Inference of Social Relationships from Location Data
(Keynote)

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Abstract—For decades, social scientists have been studying peoples social behaviors by utilizing sparse datasets obtained by observations and surveys. These studies received a major boost in the past decade due to the availability of web data (e.g., social networks, blogs and review web sites). However, due to the nature of the utilized dataset, these studies were confined to behaviors that were observed mostly in the virtual world. Differing from all the earlier work, here, we aim to study social behaviors by observing peoples behaviors in the real world. This is now possible due to the availability of large high-resolution spatiotemporal location data collected by GPS-enabled mobile devices through mobile apps (Googles Map/Navigation/Search/Chrome, Facebook, Foursquare, WhatsApp, Twitter) or through online services, such as geo-tagged contents (tweets from Twitter, pictures from Instagram, Flickr or Google+ Photo), etc.

In particular, we focus on inferring pair-wise strength as the strength of social connections between a pair of users by utilizing the available high-fidelity location data representing peoples movements.

Finally, we argue that due to the sensitivity of location data and user privacy concerns, these inferences cannot be largely carried out on individually contributed data without privacy guarantees. Hence, we discuss open problems in protecting individuals location information while enabling these inference analyses.

BIBLIOGRAPHICAL SKETCH

Cyrus Shahabi is a Professor of Computer Science, Electrical Engineering and Spatial Sciences, and the chair of the Computer Science Department. He is also the Director of the Data Science Institute (DSI) and the Informatics Program at USC’s Viterbi School of Engineering. He was the CTO and co-founder of a USC spin-off, Geosemble Technologies, which was acquired in July 2012. Since then, he founded another company, ClearPath (recently rebranded as TallyGo), focusing on predictive path-planning for car navigation systems. He received his B.S. in Computer Engineering from Sharif University of Technology in 1989 and then his M.S. and Ph.D. Degrees in Computer Science from the University of Southern California in May 1993 and August 1996, respectively. He authored two books and more than three hundred research papers in databases, GIS and multimedia with more than 12 US Patents.

Dr. Shahabi was an Associate Editor of IEEE Transactions on Parallel and Distributed Systems (TPDS) from 2004 to 2009, IEEE Transactions on Knowledge and Data Engineering (TKDE) from 2010-2013 and VLDB Journal from 2009-2015. He is currently the chair of ACM SIGSPATIAL for the 2017-2020 term and also on the editorial board of the ACM Transactions on Spatial Algorithms and Systems (TSAS) and ACM Computers in Entertainment. He is the founding chair of IEEE NetDB workshop and also the general co-chair of SSTD15, ACM GIS 2007, 2008 and 2009. He chaired the nomination committee of ACM SIGSPATIAL for the 2011-2014 terms. In the past, he has been PC co-chair of several conferences such as APWeb+WAIM2017, BigComp2016, MDM2016, DASFAA 2015, IEEE MDM 2013 and IEEE BigData 2013, and regularly serves on the program committee of major conferences such as VLDB, SIGMOD, IEEE ICDE, ACM SIGKDD, IEEE ICDM, and ACM Multimedia.

Dr. Shahabi is a fellow of IEEE, and a recipient of the ACM Distinguished Scientist award in 2009, the 2003 U.S. Presidential Early Career Awards for Scientists and Engineers (PECASE), the NSF CAREER award in 2002, and the 2001 Okawa Foundation Research Grant for Information and Telecommunications. He was also a recipient of the US Vietnam Education Foundation (VEF) faculty fellowship award in 2011 and 2012, an organizer of the 2011 National Academy of Engineering Japan-America Frontiers of Engineering program, an invited speaker in the 2010 National Academy of Engineering Japan-America Frontiers of Engineering program, and a participant in the 2005 National Academy of Engineering Frontiers of Engineering program.