Modeling Social Information Learning among Taxi Drivers

Siyuan LIU, Carnegie Mellon University
siyuan@cmu.edu
Ramayya KRISHNAN, Carnegie Mellon University
rk2x@andrew.cmu.edu
Emma BRUNSKILL, Carnegie Mellon University
ebrun@cs.cmu.edu
Lionel M. NI, Hong Kong University of Science and Technology
ni@cse.ust.hk

17th Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD’13), Gold Coast, Australia, April 2013

LARC Accepted Conference Papers: http://smu.edu.sg/centres/larc/conference-papers/
When a taxi driver of an unoccupied taxi is seeking passengers on a road unknown to him or her in a large city, what should the driver do? Alternatives include cruising around the road or waiting for a time period at the roadside in the hopes of finding a passenger or just leaving for another road enroute to a destination he knows (e.g., hotel taxi rank)? This is an interesting problem that arises everyday in many cities worldwide. There could be different answers to the question posed above, but one fundamental problem is how the driver learns about the likelihood of finding passengers on a road that is new to him (as in he has not picked up or dropped off passengers there before). Our observation from large scale taxi drivers behavior data is that a driver not only learns from his own experience but through interactions with other drivers. In this paper, we first formally define this problem as Socialized Information Learning (SIL), second we propose a framework including a series of models to study how a taxi driver gathers and learns information in an uncertain environment through the use of his social network. Finally, the large scale real life data and empirical experiments confirm that our models are much more effective, efficient and scalable than prior work on this problem.