The Preface of the 4th International Workshop on Location-Based Social Networks

Yu Zheng
Microsoft Research Asia
Beijing, China
yuzheng@microsoft.com

Jason Hong
Carnegie Mellon University
Pittsburgh, Pennsylvania, USA
jasonh@cs.cmu.edu

ABSTRACT
We briefly introduce the 4th international workshop on location-based social networks (LBSN 2012), describing its objective, importance, and results.

Author Keywords
Location-based social networks, LBSN 2012, UbiComp 2012.

AIMS AND SCOPE
Social networks have been prevalent on the Internet and become a hot research topic attracting many professionals from a variety of fields. The advances in location-acquisition and mobile communication technologies empower people to use location data with existing online social networks in a variety of ways. For example, users can upload location-tagged photos to a social networking service such as Flickr, comment on an event at the exact place where the event is happening (for instance, in Twitter), share their present location on a website (such as Foursquare) for organizing a group activity in the real world, record travel routes with GPS trajectories to share travel experiences in an online community (for example GeoLife [1][2]), or log jogging and bicycle trails for sports analysis and experience sharing (as in Bikely).

The dimension of location helps bridge the gap between the physical world and online social networking services [3]. For example, a user with a mobile phone can leave her comments with respect to a restaurant in an online social site (after finishing dinner) so that the people from her social structure can reference her comments when they later visit the restaurant. In this example, users create their own location-related stories in the physical world and browse other people's information as well. An online social site becomes a platform for facilitating the sharing of people's experiences.

UbiComp' 12, Sep 5 – Sep 8, 2012, Pittsburgh, USA.

Furthermore, people in an existing social network can expand their social structure with the new interdependency derived from their locations [4][5][6]. As location is one of the most important components of user context, extensive knowledge about an individual's interests, behaviors, and relationships with others can be learned from her locations [7][8][9]. For instance, people who enjoy the same restaurant can connect with each other. Individuals constantly hiking the same mountain can be put in contact with each other to share their travel experiences [4]. Sometimes, two individuals who do not share the same absolute location can still be linked as long as their locations are indicative of a similar interest, such as beaches or lakes [6].

These kinds of location-embedded and location-driven social structures are known as location-based social networks, formally defined as follows [10][11]:

A location-based social network (LBSN) does not only mean adding a location to an existing social network so that people in the social structure can share location-embedded information, but also consists of the new social structure made up of individuals connected by the interdependency derived from their locations in the physical world as well as their location-tagged media content, such as photos, video, and texts. Here, the physical location consists of the instant location of an individual at a given timestamp and the location history that an individual has accumulated in a certain period. Further, the interdependency includes not only that two persons co-occur in the same physical location or share similar location histories but also the knowledge, e.g., common interests, behavior, and activities, inferred from an individual's location (history) and location-tagged data.

In a location-based social network, people can not only track and share the location-related information of an individual via either mobile devices or desktop computers [8], but also leverage collaborative social knowledge learned from user-generated and location-related content, such as GPS trajectories and geo-tagged photos. One example is determining this summer's most popular restaurant by mining people's geo-tagged comments. Another example could be identifying the most popular travel routes in a city based on a large number of users'

geo-tagged photos [19]. The city dynamics can also be modeled with the social media generated by a large number of users [20][21]. Consequently, LBSNs enable many novel applications that change the way we live, such as travel planning [12][13], location recommendations [5][13][14] [15], friend suggestion [5][9], activity suggestion [16][17] [18], event detection, and community discovery, while offering many new research opportunities, including link prediction, human mobility modeling, and user activity recognition , computer human interaction, and privacy [22].

TOPICS OF INTEREST

Topics of interest include but not limited to the following:

Understanding users in LBSNs

- User preference modeling
- User mobility modeling and analysis
- Real-world user activity sensing and recognition
- User similarity computing based on locations
- Link prediction and social tiers inference
- Friend recommendations and community discovery
- Expert discovery and influential person identification
- User intension understanding

Understanding locations in LBSNs

- Hot spots, significant places, and interesting locations detection
- Generic or personalized location recommendations
- Popular travel routes discovery from social media
- Trip planning and itinerary suggestion for users
- Location annotation and semantic meaning identification
- Location prediction and location privacy
- Anomaly detection and event discovery from social media
- Trajectory data mining in LBSNs

Information sharing in LBSNs

- Location and location-related data sharing
- Location and location-tagged media visualization
- Human-computer interaction in LBSNs
- Information retrieval in LBSNs.

Results

LBSN 2012 was held in Sept. 8 2012, in conjunction with UbiComp 2012 at Pittsburg, USA. Over 40 people participated in LBSN 2012. We received 19 submissions from 10 countries and regions. Each submission was assigned to three PCs for a peer review. As a result, we accepted 6 full oral papers and 9 short-presentation papers. The acceptance rate of full paper is about 31.6%. All the accepted papers will be included in ACM Digital Library, having the same length of up to 8 pages. A few quality full presentation papers will be invited to the special issue on urban computing in ACM Transaction on Intelligent Systems and Technology. The accepted papers were organized into four sessions: Privacy and Location Prediction, Topics and Events in LBSNs, Understanding user behavior in LBSNs, and Recommendations in LBSNs.

Organizers

Dr. **Yu Zheng** is a researcher from Microsoft Research Asia. He is an senior member of both IEEE and ACM. His research interests include trajectory data mining, location-based social networks, and urban computing. He has published over 70 referred papers at international conferences and journals, such as SIGMOD, KDD, AAAI, ICDE, WWW, Ubicomp, IEEE TKDE, and ACM TWEB. These papers have been featured by top-tier presses like MIT Technology Review multiple times. He has received 3 best paper awards respectively from UIC'10, ACM SIGSPATIAL GIS'11, and ADMA'11, as well as 1 best paper nominee from Ubicomp'11. He has written two book chapters and edited one book as an editor-in-chief. He has been invited to over 30 prestigious international conferences as a chair or program committee member, including ICDE, KDD, Ubicomp, IJCAI, ACM SIGSIAPTAL, ACM MM, PAKDD, and SSTD, etc. He is also an editorial board of 4 international journals and is a guest editor of ACM Transaction on Intelligent Systems and Technology. So far, he has supervised over 30 visiting Ph.D. students from around the world. He has received 3 technical transfer awards from Microsoft and 20 granted/filed patents. In 2008, he was recognized as the Microsoft Golden Star. He joined MSRA in July 2006 right after received his Ph.D. degree in communication & information systems from Southwest Jiaotong University.
Homepage: http://research.microsoft.com/en-us/people/yuzheng/

Jason Hong is an associate professor in the Human Computer Interaction Institute, part of the School of Computer Science at Carnegie Mellon University. He works in the areas of ubiquitous computing and usable privacy and security. He is also an author of the book The Design of Sites, a popular book on web design using web design patterns. Jason is also a co-founder of Wombat Security Technologies, which focuses on the human side of computer security. Jason received his PhD from Berkeley and his undergraduate degrees from Georgia Institute of Technology. Jason is also an Alfred P. Sloan Research Fellow.
Homepage: http://www.cs.cmu.edu/~jasonh/

REFERENCES

1. Yu Zheng, Yukun Chen, Xing Xie, Wei-Ying Ma. GeoLife2.0: A Location-Based Social Networking Service. In proceedings of International Conference on Mobile Data Management, IEEE press, 2009.

2. Yu Zheng, Xing Xie, and Wei-Ying Ma, GeoLife: A Collaborative Social Networking Service among User, location and trajectory, in IEEE Data(base) Engineering Bulletin, IEEE, June 2010

3. Justin Cranshaw, Eran Toch, Jason Hong, Niki Kittur, Norman Sadeh. Bridging the Gap Between Physical Location and Online Social Networks. In Proceedings of The Twelfth International Conference on Ubiquitous Computing (Ubicomp 2010).

4. Quannan Li, Yu Zheng, Xing Xie, and Wei-Ying Ma, Mining user similarity based on location history, in ACM SIGSPATIAL GIS 2008, ACM, 2008

5. Yu Zheng, Lizhu Zhang, Zhengxin Ma, Xing Xie, and Wei-Ying Ma, Recommending friends and locations based on individual location history, in ACM Transaction on the Web, ACM, 2011.

6. Xiangye Xiao, Yu Zheng, Qiong Luo, Xing Xie. Inferring Social Ties between Users with Human Location History. Journal of Ambient Intelligence and Humanized Computing.

7. Yu Zheng, Quannan Li, Yukun Chen, Xing Xie, Wei-Ying Ma. Understanding Mobility Based on GPS Data. In Proceedings of UbiComp'08, ACM Press.

8. Yang Ye, Yu Zheng, Yukun Chen, Jianhua Feng, Xing Xie. Mining Individual Life Pattern Based on Location History. In proceedings of MDM'09. IEEE, 1-10.

9. Jason Wiese, Patrick Kelley, Lorrie Cranor, Laura Dabbish, Jason Hong, John Zimmerman. Are you close with me? Are you nearby? Investigating social groups, closeness, and willingness to share. In Proceedings of The Thirteenth International Conference on Ubiquitous Computing (Ubicomp 2011)

10. Yu Zheng. Location-based social networks: users. In Computing with Spatial Trajectories. Yu Zheng and Xiaofang Zhou, Eds. Springer 2011. ISBN: 978-1-4614-1628-9.

11. Yu Zheng. Tutorial on Location-Based Social Networks. WWW2012.

12. Hyoseok Yoon, Yu Zheng, Xing Xie, and Woontack Woo, Social Itinerary Recommendation from User-generated Digital Trails, in Personal and Ubiquitous Computing, Springer Verlag, 10 May 2011

13. Yu Zheng, Xing Xie, and Wei-Ying Ma, Mining Interesting Locations and Travel Sequences From GPS Trajectories, in WWW 2009, ACM, 2009

14. Yu Zheng, Xing Xie. Learning Location Correlation from GPS trajectories. In proceedings of the International Conference on Mobile Data Management 2010, IEEE press. USA.

15. Yu Zheng and Xing Xie, Learning travel recommendations from user-generated GPS traces, in ACM Transaction on Intelligent Systems and Technology, ACM, January 2011.

16. Vincent W. Zheng, Yu Zheng, Xing Xie, and Qiang Yang, Towards mobile intelligence: Learning from GPS history data for collaborative recommendation, Artificial Intelligence, Elsevier, April 2012.

17. Vincent Wenchen Zheng, Bin Cao, Yu Zheng, Xing Xie, and Qiang Yang, Collaborative Filtering Meets Mobile Recommendation: A User-centered Approach, in AAAI 2010, ACM. 2010

18. Vincent Wenchen Zheng, Yu Zheng, Xing Xie, and Qiang Yang, Collaborative Location and Activity Recommendations With GPS History Data, in WWW 2010, ACM, 2010

19. Ling-Yin Wei, Yu Zheng, Wen-Chih Peng, Constructing Popular Routes from Uncertain Trajectories. 18th SIGKDD conference on Knowledge Discovery and Data Mining (KDD 2012).

20. Jing Yuan, Yu Zheng, Xing Xie. Discovering regions of different functions in a city using human mobility and POIs. 18th SIGKDD conference on Knowledge Discovery and Data Mining (KDD 2012).

21. Justin Cranshaw, Raz Schwartz, Jason Hong, and Norman Sadeh. The Livehoods Project: Utilizing Social Media to Understand the Dynamics of a City. ICWSM 2012.

22. Yu Zheng, Xiaofang Zhou. Computing with Spatial Trajectories. Springer, 2011. ISBN: 978-1-4614-1628-9