A New Hint to Transportation-Analysis of the NYC Bike Share System

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LITERATURE SURVEY

TITLE	AUTHOR	ALGORITHM	ADVANTAGES	DISADVANTAGES
What do trip data reveal about bike-sharing system users?	Elias Willberg, Maria Salonen, Tuuli Toivonen	ANOVA technique with Tukey's pairwise post-hoc tests.	This study shows that most trips are generated by the users, which points in the same direction with recent findings, although less strongly. This indicates broader participation of various groups with varying cycling capabilities. High bike-sharing systems (BSS) use in Helsinki is nevertheless largely generated by a limited group of people, who are disproportionately younger adults and male. The most active user quintile in this study had distinctive temporal and spatial patterns, implying habitual use.	BSS trip databases are increasingly available, which is not typical of many other cycling data sources. A significant proportion of users did not provide gender information. No data was available to analyse user's economic or social background and their potential effects on BSS usage patterns. Additional socio-economic variables in trip datasets, such as education, economic background and ethnicity would help to deepen understanding on the inclusiveness of BSSs beyond age, gender and home location.

Multi-source Data Analysis for Bike Sharing	Nguyen The Hoai Thu, Le Trung Thanh	Machine Learning Regression models 1.Weighted K-Nearest-Neighbor (SWK) 2.Artificial Neural Network (ANN)	SWK-based regression models learn the weights of several meteorological factors and bike usage and use the correlation between consecutive time slots to predict the bike pick-up demand. The ANN is trained by using historical trip records of Bike sharing systems, meteorological data, and Bike trip records. Bike sharing systems help to reduce the traffic congestion, air Pollution and noise.	Bike sharing systems face many problems, one of which is the availability imbalance. Due to the fact that movements of customers are highly dynamic, the bike usage is non-stationary, changing markedly with time and location. Therefore, some stations may be short of available bikes for rent while some are full and do not have enough docks for returned bikes
A long-term perspective on the COVID-19: The bike sharing system resilience under the epidemic environment	Hui Bi, Zhirui Ye, Yuhan Zhang, and He Zhud	Complex network analysis, Network dissimilarity: Kullback-Leibler divergence (KL-divergence), Multiple regression model of sojourn time	This provides a comparative analysis of bike sharing spatial-temporal mobility patterns and connectivity of the bike sharing usage network, before and during the public health crisis with a macroscopic perspective. Also, a multivariate investigation of user and trip characteristics on BSS is conducted to uncover the difference in the frequency of outdoor and sojourn time between various user communities. This study also finds evidence of the significant gender, age and cycling pattern gaps in response to potential risk.	Due to the impact of the outbreak, BSS registered severe ridership drops, yet it quickly recovered to the pre-pandemic levels within months. The decline of bike sharing usage was felt throughout all the areas during the outbreak. The less densely connected network of bike sharing usage has also resulted in a reduction in users' destination heterogeneity.

Bicycle sharing systems demand	Inês Frade, Anabela Ribeiro	Latent Demand Score Method	The methodology provides a coefficient of potential demand for bicycle trips throughout a transportation network (in each arc of the network), based on the influence of generator/attractors points in the city on the number of bicycle trips for all road segments. One of the advantages of this model are that it acts as a geographic information system.	The trips estimated are not directional (the method considers the total number of the trips that were generated and attracted), meaning that the method compromises an Origin-Destiny evaluation.

Estimating Bike Availability from NYC Bike Share Data	Clif Kranish	Using Pandas to restructure trip records from Citi Bike to estimate the number of bikes available at a station throughout the day.	This study shows how to determine the availability of bikes (and docks). Citi Bike provides a real-time feed of station status with the number of available bikes and docks as a web service. Using the station status information would require writing a program that would periodically query the feed and save the information. However, Citi Bike does provide monthly trip data files with a record for each trip that includes the start and end time and station. It's possible to use this data to estimate bike availability.	The number of bikes in the station at the beginning of the month is unknown. It doesn't take into account rebalancing, bikes removed for maintenance or those added to the system.