

Yanyan Xu Postdoctoral Associate

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Research Interests

Human Mobility / Urban Computing / Big Data Mining / Smart Transportation / Energy & Air Quality

Appointments

Postdoctoral Associate, Human Mobility and Networks Lab., Department of City and Regional Planning, and Institute of Transportation Studies, University of California, Berkeley, CA. December 2018 - present.

Supervisor: Prof. Marta C. González, <http://humnetlab.berkeley.edu>

Postdoctoral Associate, Human Mobility and Networks Lab., Department of Civil and Environmental Engineering, Massachusetts Institute of Technology, MA. September 2015 - November 2018.

Supervisor: Prof. Marta C. González

Visiting Postdoctoral Scholar, Department of City and Regional Planning, University of California, Berkeley, CA. November 2017 - November 2018.

Guest Postdoctoral Fellow, Energy Analysis and Environmental Impacts Division, Lawrence Berkeley National Laboratory, Berkeley, CA. December 2017 - November 2018.

Education

Ph.D. Pattern Recognition and Intelligent Systems, Shanghai Jiao Tong University, Shanghai, P.R. China, September 2010 - June 2015

Supervisor: Prof. Yuncai Liu

Dissertation: Short-Term Traffic Flow Prediction Based on Spatio-Temporal Correlation

Visiting Student. The *.enpeda..* Project, Department of Computer Science, University of Auckland, New Zealand, March 2009 - June 2009.

Supervisor: Prof. Reinhard Klette, <https://cerv.aut.ac.nz/>

M.S. Signal and Information Processing, School of Information Science and Engineering, Shandong University, Jinan, P.R. China, September 2007 - June 2010.

Supervisor: Prof. Hui Chen

B.S. Electronic Information Engineering, School of Information Science and Engineering, Shandong University, Jinan, P.R. China, September 2003 - June 2007.

Academic Activities

Projects:

DeepAir: Deep Learning and Satellite Imaginary to Estimate Air Quality Impact at Scale, UC Berkeley-LBNL, April 2019 - present

Understanding routing behavior using LBS data, MIT-Cintra, September 2018 - present

Impacts on Energy Consumption of Autonomous Vehicles in the Bay Area, Berkeley Deep Drive, Jan. 2018 - present

Understanding Distribution of Facilities in Diverse Cities, MIT-QCRI, April 2016 - April 2018

Coupling Electric Vehicle Charging with Urban Mobility, MIT, September 2016 - August 2017

Revealing the Impacts of Traffic on Air Quality using Big Data, MIT, May 2016 - August 2017

Traffic Demand Management during Mega Events via the Use of Information Technologies, MIT-Ford, September 2015 - August 2016

Urban Traffic Flow Modeling and Prediction, Shanghai Jiao Tong University, September 2010 - June 2014.

Urban Area Traffic Index Modeling and Prediction, Shanghai Jiao Tong University, June 2011 - July 2013.

Invited Talks:

“Coupling Electric Vehicle Charging with Urban Mobility using Mobile Phone Data”, Department of Bid Data, Fudan University, December 2019

“Tackle Urban Challenges using Mobile Phone Data”, Department of Computer Science, Shanghai Jiao Tong University, June 2019

“Big Data Driven Human Mobility for Smart Transportation”, Department of Transportation, Shipping and Logistics, Shanghai Jiao Tong University, August 2018

“Big Data Driven Human Mobility for Smart Transportation”, School of Transportation Engineering, Tongji University, August 2018

“Coupling Electric Vehicle Charging with Urban Mobility”, Sustainable Transportation Initiative, Lawrence Berkeley National Laboratory, May 2018

“Coupling Electric Vehicle Charging with Urban Mobility”, Department of Civil and Environmental Engineering, Stanford University, May 2018

“Data Science to Tackle Urban Mobility Challenges”, Artificial Intelligence for Economic Development Conference hosted by CEGA and World Bank, March 2018, San Francisco, CA (Keynote speaker)

“Big Data Driven Human Mobility to Tackle Urban Challenges”, Shandong University, October 2017, Qingdao

“Coupling Electric Vehicle Charging with Urban Mobility”, Tongji University, May 2017, Shanghai

“Travel Demand Management with Big Data during Mega Events”, Qatar Computing Research Institute (QCRI), February 2017, Doha, Qatar

“Big Data to Tackle Transportation Challenges”, Hisense, September 2016, Qingdao

Services:

Associate editor, Journal of Information and Communication Convergence Engineering

Workshop Chair, The Pacific-Rim Symp. on Image and Video Tech. (PSIVT) 2019, Sydney

Workshop Chair, The 15th Intern. Symp. on Pervasive Systems, Algorithms and Networks (I-SPAN) 2018

Serve as reviewer for

Nature Energy

Nature Sustainability
 IEEE Internet of Things Journal
 IEEE Transactions on Mobile Computing
 IEEE Transactions on Knowledge and Data Engineering
 IEEE Transactions on Intelligent Transportation Systems
 IEEE Transactions on Vehicular Technology
 IEEE Intelligent Transportation Systems Magazine
 IEEE Access
 Data Mining and Knowledge Discovery
 Transportation Research Part C: Emerging Technologies
 Computers, Environment and Urban Systems
 Transportmetrica A: Transport Science
 Transportation Research Board Annual Meeting (ADC20)

Selected Publications * indicates corresponding author

In preparation & under review

1. **Yanyan Xu**, Riccardo Di Clemente, Marta C. González, “Understanding Route Choice Behavior with Location-Based Services Data”, under review in *EPJ Data Science*.
2. Di Zhu, Rui Song, Hui Chen*, **Yanyan Xu***, Reinhard Klette, “Moment-based Multi-lane Detection and Tracking”, under review in *Image and Vision Computing*.
3. Marco De Nadaia, **Yanyan Xu**, Emmanuel Letouzé, Marta C. González, and Bruno Lepri, “Socio-Economic, Environmental, and Mobility Conditions Associated with Crime: A Tale of Multiple Cities”, under review in *Scientific Reports*.

Journal Articles

1. **Yanyan Xu**, Luis E. Olmos, Sofiane Abbar, Marta C. González, “Deconstructing laws of accessibility and facility distribution in cities”, accepted in *Science Advances*.
2. Mahendra Paipuri, **Yanyan Xu**, Marta C. González, Ludovic Leclercq, “Estimating MFDs, trip lengths and path flow distributions in a multi-region setting using mobile phone data”, accepted in *Transportation Research Part C: Emerging Technologies*.
3. Bin Wang, Cungang Wang*, Qian Zhang, Ying Su, Yang Wang, **Yanyan Xu***, “Cross-Lingual Image Caption Generation based on Visual Attention Model”, *IEEE Access* 8 (2020): 104543-104554.
4. **Yanyan Xu**, Shan Jiang, Ruiqi Li, Jiang Zhang, Jinhua Zhao, Sofiane Abbar, Marta C. Gonzalez, “Unraveling Environmental Justice in Ambient PM_{2.5} Exposure in Beijing: A Big Data Approach”, *Computers, Environment and Urban Systems*, 75, 12-21, 2019
5. **Yanyan Xu**, Serdar Colak, Emre C. Kara, Scott J. Moura and Marta C. González, “Planning for Electric Vehicle Needs by Coupling Charging Profiles with Urban Mobility”, *Nature Energy*, 3, 484-493, 2018.
6. Senyan Yang, Jianping Wu, Tao Yang, **Yanyan Xu**, “Revealing Heterogeneous Spatiotemporal Traffic Flow Patterns of Urban Road Network via Tensor Decomposition-based Clustering Approach”, *Physica A: Statistical Mechanics and its Applications*, 2019

7. Chang Yuan, Hui Chen*, Ju Liu, Di Zhu, **Yanyan Xu***, "Robust Lane Detection for Complicated Road Environment Based on Normal Map", *IEEE Access*, 6, 49679-49689, 2018
8. Dongxue Han, Hui Chen*, Changhe Tu, **Yanyan Xu***, "View Synthesis using Foreground Object Extraction for Disparity Control and Image Inpainting", *Journal of Visual Communication and Image Representation*, 56, 287-295, 2018
9. Xiaoqing Dai, Lijun Sun, **Yanyan Xu***, "Short-term Origin-Destination based Metro Flow Prediction with Probabilistic Model Selection Approach". *Journal of Advanced Transportation*, 2018.
10. **Yanyan Xu**, and Marta C. González, "Collective Benefits in Traffic during Mega Events via the Use of Information Technologies," *J. Roy. Soc. Interface*, 14:20161041, 2017.
11. Jinzhao Yuan, Hui Chen*, Bin Zhao, **Yanyan Xu***, "Estimation of Vehicle Pose and Position with Monocular Camera at Urban Road Intersections", *Journal of Computer Science and Technology*, 32(6), 2017.
12. Rui Song, Hui Chen*, Zhiguang Xiao, **Yanyan Xu***, Reinhard Klette, "Lane Detection Algorithm based on Geometric Moment Sampling," *Science in China Series F-Information Sciences*, 47(1), 2017.
13. **Yanyan Xu**, Hui Chen, Qing-Jie Kong, Xi Zhai, and Yuncai Liu, "Urban Traffic Flow Prediction: A Spatio-Temporal Variable Selection Based Approach," *Journal of Advanced Transportation*, vol. 50, pp. 489-506, 2016.
14. **Yanyan Xu**, Qing-Jie Kong, Reinhard Klette, and Yuncai Liu, "Accurate and Interpretable Bayesian MARS for Traffic Flow Prediction," *IEEE Transactions on Intelligent Transportation Systems*, vol. 15, no. 6, pp. 2457-2469, 2014.
15. Qing-Jie Kong, **Yanyan Xu**, Shu Lin, Ding Wen, Fenghua Zhu and Yuncai Liu, "UTN-model based Traffic Flow Prediction for Parallel-Transportation Management Systems," *IEEE Transactions on Intelligent Transportation Systems*, vol. 14, no. 3, pp. 1541-1547, 2013.

Proceedings

1. Wuwei Lan, **Yanyan Xu***, Bin Zhao, "Travel Time Estimation without Road Networks: An Urban Morphological Layout Representation Approach", *IJCAI*, 2019. (Co-first author, corresponding author)
2. **Yanyan Xu**, Ruiqi Li, Shan Jiang, Jiang Zhang, and Marta C. González, "Clearer Skies in Beijing – Revealing the Impacts of Traffic on the Modeling of Air Quality," *Proc. of the 96rd Annual Meeting of the Transportation Research Board, Washington, D.C., 2017.*
3. **Yanyan Xu**, Bin Wang, Qing-Jie Kong, Yuncai Liu and Fei-Yue Wang, "Spatio-temporal Variable Selection Based Support Vector Regression for Urban Traffic Flow Prediction," *Proc. of the 93rd Annual Meeting of the Transportation Research Board, Washington, D.C., 2014.*
4. **Yanyan Xu**, Qing-Jie Kong, and Yuncai Liu, "A Spatio-Temporal Multivariate Adaptive Regression Splines Approach for Short-Term Freeway Traffic Volume Prediction," *The 16th International IEEE Conference on Intelligent Transportation Systems, Hague, Netherlands, 2013.*
5. **Yanyan Xu**, Qing-Jie Kong, and Yuncai Liu, "Short-Term Traffic Volume Prediction Using Classification and Regression Trees," *The 2013 IEEE Intelligent Vehicles Symposium (IV'13)*, Gold Coast, Australia, 2013, pp. 493-498.
6. **Yanyan Xu**, Qing-Jie Kong, and Yuncai Liu "Comparison of Urban Traffic Prediction Methods between UTN-Based Spatial Model and Time Series Models," *The 15th International IEEE Conference on Intelligent Transportation Systems, Anchorage, AK, USA, 2012*, pp. 814-819.
7. **Yanyan Xu**, Qing-jie Kong, Shu Lin, and Yuncai Liu, "Urban Traffic Flow Prediction Based on Road Network Model," *The 9th IEEE International Conference on Networking, Sensing and Control, Beijing, China, 2012*, pp. 334-339.

8. **Yanyan Xu**, Hui Chen, Reinhard Klette, Jiaju Liu, and Tobi Vaudrey, "Belief Propagation Implementation using CUDA on an NVIDIA GTX 280," *Proceeding AI'09: The 22nd Australasian Joint Conference on Artificial Intelligence*, Melbourne, Australia. LNAI 5866, 2009, pp. 180-189.

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