CIVIL AND ENVIRONMENTAL ENGINEERING DEPARTMENT SEMINAR

DR. CHAO FAN
Assistant Professor
Civil and Environmental Engineering and Earth Sciences
Clemson University

Date: Friday, October 27ʰ, 2023
Time: 12:45pm – 2:00pm EST
Location: Bingham Bldg., Room 140
Zoom Link: [Here](#)

Towards Equitable Climate Change Adaptation with City Digital Twins

Abstract: Climate change is characterized by increasingly extreme weather patterns, such as prolonged heatwaves, frequent wildfires, hurricanes, and floods. These shifts necessitate urban adaptation efforts by understanding and strengthening the resilience of existing infrastructure, planning and designing new infrastructure, and prioritizing social and environmental equity. The success of such an adaptation, however, relies on solutions capable of addressing the complex and non-linear interactions at the nexus of human, infrastructure, and the natural environment. While significant research has delved into individual urban systems, a gap persists in our understanding to transform the theories and methods for city planning and infrastructure design with the integration of disparate systems, compounded by the effects of climate change. This presentation emphasizes human-centric approaches and the transformative potential of emerging technologies in creating city digital twins to foster equitable climate change adaptation. It will specifically discuss efforts to harness rapidly growing techniques of AI and data science to model and understand infrastructure inequality, urban-scale spillover effects, and the causation of disasters on human well-being in the context of a changing climate.

Bio: Dr. Chao Fan is an Assistant Professor of Civil and Environmental Engineering and Earth Sciences at Clemson University. He received a PhD degree in Civil Engineering from Texas A&M University in 2020, and an MS degree from UC Davis in 2017. His research delves into the confluence of artificial intelligence (AI) and climate change adaptation in urban contexts, shedding light on how AI and digital twin technologies can transform our understanding of the complex interactions among human, infrastructure, and the natural environment. He is directing the infrastructure, AI and urban nexus (FAN) lab at Clemson University. He has authored 34 (17 first author) papers in peer-reviewed journals such as npj Urban Sustainability, Computer-aided Civil and Infrastructure Engineering, International Journal of Information Management, and IEEE Transactions, including 2 ESI highly cited papers. His work has appeared in more than 20 international news media such as ASCE Civil Engineering Magazine and Phys.org. He serves as an Associate Editor for Cell Heliyon, an Editorial Board Member for Humanities and Social Sciences Communications (Nature Portfolio), a reviewer of 49 peer-reviewed journals, and a chair/member of program committees on 11 ASCE/ACM/IEEE/AAAI conferences.