

JSPS-UMKC Workshop: Convergence of Physical and Digital Transportation Infrastructure: Research Progress and Challenges

Time: September 13, 2024; 9:00 am ~ 5:00 pm, CTS

Venue: Toyota Room (FH 531), Flarsheim Hall

Address: University of Missouri - Kansas City, Volker Campus, 5000 Holmes St., Kansas City, MO 64110

Sponsor: JSPS (Japan Society for the Promotion of Science) Washington Office

Supported by:

- School of Science and Engineering, UMKC
- University of Missouri System faculty and researchers affiliated with Missouri Center for Transportation Innovation (MCTI)
- Environmentally Responsible Transportation Center for Communities of Concern (ERTC³)

Workshop Introduction

Transportation infrastructure systems, including highways, railways, bridges, and roads, are pivotal in supporting socio-economic activities. In urban and rural areas, they interact with other civil infrastructure systems (e.g., power and utilities), vehicles, and communities. As the complexity of design, construction, maintenance, and hazard mitigation escalates, leveraging modern digital technologies becomes essential. This workshop proposes to explore the integration of physical and digital infrastructure, focusing on automation and efficiency enhancements to address the multi-dimensional challenges of modern infrastructure systems. The proposed seminar activities include:

- JSPS Information Session: JSPS staff will present JSPS programs and opportunities, and Dr. Chen will share his experience.
- Keynote Speech: Insights from leading experts in systems engineering and digital technology.
- Technical Sessions: Methodologies and engineering solutions engaging with themes of complexity, automation, and environmental responsibility, and presenting current research and advancements in integrating physical and digital infrastructures.

With the Information Session and the Technical Sessions, this workshop aims to foster a deeper understanding of the convergence between physical and digital infrastructures. It seeks to highlight innovative practices, identify common challenges, and pave the way for collaborative research initiatives. Participants will gain insights into adopting new technologies responsibly, ensuring sustainable and efficient transportation systems for the future.

Agenda

Morning Sessions, September 13 (moderator: ZhiQiang Chen)

8:00 AM ~ 9:00 AM	Breakfast
9:00 AM ~ 9:05 AM	Message from Prof. Keven Truman, Dean of the School of Science and Engineering, UMKC
9:05 AM ~ 10:00 AM	JSPS Information Session
10:00 AM ~ 10:20 AM	Q & A about JSPS program. Dr. ZhiQiang Chen's experience with JSPS Visiting Professorship
10:20 AM ~ 10:45 AM	Social hour and coffee break
10:45 ~ 11:30 AM	Keynote presentation: <i>Advanced Structural Maintenance and resilience by Digital Transformation</i> Professor Dang, JI, Saitama University, Japan
11:30 AM ~ 12:15 PM	Keynote presentation: <i>Secure Connected Autonomous Vehicles for Safety in Smart Transportation System; online</i> Professor Sanjay Madria Missouri University of Science and Technology (Senior JSPS Scholar)
12:15 PM ~ 13:30 PM	Lunch and UMKC Innovation Studio Tour

Afternoon Sessions, September 13 (moderator: ZhiQiang Chen)

1:30 PM ~ 2:15 PM	Keynote presentation: <i>A View Towards the Development and Implementation of Lower Carbon Sustainable Concrete for Infrastructure Application</i> Professor John Myers, Missouri University of Science and Technology, Director of MCTI
2:15 PM ~ 3:00 PM	Keynote presentation: <i>Overview of ERTC³ Research Activities and Findings</i> Professor Ceki Halmen, University of Missouri – Kansas City, Director of ERTC ³
3:00 PM ~ 3:10 PM	Coffee break
3:15 PM ~ 3:45 PM	Technical talk: <i>Understanding Environmental Impact of Transportation Systems Through Causal AI; online</i> Professor Xinghui Zhao, Washing State University
3:45 PM ~ 4:15 PM	Technical talk: <i>Advances in riverbed roughness quantification in large sand-bed rivers: Implications for navigation and flooding predictions</i> Professor Micah Wyssmann, University of Missouri – Kansas City
4:15 PM ~ 4:45 PM	Technical talk: <i>Advanced Bridge Design Review and Case Studies</i> Professor Thiagarajan Ganesh, University of Missouri – Kansas City
4:45 PM ~ 5:15 PM	Technical talk: <i>Smart Air Quality Monitoring in Urban Space</i> Professor Md Yusuf Uddin, University of Missouri – Kansas City
5:15 PM ~ 5:30 PM	Summary remark, Dr. ZhiQiang Chen; Group photo; Workshop adjourned
	Reception
6:00 PM ~ 8:30 PM	Venue to be determined
