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DNI/NIE/Passaport	
Nom i cognoms	LIYA YANG
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Unitat estructural	Tecnología de la Arquitectura (TA),Universitat Politècnica de Catalunya
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Nowadays, the widespread utilization of intelligent mobile and located-embedded services extends the border of social network sites (SNS) to physical-spatial space. The appearance of SNS changes our daily life meanwhile promotes the shift of the research paradigm of all academic disciplines. The data generated from SNS is named location-based social network (LBSN) data.

As to urban studies, LBSN data provides a promising opportunity to understand the quotidian life and cities, and thus it brings a profound impact on both urban theories and empirical studies, such as the urban spatiotemporal analysis and urban sentiment analysis. However, despite the opportunities that LBSN data provides, some challenges and limitations also associate with related researches of urban studies. Who are using LBSN applications? How many degrees could social media data represent the actual situation of the physical city? What is the relation between LBSN data and urban issues?

Therefore, taking advantage of previous researches, this dissertation seeks to explore the applications and limitations of location-based social media data for urban spatiotemporal analysis based on a comprehensive summation of current works and three empirical analyses based on different sources of LBSN data in different cities. The ultimate purpose of the dissertation is expected to gain new knowledge that could help future urban studies and urban planning.

The dissertation reviews the historical evolution of LBSN data and delimitates the definition of LBSN data. Meanwhile, it tries to construct the theoretic connection between LBSN data and human spatiotemporal behaviors. A snowballing literature study is adopted in the literature review of the dissertation. It summarizes urban applications and limitations leveraging LBSN data and compares their results for increasing knowledge that is currently lacking. Three empirical studies that utilize different LBSN dataset to conduct innovative researches regarding the urban structure, functional relations, and urban sentiments. Some popular algorithms of spatiotemporal analysis are involved in these studies.

In the Sina Weibo data case, the spatiotemporal variation of Weibo activities reflected how people occupied the urban space dynamically in Beijing, China. The Foursquare case study calculated and confirmed the functional relationship between places in Barcelona, Spain. The Twitter data project investigates the relationship between the urban environment and public sentiments. The results confirm some phenomena that were also observed by other research. Furthermore, they also drill deeper into the relationship between LBSN data and the urban space.

The result argues the irreplaceable position of LBSN data in urban studies and states the potentials of LBSN data from the perspective of scientific urban planning. This dissertation reveals the potentials and limitations of LBSN data at the level of non-government research. LBSN data as a data bridge, connect social activities with geo-space. In the future, cooperating with a keen understanding of society and other datasets, LBSN data can create more possibilities for urban daily life and urban studies.

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