Inferring Parking Occupancy and Parking Search from Parking Payment Data

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The excessive search for parking, known as cruising, generates pollution and congestion. Consequently, cities are looking for policy levers to reduce the damage caused by cruising. An important piece of this problem is accurately measuring the number of cars searching for parking, which is difficult and requires expensive sensing technologies. In recent joint work with Robert Hampshire (University of Michigan), we develop an approach that eliminates the need for sensing technology. Our approach uses parking meter payment transactions to estimate parking availability and the number of cars searching for parking. The estimation scheme uses a *particle Markov chain Monte Carlo* method with a stochastic queueing model. We show that our approach generates asymptotically unbiased estimates of the parking occupancy and underlying model parameters such as arrival rates, average parking time, and the payment compliance rate. We validate the performance of this approach using parking meter data from a large scale parking experiment called SF *park*, and compare our parking occupancy estimates against the ground truth measured by parking sensors.

Biography

Daniel Jordon is a Data Scientist at SeatGeek Inc., a live event ticketing startup based in New York City. His work deals with data pipeline engineering and model development related to pricing and marketing. He received his PhD in Mathematics from Drexel University in 2013, with a focus on functional analysis and partial differential equations. He subsequently did post-doctoral fellowships at Carnegie Mellon University and the University of Michigan doing research in applied probability and transportation. He has broad research interests in mathematics and computer science.