Lit Review

Yan Pan, Ray Chen Zheng, Jiaxi Zhang, Xin Yao,

Predicting bike sharing demand using recurrent neural networks,

Procedia Computer Science,

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https://doi.org/10.1016/j.procs.2019.01.217.

(<http://www.sciencedirect.com/science/article/pii/S1877050919302364>)

* Variables: historical data, weather data, and time data
* Method: find two communities with the most demand for shared bikes
* Model: trained a deep LSTM model with two layers to predict bike renting and returning (recurrent neural network)
* Evaluate: Root Mean Squared Error

Malani, J., Neha Sinha, N. Prasad and V. Lokesh. “Forecasting Bike Sharing Demand.” .

<https://www.semanticscholar.org/paper/Forecasting-Bike-Sharing-Demand-Malani-Sinha/1b67300836eb4ee3532f41bab6b9ed5a77676f87#paper-header>

Table

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Chart, histogram

Description automatically generated

Bike Share Usage Prediction in London

Ford Rylander Bo Peng Jeff Wheeler

<http://cs229.stanford.edu/proj2014/Ford%20Rylander,%20Bo%20Peng,%20Jeff%20Wheeler,%20Bike%20Share%20Usage%20Prediction%20in%20London.pdf>

Features:

**d1, d2, d3, d7**  
dn is the number of rides during the same hour n days prior.

**weather** is a binary representation of the weather events from the day of x(i).

**mean temp** is the mean temperature on the day of x(i).

**weekday** is an integer representation of the day of

the week, with weekday ∈ [0, 6].

**is\_weekend** is a single bit that encodes whether x(i) is

on a weekend or not.

**h1,... ,h5 hn** is the demand n hours prior to the hour of x(i).

Method:

2nd-order polynomial model that is fit after clustering the training set using the geographical coordinates of the start stations.

Weixing Ford, Jaimie W. Lien, Vladimir V. Mazalov & Jie Zheng (2019) Riding to Wall Street: determinants of commute time using Citi Bike, International Journal of Logistics Research and Applications, 22:5, 473-490, DOI: 10.1080/13675567.2019.1584164 (Abstract only)

trip data from Citi Bike, restricted analysis to morning rides into the Wall Street area

Weather-related factors have a small impact on biking commute time compared to other factors.

UNDERSTANDING USAGE OF PUBLIC BIKE SHARING SYSTEM : CITI BIKE AS AN EXAMPLE: Tang, Yawei

Weather Data Source:

National Oceanic and Atmospheric Administration (NOAA) -> GHCN (Global Historical Climatology Network) variables include: temperature daily maximum/minimum, temperature

at observation time, precipitation, snowfall, snow depth, evaporation, wind movement,

wind maximums, soil temperature, cloudiness,

<http://www.velomondial.net/velomondiall2000/pdf/bach.pdf>

### [PDF] [Urban Design as an helping hand to promote Bike-use](http://www.velomondial.net/velomondiall2000/pdf/bach.pdf)

B Bach, N Pressman - velomondial.net

Recommendations to improve thermal comfort for bike riders

Cold Climate

Shelter from wind should be achieved by the use of planting (vegetation, hedgerows, walls, fences, coniferous trees e.g. pine), in order to reduce wind chill. Overshadowing by buildings should be minimized wherever possible and orientation for maximum reception of solar radiation should be accepted development policy. Where ramps exist they should be heated, provided the lengths of the ramps are not excessive. Cycle-paths and areas of intense pedestrian use should not be located close to the corners of high-rise buildings where wind turbulence has a tendency to reduce the comfort level.

Hot Climate

cooling possibilities exist by utilizing heat-reflecting materials combined with overhead shelter systems covering primary pedestrian paths and cycling areas. The basic principle is to avoid the absorption of heat and to provide maximum areas of shade.  
Additionally, the provision of green areas (with a low ratio of paved surfaces) induces a cooling effect - since through the process of ‘evapotranspiration’ these have a lower capacity for heat storage (6).