SEMINAR

Defining Urban Engineering to Help Design Sustainable and Resilient Cities

Monday, April 8, 2019, 3pm to 4pm

ASU Tempe Campus, CAVC 559

Since the Neolithic era, infrastructure has been the physical backbone of civilization. Nowadays, our society would not be able to thrive without roads, water pipes, sewers, power lines, telecommunication cables, and all other infrastructure systems. In the future, infrastructure systems will have to change and become smarter, more sustainable, and more resilient. This problem calls for Urban Engineering as a radically new way to view and design urban infrastructure; as Einstein famously said: "We cannot solve problems by using the same thinking we used when we created them." At the Complex and Sustainable Urban Networks (CSUN) Laboratory, we leverage complexity science, data science, and urban metabolism to gain insights into how cities are designed and how they are used. In this seminar, I will first talk about our vision at CSUN to better integrate and decentralize urban infrastructure systems. Second, I will explain who we use machine learning to infer how people use the services provided by urban infrastructure systems, particularly by looking at water consumption and travel mode choice modeling. Third, I will outline a conceptual model that we can use to design more integrated and decentralized urban infrastructure systems, as well as highlight some of the future research directions of the laboratory.

Bio: Sybil Derrible is an Associate Professor of Sustainable Infrastructure Systems in Civil and Materials Engineering, a Research Associate Professor at the Institute for Environmental Science and Policy, and the Director of the Complex and Sustainable Urban Networks (CSUN) Laboratory at the University of Illinois at Chicago. His research is at the nexus of urban metabolism, infrastructure planning, complexity science, and data science to redefine how cities are planned, designed, engineering, and operated for smart, sustainable, and resilient urban systems. He received a US National Science Foundation CAREER Award for his work, and he obtained his PhD from the University of Toronto.