PredictGIS 2017 Workshop Report
Held in conjunction with ACM SIGSPATIAL 2017

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The prediction of human and vehicle mobility in a city is becoming attracting field. This topic attracts researchers in broad field from the behavioral science, where understanding the complexity of the human mobility behavior is one of the hot topic, to industrial field, which apply the result to many beneficial applications. Recent progress to sensing human mobility via smartphones is boosting this trend. However, due to the complexity and context-dependence of human behavior and the incompleteness and noise of geospatial data collecting from various sensors, the prediction of human and vehicle mobility is still far from solved. This workshop aimed at collecting contributions on the cutting-edge studies in human mobility description, modeling, intelligent computational method which can advance the human and vehicle prediction research. Potential topics included, but were not limited to 1) The next location prediction of individual mobility, 2) The crowd or population mobility prediction, 3) Dynamics of pedestrians, 4) commute flow and migration flow, 5) Traffic congestion, road usage forecast and optimal vehicle routing, 6) Social event forecast using geospatial data, 7) Novel agent mobility simulators, and 8) Case studies of mobility estimation in academia as well as in industrial field.

The first PredictGIS workshop was held on 7th November 2017 at the ACM SIGSPATIAL conference in Los Angeles, USA. At PredictGIS 2017, there were 9 presentations, of which 6 were full papers, 1 was a vision paper, and 2 were keynote presentations. The average number of attendees were around 10 people, with a maximum of around 15 people. There were 14 people who registered for the workshop. Overall, the workshop attracted papers with various topics, methods, and datasets. The variety of papers increased the number of topics covered in the workshop, and triggered an intense discussion between attendees on the current trends, issues, and also future research opportunities related to the prediction of human mobility.

We had two keynote presentations, from both the academia and the industry. The first keynote was delivered by Takahiro Yabe from Purdue University with the title, "Prediction of mass people movement from agent model and observation data". He presented the keynote on behalf of Dr.Yoshihide Sekimoto, an Associate Professor of the University of Tokyo because he could not attend the workshop. The keynote covered various topics related to understanding and predicting the movement of individuals in the urban scale, and introduced projects using various datasets from surveys to mobile phone GPS data. The keynote included papers that were presented in past ACM conferences (Ubicomp, SIGSPATIAL) and focused on the prediction of urban mobility in disaster situations. The second keynote was presented by Kota Tsubouchi from Yahoo Japan Corporation. He talked about the works presented in ACM conferences on utilizing the massive GPS dataset collected by Yahoo Japan. He also provided us with future opportunities of combining location information with other interesting datasets collected by Yahoo Japan.

In our first presentation, Xinyi Liu from University of Wisconsin-Madison talked about the impact of MTUP to explore online trajectories for human mobility studies. She used neat visualization tools to assess the issue of time granularity when clustering trajectory data. Her presentation was followed by Joon Heo from Yonsei University. He talked about the preliminary results of his analysis of mobility data of students within the campus,

and how he could utilize it to understand and ultimately improve the quality of student life in the university.

After lunch break, Priit Jarv from Tallinn University of Technology presented his unique work on extracting mobility data from geo-tagged photos. The universality of the methods and analysis drew attention and raised some discussion within the attendees. Akihito Sudo talked about his deep neural network model for predicting the indoor crowd density. His idea was to modify the deep neural network by adding columns in the first few layers to extract important features.

In the last session, Pang Yanbo from the University of Tokyo presented his work on modeling and reproducing human daily travel behavior from GPS data using a Markov decision process approach. He utilized Yahoo Japan Corporation's GPS dataset to reconstruct the urban flow using inverse learning of the reward functions. Xiliang Liu from the Institute of Geographic Sciences and Natural Resources Research presented his work on the stepwise heterogeneous ensemble method for citywide traffic analysis. Finally, Dominik Bucher from ETH Zurich presented his vision paper on using volunteered geographic information to improve mobility prediction. His talk was perfect as our last presentation, as it lead to a very deep discussion on how the next steps of human mobility prediction should be. As a whole, this workshop had very fruitful discussions along with very interesting and cutting-edge talks from the presenters. We would like to thank the presenters and attendees of the workshop for making it a huge success, and also the organizing members of ACM SIGSPATIAL 2017 for giving us an opportunity to hold this workshop.