Introduction to this Special Issue: Urban Analytics and Mobility (Part 2)

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According to a US Census report [2], the daytime population of cities like Washington D.C. nearly doubles the nighttime population, coining the notion of "Mega Commuting". To understand, explain, and predict urban mobility, our current data-centered era provides a plethora of rich data sources. These data sources capture mobility on the road, including GPS trajectories, metro, bus and taxi origin-destination data, indoor navigation data and many more types and sources of data.

These rich data sources present challenges and opportunities to develop new spatial and spatio-temporal data management systems, as well as novel geographic information systems. Broader impacts of this research directly affect urban life, such as a reduction of the 11 billion liters of fuel wasted traffic each year in the the United States [1]. This special issue of the SIGSPATIAL Special Newsletter contains five articles which present visions, challenges, and solutions to improve transportation issues in urban environments.

1. In the first article, we hit the road: Eftelioglu surveys the challenge and future research directions of finding "avoidance patterns" using GPS trajectory data. Therefore, the challenge is to automatically identify areas of a road network that users are avoiding, for reasons such as potholes and crime,
2. the second article takes us indoors: Cheema gives an overview of challenges and opportunities using indoor location-based services towards making them as ubiquitous as their outdoor counterpart,
3. for the third article, we use peer-to-peer ride-sharing services: Tong and Zhou describe the challenge of dynamically and efficiently assigning tasks for spatial crowdsourcing platforms, such as ride-sharing services, to minimize the overhead on the road,
4. for the fourth article, we take the bus: Fei and Gkountouna propose to analyze bus data, including GPS and odometer readings (distance traveled), to find spatio-tempral patterns of congested areas. These patterns will be paramount towards future research on more efficient public transportation,
5. In the fifth and final article, we visit alternate worlds: Kim, Kavak and Crook propose urban simulation as a paradigm to generate, simulate, explain and predict urban population and mobility. They propose the challenge of creating socially plausibly simulations that capture the complexity of real-world cities, thus providing unlimited and perfect data of all aforementioned urban mobility data types.

I would like to thank the authors for their contributions, and I hope the readers will enjoy this issue and find it useful in their research work.

References

[1] D. Schrank, B. Eisele, T. Lomax, and J. Bak. Urban Mobility Scorecard. The Texas A&M Transportation Institute and INRIX, 2015.

[2] U.S. Census Bureau. U.S. Department of Commerce. Economics and Statistics Administration. Measuring America: An Overview to Commuting and Related Statistics `https://www.census.gov/content/dam/Census/data/training-workshops/recorded-webinars/commuting-nov2014.pdf`.