Guang Wang

PERSONAL DETAILS

Address	Department of Computer Science Rutgers, The State University of New Jersey 110 Frelinghuysen Road, Piscataway New Jersey, USA, 08854
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RESEARCH INTERESTS

Big Data-Driven Cyber-Physical Systems, Ubiquitous Computing, Fairness-Aware Decision Making, Artificial Intelligence, and Human-Centered Computing

EDUCATION

Visiting Student 1.2021-Present
MIT Media Lab, USA
Working with Prof. Alex 'Sandy' Pentland and his group

Ph.D. of Computer Science 9.2017-Present
Rutgers, The State University of New Jersey, USA
GPA: 4.0/4.0 Expected Graduate Date: May 2021

Master of Traffic Information Engineering and Control 9.2014-3.2017
Beijing Jiaotong University, China *My major is ranked #1 in China*
GPA: 3.97/4.0 with **Best Master Thesis Award (1/149)**

Bachelor of Transportation Information Engineering 9.2010-7.2014
East China Jiaotong University, China
Junior-senior GPA: 3.94/4.0 Rank: 1/84

PUBLICATIONS

Summary: I have 27 papers already published/accepted, including 9 first-author papers published in top venues of computer science, i.e., 3 ACM UbiComp, 1 ACM MobiCom, 1 IEEE ICDE, 1 IEEE RTSS, 2 ACM TIST, and 1 ESWA. I also have 6 co-author papers published in top conferences of computer science, i.e., ACM MobiCom, IEEE ICDE, ACM UbiComp, WWW, AAAI, and IEEE IROS. In addition, I have over 10 papers under the submission of top venues, including ACM UbiComp, MobiCom, and WWW.

Published or Accepted Papers

[1] **Guang Wang**, Shuxin Zhong,Shuai Wang,Fei Miao, Zheng Dong, and Desheng Zhang. Data-Driven Fairness-Aware Vehicle Displacement for Large-Scale Electric Taxi Fleets. *37th IEEE International Conference on Data Engineering* ***(ICDE 2021)***, pages 1-12.

[2] **Guang Wang**, Harsh Rajkumar,Huijun Sun,Jianjun Wu,Shuai Wang, and Desheng Zhang. Understanding User Behavior in Car Sharing Services Through the Lens of Mobility: Mixing Qualitative and Quantitative Studies. *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies* ***(IMWUT/UbiComp)***, pages 1-30, 2020.

[3] **Guang Wang**, Yongfeng Zhang, Zhihan Fang, Fan Zhang,Shuai Wang,and Desheng Zhang. FairCharge: A Data-Driven Fairness-Aware Charging Recommendation System for Large-Scale Electric Taxi Fleets. *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies* ***(IMWUT/UbiComp)***, pages 1-25, 2020.

[4] **Guang Wang**, Xiuyuan Chen, Fan Zhang, Yang Wang, and Desheng Zhang. Experience: Understanding Long-Term Evolving Patterns of Shared Electric Vehicle Networks. *In Proceedings of the 25th Annual International Conference on Mobile Computing and Networking* ***(MobiCom)***, pages 1-12. ACM, 2019. Acceptance rate: 56/290 = 19%.

[5] **Guang Wang**, Wenzhong Li, Jun Zhang, Yingqiang Ge, Zuohui Fu, Fan Zhang, Yang Wang, and Desheng Zhang. sharedCharging: Data-Driven Shared Charging Scheduling for Large-Scale Heterogeneous Electric Vehicle Fleets. *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies* ***(IMWUT/UbiComp)***, pages 1-25, 2019. Acceptance rate: 23%.

[6] **Guang Wang**, Xiaoyang Xie, Fan Zhang, Yunhuai Liu, and Desheng Zhang. bCharge: Data-Driven Real-Time Charging Scheduling for Large-Scale Electric Bus Fleets. *In 39th IEEE Real-Time Systems Symposium* ***(RTSS)****, 2018*, pages 45-55. Acceptance rate: 22%.

[7] **Guang Wang**, Fan Zhang, Yang Wang, Huijun Sun, and Desheng Zhang. Understanding the Long-Term Evolution of Electric Taxi Networks: A Longitudinal Measurement Study on Mobility and Charging Patterns. *ACM Transaction on Intelligent System and Technology* ***(ACM TIST)***, pages 1-27, 2020.

[8] **Guang Wang**, Zhihan Fang, Xiaoyang Xie, Shuai Wang, Huijun Sun, Fan Zhang, Yunhuai Liu and Desheng Zhang. Pricing-Aware Real-Time Charging Scheduling and Charging Station Expansion for Large-Scale Electric Buses. *ACM Transaction on Intelligent System and Technology* ***(ACM TIST)***, pages 1-26, 2020.

[9] **Guang Wang**, Tianhua Xu, Tao Tang, Tangming Yuan, and Haifeng Wang. A Bayesian Network Model for Prediction of Weather-Related Failures in Railway Turnout Systems. *Expert Systems With Applications* ***(ESWA)***, 69:247-256, 2017.

[10] **Guang Wang** and Desheng Zhang. Poster: Understanding Long-Term Evolving Mobility and Charging Patterns of Shared EV Networks. *In Proceedings of the 25th Annual International Conference on Mobile Computing and Networking* , pages 1-3. ACM, 2019.

[11] **Guang Wang**, Fan Zhang, and Desheng Zhang. Poster Abstract: tCharge - A Fleet-Oriented Real-Time Charging Scheduling System for Electric Taxi Fleets. *SenSys '19: The 17th ACM Conference on Embedded Networked Sensor Systems (****SenSys****).* ACM, 2019.

[12] **Guang Wang**, Tianhua Xu, Haifeng Wang, and Yunhuai Zou. Adaboost and Least Square Based Failure Prediction of Railway Turnouts. *In Computational Intelligence and Design (ISCID), 2016 9th International Symposium on*, volume 1, pages 434-437. IEEE, 2016.

[13] Zhihan Fang, **Guang Wang**, Xiaoyang Xie, Fan Zhang and Desheng Zhang. Urban Map Inference by Pervasive Vehicular Sensing Systems with Complementary Mobility. *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies* ***(IMWUT/UbiComp)***, pages 1-23, 2021.

[14] Zhihan Fang, **Guang Wang**, Shuai Wang, Chaoji Zuo, Fan Zhang and Desheng Zhang. CellRep: Usage Representativeness Modeling and Correction Based on Multiple City-Scale Cellular Networks. *The Web Conference (****WWW****)*, 2020. Acceptance rate: 19%.

[15] Yu Yang, Yi Ding, Dengpan Yuan, **Guang Wang**, Xiaoyang Xie, Yunhuai Liu, Tian He, and Desheng Zhang. TransLoc: Transparent Indoor Localization with Uncertain Human Participation for Instant Delivery. *In Proceedings of the 25th Annual International Conference on Mobile Computing and Networking (**MobiCom**)*, 2020. Acceptance rate: 16%.

[16] Xiaoyang Xie, Yu Yang, Zhihan Fang, **Guang Wang**, Fan Zhang, Fan Zhang, Yunhuai Liu, and Desheng Zhang. coSense: Collaborative Urban-Scale Vehicle Sensing Based on Heterogeneous Fleets. *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (**IMWUT/UbiComp**)*, 2019. Acceptance rate: 7%.

[17] Zuohui Fu,Yikun Xian,Shijie Geng,Yingqiang Ge, Yuting Wang,Xin Dong, **Guang Wang**, Gerard de Melo. ABSent: Cross-Lingual Sentence Representation Mapping with Bidirectional GANs. ***AAAI***, 2020. Acceptance rate: 20.6%.

[18] Kangjia Shao,Yang Wang,Zhengyang Zhou,Xike Xie, **Guang Wang**. TrajForesee: How limited detailed trajectories enhance large-scale sparse information to predict vehicle trajectories? *IEEE International Conference on Data Engineering (**ICDE2021**)*.

[19] Sihong He, Lynn Pepin, **Guang Wang**, Desheng Zhang, and Fei Miao. Data-Driven Distributionally Robust Electric Vehicle Balancing for Mobility-on-Demand Systems under Demand and Supply Uncertainties. *IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS**)*.

[20] Feng Wang, Zhen Zhong, **Guang Wang**, and Tao Tang. A Penalized Convolution Model for Oil Leakage Detection in Electro-hydraulic Railway Point Systems. *IEEE Transactions on Instrumentation & Measurement (**IEEE TIM**)*. 2020.

[21] Ximin Chang,Jianjun Wu,Huijun Sun, **Guang Wang**, Ziyan Feng, and Xu Bao. Understanding and predicting short-term passenger flow of station-free shared bike: A spatiotemporal deep learning approach. *IEEE Intelligent Transportation Systems Magazine (**IEEE ITSM**)*.2020.

[22] Hangyu Qi, Tianhua Xu, **Guang Wang**, Yu Cheng, and Cong Chen. RMYOLOv3-Tiny: A New Deep Learning Architecture for Real-Time Detection of Track Fasteners. ***Computers in Industry***. 2020.

[23] Tianhua Xu, **Guang Wang**, Haifeng Wang, Tangming Yuan, and Zhiwang Zhong. Gap Measurement of Point Machine Using Adaptive Wavelet Threshold and Mathematical Morphology. ***Sensors***, 16(12):2006, 2016.

[24] Cong Chen, Tianhua Xu, **Guang Wang**, Yao Zhang, Hangyu Qi, and Bo Li. Railway Turnout System RUL Prediction Based on Feature Fusion and Genetic Programming. ***Measurement***, 2019.

[25] Chunni Lin, **Guang Wang**, and Tianhua Xu. Failure Cause Extraction of Railway Switches Based on Text Mining. *In 2017 International Conference on Computer Science and Artificial Intelligence (CSAI)*, pages 237-241. ACM, 2017.

[26] Tianhua Xu, **Guang Wang**, and Haifeng Wang. Multiple Fault Diagnosis and Prognosis of Chinese Train Control Systems. *In 1st International Workshop on Structural Health Monitoring for Railway System (IWSHM-RS 2016)*, 2016.

[27] Zhihan Fang, **Guang Wang**, Desheng Zhang. Modeling Fine-Grained Human Mobility on Cellular Networks. (Poster@WWW). ACM, 2020.

——————Under Submission Papers——————

More than 10 anonymous conference papers are under submission.

[28] **Guang Wang**, Shuxin Zhong,Shuai Wang, Fan Zhang, Fei Miao, Zheng Dong, and Desheng Zhang. FairMove: Fairness-Aware Vehicle Displacement for Large-Scale Electric Taxi Fleets with Centralized Deep Reinforcement Learning. *IEEE Transactions on Knowledge and Data Engineering (IEEE TKDE)*. Under Submission.

[29] Shuai Wang, Xin Zhu, **Guang Wang**, Desheng Zhang, Lai Tu, and Tian He. W^{2}Parking: Establishing A Win-Win Contract Parking Sharing under Supply Uncertainties. *IEEE Transactions on Mobile Computing*. Under Submission.

[30] Xuekai Wang, Tao Tang, Shuai Su, and **Guang Wang**. Energy-efficient Cooperative Control for Metro Trains: A Multi-agent Reinforcement Learning Approach. *IEEE Transactions on Intelligent Transportation Systems*. Under Submission.

[31] Yao Zhang, Tianhua Xu, **Guang Wang**, and Cong Chen. Remaining Useful Life Prediction of Railway Turnout Systems Based on Improved Sparse Auto Encoder and Gated Recurrent Unit Network. *IEEE Transactions on Intelligent Transportation Systems*. Under Submission.

[32] Tian Xiao, Tianhua Xu, Hao Xing, Yao Zhang, **Guang Wang**, and Mengchu Zhou. Limited-lookahead A* Search Algorithm for Synthesis of High-Speed Train Controllers. *International Journal of Control, Automation and Systems*. Under Submission.

[33] Chaochao Zhu, Yang Wang, Zhengyang Zhou, **Guang Wang**, and Xike Xie. Sensing Traffic Statuses of Entire Urban Road Network with Sparsely Distributed Reliable Sensors. *IEEE Transactions on Mobile Computing*. Under Submission.

PROPOSALS & GRANTS

Contributor for the following proposals, which are led by my advisor:

1. **NSF SCC**-IRG Track 1: Socially Informed Services Conflict Governance through Specification, Detection, Resolution and Prevention. Award Number: 1952096. *NSF SCC: Smart and Connected Community Program*. Awarded Amount: $2,300,000.

2. **NSF CPS**: Small: Collaborative Research: Improving Efficiency of Electric Vehicle Fleets: A Data-Driven Control Framework for Heterogeneous Mobile Cyber Physical Systems. Award Number: 1932223. *NSF CPS: Cyber-Physical Systems Program*. Awarded Amount: $562,336.

3. **NSF S&AS**: FND: COLLAB: Adaptable Vehicular Sensing and Control for Fleet-Oriented Systems in Smart Cities. Award Number: 1849238. *NSF S&AS: Smart and Autonomous Systems*. Awarded Amount: $649,883.

HONORS & AWARDS

Student Travel Grant from ACM/NSF SigKDD 2020		08.2020
SGS Conference Travel Award of Rutgers		02.2020
Student Travel Grant from IEEE/NSF RTSS 2018		11.2018
Fellowship of Rutgers University	*2% of all CS Ph.D. student*	09.2018
TA & RA Professional Development Fund Award of Rutgers University		03.2018
Fellowship of Rutgers University	*2% of all CS Ph.D. student*	09.2017
Excellent Master Thesis Award of Beijing Jiaotong University		03.2017
Outstanding graduate student of Beijing Jiaotong University		03.2017
2011 Collaborative Innovation Center Fellowship	*to contributing researcher*	09.2016
Traffic Control Technology Fellowship	*to contributing researcher*	11.2016
The First Prize Scholarship		10.2016
The First Prize Scholarship		10.2015
The First Prize Scholarship		10.2014
National Scholarship	*0.2% in all Chinese college students*	11.2013
The Special Prize Scholarship	*only the top one student has the qualification*	06.2014
The Special Prize Scholarship		10.2013

The Second Prize Scholarship	11.2012
The Second Prize Scholarship	11.2011
The First Prize of the Chinese Mathematics Competitions of Province	11.2013
The Third Prize of National English Contest for College Students	05.2012
The First Prize of the Mathematics Competition in ECJTU	11.2013
The Third Prize of the Mathematics Competition in ECJTU	11.2012
The First Prize of electronic design competition in ECJTU	12.2012
Merit student four times	11.2011 06.2014 11.2015 11.2016

RESEARCH EXPERIENCES

Research in Rutgers University (RU) 09.2017 - Present

- Focusing on large-scale and long-term urban data analytics and mining.
- Sharing economy and recommendation system
- Developing charging models for electric vehicles, providing decision-making for governments, public transport companies, and car owners.
- Designing charging recommendation algorithms for heterogeneous electric vehicle fleets.
- Contributions led to more than 10 first-author papers in top venues of Computer Science.

Research Intern in Chinese Academy of Sciences (SIAT, CAS) 05.2017 - 07.2017

- Conducted analyses and modeling on an extremely-large-scale and long-span transportation dataset collected from one of the biggest cities in China, including taxicabs, buses, subways.
- Designed a fleet-oriented charging recommendation for electric taxis.
- Contributions led to one first-author paper submission in Ubicomp.

Research Assistant in Beijing Jiaotong University (BJTU) 09.2014 - 03.2017

- Conducted data integration and mining for fault diagnosis and prognosis of Chinese Train Control Systems, mainly used text mining techniques.
- Developed machine learning-based failure prediction methods for railway systems and provided operation and maintenance decisions for railway corporations.
- Contributions led to two first-author papers and three second-author papers.

TEACHING

Teaching Assistant Rutgers, The State University of New Jersey
Discrete Structure I
06.2019-08.2019

Teaching Assistant Rutgers, The State University of New Jersey
Principles of Programming Languages
01.2019-05.2019

Teaching Assistant Rutgers, The State University of New Jersey
Discrete Structure II
09.2018-12.2018

Teaching Assistant Rutgers, The State University of New Jersey
Discrete Structure I
06.2018-08.2018

Teaching Assistant Rutgers, The State University of New Jersey
Principles of Programming Languages
01.2018-05.2018

Teaching Assistant Rutgers, The State University of New Jersey
Discrete Structure I
09.2017-12.2017

Teaching Assistant Beijing Jiaotong University
System Safety Design Based on Model Driven Architecture
09.2016-01.2017

Teaching Assistant Beijing Jiaotong University
Digital Signal Processing
02.2016-06.2016

Teaching Assistant Beijing Jiaotong University
System Safety Design Based on Model Driven Architecture
09.2014-01.2015

Guest Lecturer Rutgers, The State University of New Jersey
Computational Economics for Data Analytics
10.2018

SERVICE

Student Volunteer
Student Volunteer for UBICOMP/ISWC 2019 in London.
Student Volunteer for KDD 2020, Virtual Conference.
Conference Program Committee
International Conf. on Sensor Device Technologies and Applications (SENSORDEVICES 2020)
International Conference on Fuzzy Systems and Data Mining (FSDM 2018, 2019)
International Conference on Electronics, Communications and Networks (CECNet 2019)
Journal Reviewer
Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT 02/2019, 05/2019, 08/2019, 11/2019, 05/2020)
IEEE Transactions on Mobile Computing (TMC 2020)
IEEE Transactions on Services Computing (TSC 2020)
IEEE Intelligent Transportation Systems Magazine (2020)
Journal of Ambient Intelligence and Humanized (2017)
Sub-reviewer
ACM Conference on Embedded Networked Sensor Systems (SenSys 2018, 2020)
International Conference on Distributed Computing in Sensor Systems (DCOSS 2019, 2020)
IEEE International Conference on Smart Computing (SmartComp 2019, 2020)
IEEE International Conference on Mobile Ad-Hoc and Smart Systems (MASS 2019)
International Conference on Parallel and Distributed Systems (ICPADS 2019)
International Conference on Sensing, Communication and Networking (SECON 2018, 2019)
ACM/IEEE International Conference on Cyber-Physical Systems (ICCPS 2018)
International Conference on Computer Communications and Networks (ICCCN 2018)
International Conference on Embedded Wireless Systems and Networks (EWSN 2017, 2020)

STUDENT MENTOR

Throughout my Ph.D. experience I have spent a substantial amount of time mentoring undergraduate and master's students research projects in their independent study research projects and collaborative projects. These students include:

Kush Aswani	Master Student; Electric Vehicle Simulator
Yuefei Chen	Undergraduate Student; Electric Vehicle Simulator
Harsh Rajkumar	Master Student; Carsharing User behavior study, coauthored a UbiComp paper
Yingquan Wang	Ph.D. Student; Ridesharing order dispatching
Hongjian Zhao	Master Student; User value mining
Chaochao Zhu	Master Student; Passenger wait time and urban sensing; coauthored two papers
Lin Jiang	Master Student; Fairness-aware order dispatching
Yao Lu	Master Student; Carpooling with deadlines
Jia Qu	Master Student; Entity recognition in texts
Ruoqin Li	Master Student; Text mining for failure prediction
Jianyu Qiu	Undergraduate Student; Visualization and data analysis of ridesharing
Xuan'ang Wang	Undergraduate Student; Visualization and data analysis of electric taxis
Bang An	Undergraduate student; Visualization and data analysis, now Ph.D. at Iowa
Kaitlin Taylor	Undergraduate student; Visualization and data analysis
Xiuyuan Chen	Undergrad student; Data analysis and visualization; coauthored a MobiCom paper

REFERENCES

Desheng Zhang, Ph.D. Advisor
Visiting professor of Media Lab, MIT
Computer Science of Rutgers University, USA
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Vivek K. Singh, Associate Professor
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Rutgers University, USA
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Fei Miao, Assistant Professor
Computer Science & Engineering Department
University of Connecticut, USA
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