

XUAN JIANG

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Xuan is pursuing a **Ph.D. at University of California, Berkeley majoring in Transportation Engineering, minoring in AI and High-Performance Parallel Computing**. His research activity focuses on facing the current challenges related to the design of a microscope and mesoscopic approach for the analysis of a transport system in an urban context in order to more in detail estimate its impacts and those related to different scenarios that may include the introduction of new technologies, strategies, and means of transport of the future, as well as more specific studies: shared biking pricing and dock stations analysis, vertiport location selections for urban air mobility, analysis of the resilience of the airport network following unforeseen events and so on.

Research Experience

Massachusetts Institute of Technology, Cambridge, MA **May 2023 – Now**

Visiting Scholar in JTL - Urban Mobility Lab at MIT. Utilize an RL approach to address bus bunching which involved strategies such as skipping, holding, and turning around, and we evaluate the efficacy of multi-line attempts using high-performance computing-based traffic simulators. Supervisor: Jinhua Zhao and Haris Koutsopoulos

University of California, Berkeley, CA **August 2020 – Now**

Lawrence Berkeley National Laboratory, Berkeley, CA **June 2021 – May 2023**

Graduate Student Researcher in the EA - Energy Analysis Env Impacts Division. Develop models and software implementations of travel behavior and multi-modal transportation systems. Supervisor: Thomas Wenzel

University of California, Berkeley, CA **August 2020 – Now**

Research Scholarship in Transportation Engineering at Civil and Environmental Department's Aviation Innovation Research Lab. Develop GPU-based parallel multi-modal micro traffic operation simulator. Supervisor: Prof. Raja Sengupta. Co-supervisor Prof. Joan Walker, Prof. James Demmel, Prof. Mark Hansen, Prof. Daniel Rodriguez

National Academies of Sciences, Engineering, and Medicine, Washington DC **April 2022 – Now**

Young Member in transportation research board standing committee on aviation safety, security and emergency management (AV090) Review aviation-related papers, triennial strategic plan, and airport cooperative research program (ACRP) problem statements. Chair: Gaël Le Bris

Academic Education

University of California, Berkeley **June 2021 – May 2025(Exp.)**

PhD in Transportation Engineering (Minor in Computer Science) GPA:4.0 / 4.0 *Berkeley, CA*

Courses: Applications of Parallel Computers, Introduction to ML, Back-End Web Architecture, Software Dev

University of California, Berkeley **July 2020 – May 2021**

Master of Science in Transportation Engineering GPA:4.0 / 4.0 *Berkeley, CA*

Courses: Data Structures and Algorithms, Introduction to Database Systems, Introduction to AI, Operating Sys

Tongji University **Sep. 2016 – May 2020**

Bachelor of Science in Traffic Engineering | Object-Oriented Design, Compilers, Internet Protocols *Shanghai, China*

Experience

Lawrence Berkeley National Laboratory **June 2021 – Dec. 2022(Exp.)**

GSRA 🌐 [LBNL-UCB-STI/beam/Xuan/ActivitySim-micromobility](#) *Berkeley, CA*

- Deploy agent based traffic simulation on AWS EC2 instances to enhance cloud computation and multi-task implement but also on NERSC(National Energy Research Scientific Computing Center) to utilize the Cray EX system with AMD CPUs and NVIDIA A100 GPUs Berkeley Lab owns
- Inherit the Akka FSM trait which provides a domain-specific language for programming agent actions as a finite state machine to achieve the goal of doing **traffic simulation based on 2,466,019** households travel plans from bay area

China Ocean Shipping Company **July 2020 – Oct. 2020**

Data Engineer Intern *Shanghai, China*

- Built an enterprise-level Database that integrated **100,000+ shipping information** on top of Hadoop and Hive.
- Implemented the backend Restful API to provide up-to-date access to Google Earth and Kylin data.
- This API provided an intelligence utility that equipped **2000+ analysts** in the company.

Eastrong International Logistics Co., Ltd

Jan. 2018 – May. 2018

Data Scientist Intern

Shanghai, China

- Conducted an inventory forecast by building a linear regression model in Python based on historical data, which increases the **accuracy** by **17%** and further analyze the causality relationships between different factors.
- Validated the prediction on dataset, and developed a dynamic visualization dashboard with JavaScript and Tableau.

Published Papers

Jiang, X., Laurence Lu, and Linyue Song. "Incompressible Fluid Simulation Parallelization with OpenMP, MPI, and CUDA." Advances in Information and Communication: Proceedings of the **2023** Future of Information and Communication Conference (FICC), Volume 2. Cham: Springer Nature Switzerland, **2023**. [Conference paper] DOI: https://doi.org/10.1007/978-3-031-28073-3_28

Jiang, X., Tang, Y., Tang, Z., Cao, J., Bulusu, V., Poliziani, C., Sengupta, R. (**2023**). Simulating the Integration of Urban Air Mobility into Existing Transportation Systems: A Survey. arXiv preprint arXiv:2301.12901. [submitted to Transportation Research Part E: Logistics and Transportation Review] DOI: <https://doi.org/10.48550/arXiv.2301.12901>

Jiang, X. (**2022**). Optimizing Matrix Multiplication. [Conference paper] DOI: [10.31219/osf.io/dfpgq](https://doi.org/10.31219/osf.io/dfpgq)

Jiang, X., Agerup, J. F., & Tang, Y. (**2023**). Benchmarking and preparing LPSim for scalability on multiple GPUs. [Conference paper] DOI: [10.31219/osf.io/ezjrc](https://doi.org/10.31219/osf.io/ezjrc)

Zheng, W., Yang, H. F., Cai, J., Wang, P., **Jiang, X.**, Du, S. S., ... Wang, Z. (**2023**). Integrating the traffic science with representation learning for city-wide network congestion prediction. Information Fusion, 99, 101837. [Journal paper] DOI: [10.1016/j.inffus.2023.101837](https://doi.org/10.1016/j.inffus.2023.101837)

Jiang, X., Peng, X., Bulusu, V., Poliziani, C., Chatterji, G., & Sengupta, R. (2022, September). A Metrics-based Method for Evaluating Corridors for Urban Air Mobility Operations. In **2022 IEEE International Smart Cities Conference (ISC2)** (pp. 1-7). IEEE. [Conference paper] DOI: [10.1109/ISC255366.2022.9922442](https://doi.org/10.1109/ISC255366.2022.9922442)

Chen, A., Park, B., & **Jiang, X.** (**2022**). Parallelizing a Particle Simulation on Nersc's High Performance Computer Cori. [Conference paper] DOI: [10.31219/osf.io/xmtbk](https://doi.org/10.31219/osf.io/xmtbk)

Pham, H., **Jiang, X.**, & Zhang, C. (**2022**). Causality and Advanced Models in Trip Mode Prediction: Interest in Choosing Swissmetro. [Conference paper] DOI: [10.31219/osf.io/m4w38](https://doi.org/10.31219/osf.io/m4w38)

Jiang, X., Peng, X., Bulusu, V., Poliziani, C., Chatterji, G., & Sengupta, R. (**2022**). Air Corridor Evaluation with Purpose-specific Metrics. [Conference paper] DOI: [10.31219/osf.io/fqu3k](https://doi.org/10.31219/osf.io/fqu3k)

Everts, J., & **Jiang, X.** (**2021**). Making sense of electrical vehicle discussions using sentiment analysis on closely related news and user comments. arXiv preprint arXiv:2112.12327. [Conference paper] DOI: [10.48550/arXiv.2112.12327](https://doi.org/10.48550/arXiv.2112.12327)

Bauranov, A., Parks, S., **Jiang, X.**, Rakas, J., & González, M. C. (**2021**). Quantifying the Resilience of the US Domestic Aviation Network During the COVID-19 Pandemic. Frontiers in Built Environment, 7, 642295. [Journal paper] DOI: [10.3389/fbuil.2021.642295](https://doi.org/10.3389/fbuil.2021.642295)

Chai, C., Lu, J., **Jiang, X.**, Shi, X., & Zeng, Z. (**2021**). An automated machine learning (automl) method for driving distraction detection based on lane-keeping performance. arXiv preprint arXiv:2103.08311. [Journal paper] DOI: [10.48550/arXiv.2103.08311](https://doi.org/10.48550/arXiv.2103.08311)

Huang, W., Yan, C., & **Jiang, X.** (**2019**). Chemical and rheology evaluation on the field short-term aging of high content polymer modified asphalt (No. 19-00486). [Conference paper] URL: <https://trid.trb.org/view/1572334>

Journals Peer Reviewer

[TRB2023](#) (19 articles - Publons) [Frontiers in Psychology](#) (1 article - Accepted) [ITSC 2023](#) (3 articles)

[IEEE Intelligent Transportation Systems Society Conference 2022](#) (3 articles) [Scientific Reports](#) (1 article - Publons)

Awards

[Joseph M Sussman 2021 Best Paper Prize](#)

[NSF AI workshop Phase II Travel Award](#)

Projects

Shenzhen Metro Website | *Java, Docker, JavaScript, React, Spring Cloud, JWT, Mybatis Plus, Redis, AWS* [GitHub](#)

- Split-Stack-Developed an online metro application that includes a user system and a management system.
- Implemented authority management, subway management, statistical analysis, and line classification management.
- Used Spring Boot for the back-end, React+Hooks For the front-end, and Amazon S3 to store files.
- Deployed the web application to real users with AWS Elastic Beanstalk.

Shanghai Airport App | *Java, Spring Boot, Shiro, Redis, Mybatis, Docker, Swagger* [GitHub](#)

- Established the passenger management and travel management modules' back-end of a commercial mobile app.
- Deployed and achieved distributed architecture, load balancing and hot backup via Haproxy & XtraBackup.
- Optimized around **300** SQL query through Slow Query Log, and reduced **80%** query time through ElasticSearch.

Interpreter for a new Script Language | *Java, C, Git, GluonJ* [GitHub](#)

- Designed a new high-level dynamically typed, multi-paradigm, interpreted programming language.
- Implemented the interpreter with java which features garbage collection, lexical scope, closures, classes, and inheritance.
- Optimized the traversal of Abstract Syntax Tree and improved the performance by redesigning the Virtual Machine.

Technical Skills

Languages: Java, Go, Python, C/C++, HTML/CSS, JavaScript, SQL

Frameworks/DataBases: gRPC, Spring Boot, Node.js, MyBatis, MySQL, MongoDB, Redis, Amazon S3

Developer Tools: Gradle, Maven, Git, Docker, Nginx, Tomcat, Amazon EC2, Elastic Beanstalk