

Social Networking and Mobility: A Data Management Perspective

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I. SEMINAR OUTLINE

Figures 1 and 2 give the seminar outline, which consists of two main parts. The seminar presents the state-of-the-art research, systems, and applications that combine both social networking and mobility.

A. PART I: Social Networking and Mobility: Why, What ?

The outline of the first part is given in Figure 1. We start by giving a quick overview of social networking services (e.g., Facebook, Twitter), their evolution, and how they impact the society [1], [2], [3], [4]. Similarly, we explain, through examples and case studies, how the widespread of mobile devices changed the computing paradigm in a way that impacted our daily life. We then illustrate how the marriage of both social networking and mobility has led to the rise of location-based social networking systems. We highlight several attempts to combine social networking and mobility, and then explain the functionality of current location-based social networking systems, and we use Foursquare as a case study. Therefore, we explain the richness of data generated by merging both social networking and mobility [5], [6], [7], [8]: (1) *Social Networking data*: represents the friendship between different users as well as all sorts of social interactions between users. (2) *Spatial/Spatio-Temporal data*: represents the users geo-locations, venues (e.g., restaurant) geo-locations and information about users visiting different places at different times. (3) *Opinions data*: represents how much a user likes the places she visits (e.g., Alice visited restaurant A and gave it a rating of five). We then illustrate how different mixes of this data trilogy are leveraged to explore new trends and build novel applications [6], [7], [9], [10].

B. PART II: Combining Geo and Social: Different Perspectives

In the second part (outline in Figure 2), we present the state-of-the-art research that lies within the intersection of both social networking and mobility, from the following perspectives: (1) *GeoSocial Queries*: That incorporates both the geo-location and the social awareness in answering queries [11], [12], [13], [14]. We present recent studies that show how both spatial and social aspects can be combined to enhance the search quality. (2) *GeoSocial Recommendation*: We present recent studies which show that geo-location matters in recommender systems [15], [16], and we manifest several techniques to incorporate the spatial/spatio-temporal information and users

PART I : Social Networking and Mobility: Why, What ?

- Social Networking and Mobility: Overview (5 minutes)
 - The Effect of Social Networking on People's Life.
 - Mobility Changed the Computing Paradigm.
 - Combining Social Networking and Mobility.
- The Rise of Location-based Social Networking (5 minutes)
 - The functionality of current LBSN systems.
 - Is it all about the Check-In functionality?
- Location-based Social Networking: Data Trilogy (10 minutes)
 - Social networking data
 - Spatial/Spatio-Temporal Data
 - Users Opinions Data
 - Data trilogy to enrich the user experience.
- Combining Social Networking and Mobility: Perspectives (10 minutes)
 - GeoSocial Search and Query Processing.
 - GeoSocial Recommendation.
 - GeoSocial Data Analytics.
 - GeoSocial Media Visualization.
 - GeoSocial Crowd-sourcing.

Fig. 1. Tutorial Outline: PART I (30 minutes).

opinions data side by side in traditional recommender systems [9], [17], [18], [19]. We also highlight the research works that leverage GeoSocial data points and trajectories for travel and itinerary recommendations [20], [21]. (3) *GeoSocial Analytics*: We give an overview of computational techniques that analyze GeoSocial data [22], [23], [24], [25] to learn more about human behavior, the societal and economical consequences of such analysis [26], [27]. (4) *GeoSocial Visualization*: We motivate the need for visualizing GeoSocial Media (e.g., Geo-Tagged Tweets, Geo-Tagged Videos) and present the state-of-the-art GeoSocial visualization techniques [28], [29]. (5) *GeoSocial Crowdsourcing*: We give an overview of the Volunteered Geographic Information (VGI) area and survey the recent papers that address the Crowdsourcing topic from a geographic perspective [30], [31]. For all aforementioned topics, we present results from recent research work, case studies from hot mobile applications, and the anatomy of built systems. Then, we highlight the main risks that result from combining social networking and mobility (e.g., privacy). Finally, we introduce possible research directions.

II. TARGET AUDIENCE

The seminar is targeted at mobile data and social networking researchers, developers, and enthusiasts. Attending the seminar does not require any prior knowledge as it starts by giving a quick overview of both the social networking and mobility concepts. This seminar lasts for 90 minutes and the detailed timing is given in Figures 1 and 2. By attending the seminar,

PART II : Combining Geo & Social: Different Perspectives

- GeoSocial Search and Query Processing (10 minutes)
 - Microblog Search Queries.
 - GeoSocial News Feed Queries.
- GeoSocial Recommendation Services (10 minutes)
 - Location and Recommendation.
 - Location-Aware Recommender Systems.
- GeoSocial Data Analytics (10 minutes)
 - Analyzing Human Behavior
 - Predicting GeoSocial Norms/Trends.
- GeoSocial Media Visualization (10 minutes)
 - GeoSocial Visualization Techniques.
 - Case Studies.
- GeoSocial Crowd-sourcing (10 minutes)
 - Volunteered Geographic Information (VGI).
 - Humans as Sensors.
- GeoSocial: Risks and Threats (5 minutes)
 - User Geo-Location is sensitive Information.
 - Protect User Privacy and Ensure Quality.
- Summary and Open Research Directions (5 minutes)

Fig. 2. Tutorial Outline: PART II (60 minutes).

the audience are expected to get more familiar with the state-of-the-art research that lies in the intersection of both social networking and mobility.

III. BIOGRAPHY

Mohamed Sarwat is a doctoral candidate at the department of Computer Science and Engineering, University of Minnesota. He obtained his Bachelor's degree in computer engineering from Cairo University in 2007 and his Master's degree in computer science from University of Minnesota in 2011. His research interest lies in the broad area of data and information management systems. Mohamed has been awarded the University of Minnesota Doctoral Dissertation Fellowship in 2012. His research work has been recognized by the Best Research Paper Award in SSTD 2011.

Mohamed F. Mokbel is an associate professor in the Department of Computer Science and Engineering, University of Minnesota. His main research interests focus on advancing the state of the art in the design and implementation of database engines to cope with the requirements of emerging applications (e.g., location-based applications and sensor networks). His research work has been recognized by three best paper awards at IEEE MASS 2008, MDM 2009, and SSTD 2011. Mohamed is a recipient of the NSF CAREER award 2010. He has actively participated in several program committees for major conferences including ICDE, SIGMOD, VLDB, SSTD, and ACM GIS. He is/was a program co-chair for ACM GIS 2008, 2009, and 2010. Mohamed is an ACM and IEEE member and a founding member of ACM SIGSPATIAL.

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