Join leading US researchers at the University of Michigan for a four-day immersion in connected and automated vehicles. You’ll learn about key topics, technologies, and challenges for this emerging industry, as well as the solutions and standards being developed right here in Ann Arbor and around the world.

Learn more and register: isd.engin.umich.edu/cav
Program Details
Two courses are offered per year.

**MONDAY**

**Big Picture: Trends, Opportunities, and Challenges**
- Societal trends
- Safety, mobility, and energy/environment
- Early success stories
- Known challenges

**Past and Present Research, Demonstration, and Deployment**
- EU programs and key lessons learned
- Japan/Asia programs and key lessons learned
- US programs and key lessons learned

**Connected Vehicle Technology**
- Overview, objectives, and how they complement vehicle-based sensors (radar, lidar, etc.)
- Technologies
  - Vehicle-based CV devices
  - Infrastructure-based CV devices
  - Vehicle-to-Vehicle applications (V2V)
  - Vehicle-to-Infrastructure applications (V2I)
  - Infrastructure-to-Infrastructure applications (I2I)
  - Vehicle-to-Everything Else (V2X)
- Deployments of Connected Vehicle Technology

**TUESDAY**

**Connected Vehicle Data Standards**
- SAE J2735
- IEEE 1609
- ASTM E2213-03
- CVRIA

**Connected Infrastructure**
- Fundamentals
- Data standards
- Hands-on exercise
- Simulation

**WEDNESDAY**

**Cybersecurity and Privacy of CAV**
- Introduction to cryptography, data security, and privacy
- Cybersecurity standards: secure communication protocols, secure development, secure platforms
- Related activities in the US and EU
- Secure vehicle-to-vehicle safety application communication
- Secure vehicle-to-infrastructure applications communication
- Security credential management system
- Automotive security applications
- Secure automotive electronics architectures

**THURSDAY**

**Automated Vehicle Technology**
- Why automated driving?
- UM’s Mobility Transformation Center
- Case study: Next generation vehicle project with Ford Motor Company
- Mapping & localization primer
- Critical challenges ahead
- Overview of Human Factors Considerations
- Testing & Evaluation, Laws & Regulations

**Simulation Tools**
- Carsim (MSC speaker), Prescan (TASS speaker)
- POLARIS and Vissim

**Summary and Conclusion**

Space is limited to 33 people per offering, so register today!

World-Class U-M Faculty + Researchers

**Henry Liu**
Professor of Civil and Environmental Engineering,
University of Michigan Transportation Research Institute

**Huei Peng**
Professor of Mechanical Engineering,
Director, Mcity

**James Sayer**
Director,
University of Michigan Transportation Research Institute

**André Weimerskirch**
VP Cyber Security,
Lear Corporation

Learn more

Our CAV program faculty are at the forefront of connected and automated vehicle research and testing. Learn more about their work at [isd.engin.umich.edu/cav](isd.engin.umich.edu/cav)

[View dates at: isd.engin.umich.edu/cav](isd.engin.umich.edu/cav)
Program Overview

**MONDAY**

Big Picture: Trends, Opportunities, and Challenges
- Societal trends
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Past and Present Research, Demonstration, and Deployment Activities in EU, Japan, and US
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- Japan/Asia programs and key lessons learned
- US programs and key lessons learned

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**TUESDAY**

Connected Vehicle Data Standards
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- CVRIA

Connected Infrastructure:
- Fundamentals
- Data standards
- Hands-on exercise
- Simulation

Traffic Control with Connected Vehicles
- Adaptive traffic signal control
- Traffic signal priority
- Ramp metering control
- Mobile accessible pedestrian signal system

**WEDNESDAY**

Cybersecurity and Privacy of CAV
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Mcity Tour

**THURSDAY**

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Summary and Conclusion

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Program Details

Who Should Attend
This course is ideal for engineers, managers, and thought leaders interested in understanding the technologies, challenges, and current development efforts in connected and automated vehicles.

Register Today!
Visit our program web page at isd.engin.umich.edu/cav, send an email to isd-answers@umich.edu, or call (734) 647-7200.

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Exclusive Mcity Tour: One of Many Course Highlights

Course participants will have the opportunity to tour the Mcity Test Facility, the first purpose-built proving ground for testing CAV technologies in simulated urban and suburban driving environments.

The grounds include roadways featuring intersections, traffic signs and signals, sidewalks, simulated buildings, streetlights, and obstacles such as construction barriers.

Learning Objectives

• Hear from leading US researchers on the current V2X standards and technologies with a focus on safety and traffic control applications using dedicated short-range communication (DSRC)
• Learn about the scope and major findings from recent connected and automated vehicle research and development projects in the EU and US
• Understand the key cybersecurity and privacy issues and solutions under development
• Gain insight into both full-automated and partial-automated vehicle technologies and challenges, including their human factor issues and testing/evaluations
• Learn about several simulations tools used in connected and automated vehicle development
Connected and Automated Vehicles

The Course at the Epicenter of Connected Vehicle Research and Development

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The University of Michigan’s College of Engineering was founded in 1853. Today, Michigan Engineering and its academic departments rank in the top ten in their respective areas (U.S. News and World Report). The faculty’s ongoing research and industry consultation in engineering contribute to Michigan’s strength and impact on professional development. Michigan Engineering spends over $250 million on research annually, placing it in the forefront of collegiate engineering research in the U.S.

Integrative Systems + Design (ISD), a division of Michigan Engineering, offers credit courses to students on campus and at locations around the world. Recognized as a global leader in online education in addition to offering on-campus programs, ISD provides lifelong learning to technical professionals, and has served more than 100,000 students with intensive short courses, conferences, professional certifications, and advanced degree and certification programs; offered online, on campus and on site.

ISD responds to the needs of industry, healthcare, government, the military, and non-profit organizations with specialized education programs.

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