

2019 CCAT Global Symposium on Connected and Automated Vehicles and Infrastructure

Washtenaw Community College Ann Arbor, MI

Driven by the rapid development of connected and automated vehicle (CAV) technologies, we are on the cusp of a new revolution in transportation safety and mobility on a scale not seen since the introduction of automobiles a century ago. As CAV technologies continue their steady advance towards deployment, many questions remain, whose answer are critical.

The 2019 Global Symposium for Connected and Automated Vehicles and Infrastructure will focus on overarching research issues related to CAV research, technology, testing and deployments, policy, as well as education, training, and workforce development. The Symposium is sponsored by the U.S. Department of Transportation's Center for Connected and Automated Transportation (CCAT) at the University of Michigan.

February 26

7:30 — 8:30	Continental Breakfast
8:30 — 8:45	Welcome, Opening Remarks Dr. Henry Liu , CCAT Director
8:45 — 9:30	Keynote Speaker Marcy Klevorn , Executive Vice President of Mobility, Ford Motor Company
9:30 — 10:30	International Panel on Connected and Automated Vehicles – This panel will explore connected and automated vehicle testing and deployments in the U.S. and abroad. The panel will discuss both DSRC and CV2X; development and deployment of automated vehicles, level 3 and above; and AV testing. Moderator: Scott Belcher, President and CEO SFB Consulting Speakers: Dr. Jim Sayer, Director, UMTRI Sue Bai, Principal Engineer, Honda R&D Americas Andreas Mai, CEO & Founder, ecomo.world LLC Vince Park, Senior Director of Engineering, Qualcomm
10:30 — 11:00	Break
11:00 — 12:00	Research Topic 1: CAV Testing Scenario Design and Implementation using Naturalistic Driving Data and Augmented

	<p>Reality – Testing and evaluation is a critical step in the development and deployment of connected and automated vehicles (CAVs), and yet there is no systematic way to design representative scenarios for validating CAV systems. This presentation will detail how to generate testing scenario libraries for CAV evaluation systematically by mining and examining crash and naturalistic driving databases. Additionally, CAV testing in closed test facilities with an augmented reality environment is also discussed.</p> <p>Dr. Yiheng Feng, Associate Research Scientist, UMTRI</p> <p>Panel 1: Smart Cities Prepare for the Future of Mobility – This panel will explore how cities are preparing for a truly smart, livable, economically vibrant future by discussing three key themes: (1) performance and resilience; (2) vision and leadership; and (3) service and inclusion.</p> <p>Moderator: Jeff Hood, Principal, Deloitte Consulting LLP</p> <p>Speakers: Vig Krishnamurthy, Senior Manager, City Solutions (Ford Motor Company Smart Mobility) Raymond Hess, Transportation Manager at City of Ann Arbor John Peracchio, General Manager – Mobility Solutions & Strategy at Conduent, former Governor Snyder Mobility Lead Dr. John Abraham, Director of Traffic and Operations, Macomb County Department of Roads Alisyn Malek, Co-Founder of May Mobility</p>
12:00 — 1:00	Lunch
1:00 — 2:00	<p>Research Topic 2: Purdue Driving Simulator – Having conducted a wide range of CCAT research using the Purdue driving simulator, this topic will explore drivers’ response to different types of real-time traffic information; rationale and methods used in investigating the effect of different AV driver introductory materials on trust, acceptance, and takeover performance for Level 3 automation; and plans to investigate the effects of different road designs on user acceptance of AVs and their willingness to purchase L4 AVs.</p> <p>Dr. Dustin J. Souders, Purdue University</p>

	<p>Panel 2: Leadership, Education, and Professional Development – Education and professional development are critical to the successful deployment of connected and automated vehicle technologies in industry. The need exists for both engineers as well as skilled technicians in the product development process. This panel will focus on how Washtenaw Community College is providing career pathway solutions for talent that meet industry demanded skills and competencies.</p> <p>Moderator: Al Lecz, Director, Advanced Transportation Center at Washtenaw Community College</p> <p>Speakers: Dr. Michelle Mueller, Vice President of Economic, Community, and College Development at Washtenaw Community College Dr. Kimberly Hurns, Vice President for Instruction at Washtenaw Community College Hideki Hada, Executive Engineer, Technical Strategy for Advanced Safety, Toyota Motor NA Rosa Lechartier, WCC Student Zach VanBuren, WCC Student Emily Hatsigeorgiou, WCC Student</p>
2:00 — 2:30	Break
2:30 — 3:15	<p>Smart Cities Presentation Eugene W. Grant, Mayor, Seat Pleasant, Maryland</p>
3:15 — 4:15	Smart Cities Student Contest — Presentations and Awards
4:15 — 4:30	Wrap-Up
4:30 — 6:00	Reception and Strolling Dinner

February 27

7:30 — 8:30	Continental Breakfast
8:30 — 8:45	Welcome, Opening Remarks Dr. Rose Bellanca , President and CEO, Washtenaw Community College
8:45 — 9:30	Keynote Speaker Shailen Bhatt , CEO, ITS America
9:30 — 10:45	Keynote and Panel Discussion:

	<p>Shaping the Future of Mobility with Connected and Automated Vehicles</p> <p>Moderator: Dr. S. Jack Hu, Vice President for Research, University of Michigan</p> <p>Featuring: Dr. Lawrence Burns, former Professor of Engineering Practice at U-M, and author, will share his perspectives on how the “age of automobility” will likely play out over the next five to ten years and what this might mean for consumers, industry, researchers and society</p> <p>Speakers: Dr. Kumares Sinha, Purdue University Dr. Huei Peng, University of Michigan</p>
10:45 — 11:00	Break
11:00 — 12:00	<p>Research Topic 1A: Efficient and Fast Algorithms for Real-Time Management of Connected Vehicles – Future transportation management systems can exploit advances in approximation theory and scientific computing to produce analytics and inform control actions in a real time fashion. Towards this goal, we aim to address two challenges: (1) data flood and (2) expensive simulation models.</p> <p>Dr. Hadi Meidani, University of Illinois, Urbana-Champaign</p> <p>Research Topic 1B: Autonomous Freight Transportation: Some Opportunities and Challenges – This talk discusses some opportunities and challenges associated with the emerging freight delivery systems based on autonomous trucks and drones. Topics include spatial formation and temporal scheduling of truck platoons for line-haul shipments, as well as optimal layout of transshipments for last mile deliveries. We discuss how autonomous truck platooning with properly planned lateral displacements can increase shipment capacity and fuel efficiency without significantly accelerating the damage accumulation within pavement structures. We also show how to minimize the last-mile delivery cost by drones, with or without considering mid-air congestion and continuous traffic equilibrium.</p>

	<p>Dr. Yanfeng Ouyang, George Krambles Endowed Professor, Department of Civil and Environmental Engineering University of Illinois, Urbana-Champaign</p> <p>Panel 1: Policy and Social Justice – Connected, automated and shared mobility solutions have the greatest potential to positively impact the lives of those living in historically underserved communities, senior citizens and the economically challenged. The absence of public transportation or personal vehicle ownership leave thousands without access to healthcare, education, and social interactions reducing their quality of life and often exacerbating economic hardships. U-M is on the forefront of transportation as an issue of social justice. How, and who, are benefiting from a shared economy – and how do we create balance?</p> <p>Moderator: Dr. Tierra Bills, University of Michigan</p> <p>Speakers: Alex Karner, Assistant Professor and Hampton K. and Margret Frye Snell Endowed Chair in Transportation, University of Texas at Austin Chris Borroni-Bird, Founder, Afreecar LLC Richard Ezike, New Mobility and Equity Fellow, Union of Concerned Scientists James Fishelson, Mobility Research Supervisor, Ford Motor Company</p>
12:00 – 1:00	Lunch
1:00 – 2:00	<p>Research Topic 2A: Improving the Operational Efficiency of a Major-Minor Intersection in Mixed Traffic Flow with Connected Vehicles – This project explores a potential application of the connected vehicle technology to improve the efficiency at an intersection of major-minor streets. When connected vehicles are mixed with conventional vehicles, speed adjustment by connected vehicles may be able to create adequate gaps in the traffic stream to allow minor street vehicles to enter the intersection without the need for a dedicated timing phase to improve signal operation. In the 1st part of the project, gap characteristics were analyzed and simulation models built for</p>

simple cases. In this presentation we will discuss our continued effort that includes additional modeling analyses for more complex cases, successful trail test of the control logic with integrated system hardware and software, and site survey and preparation for the field test.

Dr. Ping Yi, University of Akron

Research Topic 2B: Time Resolved Roadway Resistance Study for Connected Vehicles – Despite the advancement in CAV technologies in recent years, there is still a significant need for studying the active safety features of vehicles and their interactions with the pavement. Factors affecting emergency braking and rolling resistance, such as tire-surface friction, braking system, and environmental conditions, vary from one situation to another; therefore, the conventional estimation method based on predefined parameters cannot sufficiently support the data need of the advanced safety features. The presentation discusses a time-resolved braking distance estimation concept to explore the impact of pavement surface, roadway slope, tire condition, and vehicle braking system as the conditions change. It was found that calculating braking distance based on generated driving power and active driving-resistance forces may help increase the data accuracy while reducing the data needs to improve vehicle safety.

Dr. Ethan Shajiei and Dr. Ping Yi, University of Akron

Panel 2: Federal Research on Automated Vehicles – Cooperative automation allows automated vehicles to communicate with other vehicles and the infrastructure to coordinate movements and increase efficiency and safety. The U.S. Department of Transportation is conducting research to measure the benefits of augmenting automated vehicle capabilities with connected vehicle technologies to enable cooperative automation.

Moderator: Kevin Dopart, Program Manager for Connected Vehicle Safety and Automation, U.S. Department of Transportation

	<p>Speakers: Taylor Lochrane, FHWA, U.S. DOT Rachel James, FHWA, U.S. DOT Roy Goudy, Nissan Kevin Dopart, ITS JPO, U.S. DOT for Gene McHale, FHWA</p>
<p>2:00 — 3:00</p>	<p>Research Topic 3: Incorporating Air Pollution Information into CAV systems – Preliminary efforts on incorporating air pollution data obtained from traffic congested areas along the freeways will be presented. Our plans to develop a system to obtain this data from the traffic counts based on the passage of trucks and cars using pollutants that would fall under NAAQS and greenhouse gases will be discussed. Ideas on how this data may be used in CAV systems to alert vehicles approaching congested areas and to seek alternative routes will be presented and feedback solicited from the consortium. Dr. Ramanitharan Kandiah and Dr. Krishna Kumar Nedunuri, Central State University</p> <p>Panel 3: Your Turn to Drive – Human Factors Issues During Transition from Automatic to Manual Vehicle Control – This panel will present a scenario where an automated vehicle system encounters a situation it can’t handle and makes a request for the human operator to take control. Panelists will examine issues concerning system design, driver-vehicle interface design, regulatory and testing issues, and forensic investigation topics.</p> <p>Moderator: Dr. Susan Chrysler, Senior Researcher, Texas A&M Transportation Institute – click here for Susan’s presentation</p> <p>Speakers: John Campbell, Senior Managing Scientist at Exponent John Lenneman, Collaborative Safety Research Center, Toyota Dr. Shan Bao, Associate Research Scientist, University of Michigan Transportation Research Institute Chris Monk, Division Chief of Human Factors Research, NHTSA</p>
<p>3:00 — 3:30</p>	<p>Wrap-Up</p>