

# GeoSoCa: Exploiting Geographical, Social and Categorical Correlations for Point-of-Interest Recommendations

**SPEAKER** Mr ZHANG Jia-DongPhD Student  
Department of Computer Science  
City University of Hong Kong  
Hong Kong**DATE** 7 August 2015 (Friday)**TIME** 1:00 pm - 1:30 pm**VENUE** CS Seminar Room, Y6405, 6th Floor  
Yellow Zone, Academic 1  
City University of Hong Kong  
83 Tat Chee Avenue  
Kowloon Tong

## ABSTRACT

Recommending users with their preferred points-of-interest (POIs), e.g., museums and restaurants, has become an important feature for location-based social networks (LBSNs), which benefits people to explore new places and businesses to discover potential customers. However, because users only check in a few POIs in an LBSN, the user-POI check-in interaction is highly sparse, which renders a big challenge for POI recommendations. To tackle this challenge, in this study we propose a new POI recommendation approach called GeoSoCa through exploiting geographical correlations, social correlations and categorical correlations among users and POIs. The geographical, social and categorical correlations can be learned from the historical check-in data of users on POIs and utilized to predict the relevance score of a user to an unvisited POI so as to make recommendations for users. First, in GeoSoCa we propose a kernel estimation method with an adaptive bandwidth to determine a personalized check-in distribution of POIs for each user that naturally models the geographical correlations between POIs. Then, GeoSoCa aggregates the check-in frequency or rating of a user's friends on a POI and models the social check-in frequency or rating as a power-law distribution to employ the social correlations between users. Further, GeoSoCa applies the bias of a user on a POI category to weigh the popularity of a POI in the corresponding category and models the weighed popularity as a power-law distribution to leverage the categorical correlations between POIs. Finally, we conduct a comprehensive performance evaluation for GeoSoCa using two large-scale real-world check-in data sets collected from Foursquare and Yelp. Experimental results show that GeoSoCa achieves significantly superior recommendation quality compared to other state-of-the-art POI recommendation techniques.

This paper will be presented at The 38th ACM International Conference on Research and Development in Information Retrieval (ACM SIGIR 2015), Santiago, Chile, August 9-13, 2015 (<http://www.sigir2015.org/>). The ACM SIGIR Conference focuses on research and development in information retrieval. It is the major international forum for the presentation of new research and the demonstration of new systems and techniques in the broad field of information retrieval.

Supervisor: Dr CHOW Chi Yin Ted

Research Interests: Mobile data analytics, big data analytics, urban computing, geographic information systems, spatial and spatiotemporal databases, data privacy, machine learning, mobile computing, and web &amp; mobile apps.

**All are welcome!**

In case of questions, please contact Dr Chow Chi Yin Ted at Tel: 3442 8679, E-mail: [chiychow@cityu.edu.hk](mailto:chiychow@cityu.edu.hk), or visit the CS Departmental Seminar Web at <http://www.cs.cityu.edu.hk/>.