



Department of Data Science

香港城市大學
City University of Hong Kong

DS SEMINAR

Human-Dynamics Informed Electrification of Mobility Systems

Date: 6 December 2024 (Friday)

Time: 9:30am - 10:30am



Seminar Link: <https://cityu.zoom.us/j/87116247353>

ABSTRACT

In response to climate change, decarbonization technologies are being rapidly deployed, with the electrification of transportation emerging as one of the most promising solutions. The growing integration of electric vehicles (EVs) into power systems demonstrates how modern energy systems, as large-scale physical infrastructures, embedded in a complex communication web whose dynamics are driven by human behavior. Planning for the transition to sustainable energy systems requires a deep understanding of human behavior. To this end, my work aims to facilitate this transition by leveraging insights from large-scale human activity data. This seminar will start with exploring how social networks influence EV adoption forecasts by comparing benchmark adoption models across different spatial scales. Next, It will demonstrate the integration of large-scale human activity data with empirical charging preferences to estimate charging demand of potential EV adopters, followed by the discussion that highlights the effectiveness of mobility-constrained personalized charging recommendations in aligning charging demand with power grid capabilities. While coordinated EV charging has significant potential to alleviate grid pressure, achieving this requires a carefully designed market to incentivize users to follow recommendations. To address this challenge, I will present a cluster-based, appliance-level demand response program aimed at encouraging users to shift their electricity consumption away from peak grid hours. At the end of the talk, I will present a research agenda built from my prior work to investigate how emerging technologies and physical assets could be utilized to facilitate the electrification of human mobility.



Ms. Jiaman WU

GUEST SPEAKER'S PROFILE

Jiaman WU is currently pursuing a Ph.D. in Systems Engineering in the Department of Civil and Environmental Engineering at UC Berkeley. Before that, she received her bachelor's degree from the School of Remote Sensing and Information Engineering at Wuhan University and her master's degree from the Institute for Interdisciplinary Information Sciences at Tsinghua University. Her research focuses on modeling human dynamics and leveraging these insights to facilitate urban system operations. Her work has been published in leading journals, such as Applied Energy, Cell Reports Sustainability, IEEE Transactions on Smart Grid and IEEE Systems Journal, as well as top-tier conferences, such as ACM e-Energy, ACM SIGSPATIAL and IEEE SmartGridComm.

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All are welcome