

# School of Sustainable Engineering and the Built Environment

## SSEBE Seminar



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11:00am – 12:00pm

College Avenue Commons (CAVC) 335

## Personalization of Future Mobility Systems

**Abstract:** In the past few years, we have been experiencing the rapid growth of new mobility solutions. These changes have been fueled by a myriad of innovations in technology, such as automated vehicles, as well as in business models, such as shared-ride services. These emerging mobility solutions are often hailed as sustainable and efficient solutions to serving the heterogeneous needs of mobility consumers – but how do system operators achieve these multiple goals? The availability of high-resolution consumer mobility behavior data collected from smartphones and other GPS-equipped devices enables researchers to design operational management strategies for future mobility systems that are personalized while also serving various system-wide objectives.

This presentation focuses on the design of future mobility systems through the personalized menu optimization model. The model builds upon individual consumers' choice behavior to generate a personalized menu for app-based mobility solutions. It integrates behavioral modeling of consumer mobility choice with optimization objectives such as system revenue and ridership. Individual choice behavior is modeled through logit mixture and the parameters are estimated with a Hierarchical Bayes (HB) procedure. We implement this model in smart mobility systems including Tripod, a sustainable travel planner which incentivizes travelers to choose green transportation modes such as public transit through token allocation. We evaluate the benefits of personalization through a case study based on real travel survey data from the city of Boston. In addition, we extend the model to a dynamic setting and illustrate the benefits of the proposed dynamic solution with numerical experiments.

**Bio:** Xiang (Ben) Song obtained his Ph.D. in Transportation at Massachusetts Institute of Technology in 2018, where he was advised by Dr. Moshe Ben-Akiva. He also obtained a Master of Science in Transportation from MIT in 2013, and a Master of Science in Management Research from MIT Sloan School of Management in 2016. He now works as a data scientist in Boston. His research focuses on designing and analyzing the smart mobility systems of the future that 1) are personalized and efficient, 2) are facilitated by artificial intelligence and Big Data, and 3) satisfy sustainability and safety needs. He is also interested in Bayesian econometrics, choice-based optimization, data science, and Markov decision process.