada); Yuan Ren and Bingbing Liu (Noah Ark Lab, Canada)

Active Excitations for Maximum Friction Coefficient Estimation

Nicolas Lampe (Osnabrück University of Applied Sciences, Germany); Karl-Philipp Kortmann (Leibniz University Hannover, Germany); Clemens Westerkamp (University of Applied Sciences Osnabrück, Germany); Hans-Georg Jacob (Leibniz University Hannover, Germany)

Technical Program - Wednesday, June 7

Towards Establishing Classification Requirements for Automated Driving

Ken T. Mori (Technische Universität Darmstadt, Germany); Trent Brown (Virginia Tech & Boise State University, USA); Steven Peters (Technische Universität Darmstadt, Germany)

Raw Radar Data Based Object Detection and Heading Estimation Using Cross Attention

Ravi Kothari (AVL Software and Functions GmbH, Germany); Ali Kariminezhad (Robert Bosch GmbH, Germany); Christian Mayr (efs TechHub GmbH, Germany); Haoming Zhang (Institute of Automatic Control, RWTH Aachen University, Germany)

16:00 - 17:30

P19: Vehicle Environment Perception 4 (Interactive Poster)

Room: Kahtnu 2 (2nd floor)

Chair: Kenrick Mock (University of Alaska, USA)

Seatbelt Segmentation Using Synthetic Images

Sumit Jha (University of Texas at Dallas, USA); Isaac Brooks (The University of Texas at Dallas, USA); Soumitry J. Ray (EdgeTensor, India); Rajesh Narasimha (Texas Instruments, USA); Naofal Al-Dhahir and Carlos A Busso (University of Texas at Dallas, USA)

PeSOTIF: A Challenging Visual Dataset for Perception SOTIF Problems in Long-Tail Traffic Scenarios

Peng Liang, Jun Li, Wenbo Shao and Hong Wang (Tsinghua University, China)

PMR-CNN: Prototype Mixture R-CNN for Few-Shot Object Detection

Jiancong Zhou (Zhejiang Laboratory, China & Hangzhou Institute for Advanced Study, UCAS, China); Jilin Mei (Institute of Computing Technology, Chinese Academy of Sciences & Zhejiang Laboratory, China); Haoyu Li (Zhejiang Laboratory, China); Yu Hu (Institute of Computing Technology, Chinese Academy of Sciences, China)

Hardware-Aware Latency Pruning for Real-Time 3D Object Detection

Maying Shen (NVIDIA, USA); Lei Mao, Joshua Chen, Justin Hsu and Xinglong Sun (Nvidia, USA); Oliver Knieps (NVIDIA, USA); Carmen Maxim and Jose M. Alvarez (Nvidia, USA)

Robust Traffic Light Detection Using Saliency-Sensitive Loss: Computational Framework and Evaluations

Ross Greer (University of California, San Diego, USA); Akshay Gopalkrishnan, Jacob Landgren, Lulua Rakla and Anish Gopalan (University of California San Diego, USA); Mohan M Trivedi (University of California, USA)

M2F2-Net: Multi-Modal Feature Fusion for Unstructured Off-Road Freespace Detection

Hongliang Ye (Zhejiang Lab, China); Jilin Mei (Institute of Computing Technology, Chinese Academy of Sciences & Zhejiang Laboratory, China); Yu Hu (Institute of Computing Technology, Chinese Academy of Sciences, China)

Open-World Driving Scene Segmentation via Multi-Stage and Multi-Modality Fusion of Vision-Language Embedding

Yingjie Niu (Nagoya University & Graduate School of Informatics, Japan); Ming Ding (Zhejiang Fubang Technology, China); Yuxiao Zhang, Maoning Ge, Hanting Yang and Kazuya Takeda (Nagoya University, Japan)

End-To-End Lidar-Camera Self-Calibration for Autonomous Vehicles

Arya Rachman (University of Erlangen-Nuremberg & AVL Software and Functions, Germany); Jurgen Seiler and Andre Kaup (University of Erlangen-Nuremberg, Germany)

16:00 - 17:30

P20: Autonomous / Intelligent Robotic Vehicles 3 (Interactive Poster)

Room: Tubughnenq' 3 (2nd floor)

Chair: Fawzi Nashashibi (INRIA, France)

Learning and Adapting Behavior of Autonomous Vehicles Through Inverse Reinforcement Learning

Rainer Trauth (Technical University of Munich, Germany & Institute of Automotive Technology, Germany); Marc Kaufeld (Technical University of Munich, Germany); Maximilian Geisslinger (Technical University of Munich & Institute of Automotive Technology, Germany); Johannes Betz (Technical University of Munich, Germany)

Towards Explainability in Modular Autonomous System Software

Hongrui Zheng, Zirui Zang, Shuo Yang and Rahul Mangharam (University of Pennsylvania, USA)

Experience Filter: Using Past Experiences on Unseen Tasks or Environments

Anil Yildiz, Esen Yel, Anthony L. Corso and Kyle H. Wray (Stanford University, USA); Stefan J. Witwicki (Nissan Motors, USA); Mykel J Kochenderfer (Stanford University, USA)

Optimal Routing of Modular Agents on a Graph

Karan Suresh Jagdale (University of Illinois Urbana Champaign, USA); Melkior Ornik (University of Illinois Urbana-Champaign, USA)

Physics Constrained Motion Prediction With Uncertainty Quantification

Renukanandan Tumu (University of Pennsylvania, USA); Lars Lindemann (University of Southern California, USA); Rahul Mangharam (University of Pennsylvania, USA); Truong X Nghiem (Northern Arizona University, USA)

Interpretable Goal-Based Model for Vehicle Trajectory Prediction in Interactive Scenarios

Amina Ghoul (Paris SORBONNE & INRIA, France); Fawzi Nashashibi and Anne Verroust-Blondet (INRIA, France); Itheri Yahiaoui (Université de Reims Champagne-Ardenne, France)

Technical Program - Wednesday, June 7

Model-Predictive Control With Parallelised Optimisation for the Navigation of Autonomous Mining Vehicles

Gjorgji Nikolovski (MASCOR Institute of FH Aachen & FH Aachen, Germany); Nicolas Limpert, Hendrik Nessau, Michael Reke and Alexander Ferrein (MASCOR Institute of FH Aachen, Germany)

16:00 - 17:30

P21: Connected & Cooperative Vehicles 3 (Interactive Poster)

Room: Tubughnenq' 4 (2nd floor)

Chair: Gábor Orosz (University of Michigan, USA)

Space-Time Conflict Spheres for Constrained Multi-Agent Motion Planning

Anirudh S Chari (Illinois Mathematics and Science Academy, USA); Rui Chen and Changliu Liu (Carnegie Mellon University, USA)

Improving Infrastructure and Community Resilience With Shared Autonomous Electric Vehicles (SAEV-R)

Jiangbo Yu and Michael F. Hyland (University of California, Irvine, USA); Anthony Chen (Hong Kong Polytechnic University, Hong Kong)

Distributed Cooperative Control for Autonomous Vehicles Considering the Driving Behavior Compatibility

Haoran Li (Wuhan University of Science and Technology & Tsinghua University Suzhou Automotive Research Institute, China); Tingyang Zhang (Wuhan University of Science and Technology, China); Sifa Zheng (School of Vehicle and Mobility, Tsinghua University & Tsinghua University Suzhou Automotive Research Institute, China); Chuan Sun (Tsinghua University Suzhou Automotive Research Institute, China)

UCLF: An Uncertainty-Aware Cooperative Lane-Changing Framework for Connected Autonomous Vehicles in Mixed Traffic

Yijun Mao, Yan Ding, Chongshan Jiao and Pengju Ren (Xi'an Jiaotong University, China)

Distributed Auction Algorithm-Based Online Scheduling for Multi-AGV in Automated Warehouse System

Xiaowei Wang (Hunan University & Wuxi Intelligent Control Research Institute of Hunan University, China); Jiaxuan Wu (Hunan University, China); Yougang Bian (Hunan University & Wuxi Intelligent Control Research Institute of Hunan University, China); Yang LI (Hunan University & Wuxi Intelligent Control Research Institute of Hunan University, China); Manjiang Hu and Biao Xu (Hunan University & Wuxi Intelligent Control Research Institute of Hunan University, China)

Experimental Validation of Intent Sharing in Cooperative Maneuvering

Hao M. Wang (University of Michigan, USA); Sergei Avedisov and Onur Altintas (Toyota Motor North America R&D, InfoTech Labs, USA); Gábor Orosz (University of Michigan, USA)

A Scaled Experiment Platform to Study Interactions Between Humans and CAVs

Patrick Scheffe and Bassam Alrifaae (RWTH Aachen University, Germany)

An Optimized Scheduling Method With Dynamic Conflict Graph for Connected and Automated Vehicles at Multi-Lane On-Ramp Areas

Jia Shi, Yugong Luo, Pengfei Li, Yunhao Hu and Keqiang Li (Tsinghua University, China)

Data-Driven Predictive Connected Cruise Control

Minghao Shen and Gábor Orosz (University of Michigan, USA)

16:00 – 17:30

P22: Eco-driving / Electric and Hybrid Vehicles / Software Security (Interactive Poster)

Room: Tubughnenq' 5 (2nd floor)

Chair: Dawei Chen (InfoTech Labs, Toyota North America R&D, USA)

Robust Consumption Planning for Uncertain Power Demand

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Bare-Metal vs. Hypervisors and Containers: Performance Evaluation of Virtualization Technologies for Software-Defined Vehicles

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