Computer Science
Seminar

Privacy-Preserving Inference of Social Relationships from Location Data

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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 two specific social measures: 1) pair-wise strength – the strength of social connections between a pair of users, and 2) pair-wise influence - the amount of influence that an individual exerts on another, 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.

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