IS Department Seminar

Semi-Supervised Learning in Inferring Mobile Device Locations
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DATE: Wednesday October 30, 2013
COFFEE: 2:15
TIME: 2:30-4:00
LOCATION: GITC 1403

ABSTRACT
With the development of mobility technology, location information has become collectible by various positioning technologies. Different positioning technologies have their advantages and limitations. In this paper, we propose semi-supervised learning in inferring low-accuracy location data density from high-accuracy location data density. We focus on the enormous amount of low-accuracy Cell Tower Triangulation (CTT) calculated mobile device location data, and the small amount of high-accuracy Assisted Global Positioning System (AGPS) pinpointed location data. The CTT and AGPS mobile device location data is collected for each cell tower that serves the devices, then the actual distribution is learned from both CTT and AGPS data by semi-supervised learning and the likelihood for low-accuracy CTT location can be used as an accuracy indicator. The proposed method takes the advantage of the existing extensively collected location data, and augments it by a machine learning algorithm, which complements the downside of one technology with the other technology. This big data approach improves the location accuracy statistically without the added complexity and cost of upgrading or replacing mobile networks or devices. And also the proposed method focuses on the location density alignment, which avoids tracking individual user devices and preserves user privacy.

BIO
Rong Duan received her B.S. degree in Computer Science from Qingdao University, M.S. and Ph.D. degrees in Computer Science and Computer Engineering from Stevens Institute of Technology. She is currently the Principle Member of Technical Staff at the AT&T Labs, Middletown, NJ and adjunct professor at Stevens Institute of Technology. Has been working in AT&T Labs for more than 18 years, Rong has extensive experience on statistical learning, data mining, predictive modeling and data analysis for business data. And she is specialized in Business Intelligence, Marketing Decision Analysis, Operation management and Customer Information Management. Her research interests include statistical learning theory and methods for Information System and Operation Management, Data Integration and Data Quality Assessment. Her publications are in the areas of time series modeling, spatial-temporal even detection, spatial-temporal risk assessment and data quality control.
Rong served as Secretary/Treasurer, Vice Chair and Chair for the Data Mining Section of INFORMS (Institute of Operations Research and Management Sciences) in 2006-2008, 2008-2009, 2009-2010 respectively. She was the cluster co-chair for INFORMS Annual Conference Data Mining Section in 2008 and INFORMS International Beijing in 2012. Rong also served as a program co-chair for the 1st and the 2nd International Symposium on System Informatics and Engineering.

Topic: IS Seminar - Rong Duan
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