

Title: Integrating Artificial Intelligence and Geospatial Intelligence: Innovative Methods and Applications in Human Mobility Modeling

Format: Half-day workshop

Organizers:

- **Xishun Liao**, Civil & Environmental Engineering Dept, University of California, Los Angeles, CA 90095, USA, xishunliao@ucla.edu, +1 (301) 742-5348
- **Yifan Liu**, Civil & Environmental Engineering Dept, University of California, Los Angeles, CA 90095, USA, bmmliu@ucla.edu, +1 (530) 220-3004
- **Haoxuan Ma**, Civil & Environmental Engineering Dept, University of California, Los Angeles, CA 90095, USA, haoxuanma@g.ucla.edu, +1 (585) 451-5170
- **Yuan Liao**, Department of Applied Mathematics and Computer Science, Technical University of Denmark, DK-2800 Kgs. Lyngby, Denmark, yuan.liao@chalmers.se
- **Shangqing Cao**, Department of Civil and Environmental Engineering, University of California at Berkeley, Berkeley, CA 94720, USA, caoalbert@berkeley.edu
- **Brian Yueshuai He**, Civil and Environmental Engineering Department, University of Louisville, Louisville, Kentucky, 40208, USA, yueshuai.he@louisville.edu
- **Chris Stanford**, Novateur Research Solutions, Ashburn, VA 20147, USA, cstanford@novateur.ai
- **Marta Gonzalez**, Civil & Environmental Engineering Department, University of California at Berkeley, Berkeley, CA 94720, USA, martag@berkeley.edu, +1 (857) 928-4546
- **Jiaqi Ma**, Civil & Environmental Engineering Dept, University of California Los Angeles, CA 90095, USA, jiaqima@ucla.edu, +1 (336) 831-7437

Abstract:

This half-day workshop aims to bring together researchers and practitioners to advance the modeling, mining, and simulation of human mobility for intelligent transportation systems and urban analytics. As the Internet of Things and smart city infrastructure produce massive, multi-modal mobility datasets, there is both an opportunity and a responsibility: to build scalable, transferable, and privacy-aware models that capture the dynamics of human movement across time, space, and social interaction.

We will explore AI-empowered and data-driven methods for modeling human mobility and travel behavior, focusing on how mobility behaviors influence and be influenced by transportation systems. This workshop will examine techniques spanning different levels of resolution—from coarse-grained trip and flow modeling to fine-grained activity chains, trajectories, and agent interactions—supporting diverse applications in planning and operations, such as demand forecasting, policy evaluation, infrastructure planning, anomaly detection, and traffic simulation.

This workshop connects the AI, transportation, and geospatial communities to accelerate the development of actionable tools for understanding and simulating human mobility at scale. It invites contributions that address the challenges and opportunities in data fusion, behavioral modeling, real-time analytics, and system-level decision support.

Topics of interest include:

- Mobility pattern recognition and travel behavior modeling
- Cross-domain multi-modal mobility data fusion
- Scalable mobility data mining and enrichment
- Modeling and synthesizing normal and atypical mobility
- Transportation-focused applications of human mobility modeling, including simulation, policy evaluation, and system optimization

- LLMs and foundation models for mobility analysis

List of keywords:

Human mobility modeling; Smart city mobility analytics; Travel behavior analytics; Mobility data mining; AI for transportation

Tentative workshop session program including:

- **Modeling Urban Mobility Dynamics: Data-Driven Approaches for Intelligent Transportation Systems**
 - Dr. Meead Saberi (confirmed), Associate Professor, University of New South Wales
- **Signals in the Noise: Defining and Detecting Mobility Anomalies at Scale**
 - Dr. Khurram Hassan-Shafique (confirmed), President, Novateur Research Solutions
- **Context-aware Trajectory Mining**
 - Dr. Yaoyi Chiang (confirmed), Associate Professor, University of Minnesota
- **Networks, Places, and People: A Computational Lens on Urban Mobility Resilience**
 - Dr. Ryan Wang (confirmed), Associate Professor, Northeastern University

Anticipated Timeline:

Time	Activity / Topic
08:30 – 08:40	Welcome and Introduction
08:40 – 9:20	Talk 1
09:20 – 10:00	Talk 2
10:00 – 10:10	Lighting Talk 1
10:10 – 10:20	Lighting Talk 2
10:20 – 10:50	Refreshments Break
10:50 – 11:30	Talk 3
11:30 – 12:10	Talk 4
12:10 – 12:20	Lighting Talk 3
12:20 – 12:30	Lighting Talk 4

The relevant ITSS Technical Committee: Mobility Pattern Recognition and Travel Behavior Modeling