

# Jing (Felicia) Ma

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## EDUCATION

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### Boston University

Boston, MA

*Ph.D. in Physics; Master of Arts in Physics*

*Sep. 2015 – May. 2022*

- The 2019 – 2020 Outstanding Teaching Fellow in the Department of Physics (recognized by the Graduate School of Arts & Sciences, Boston University)

### Peking University

Beijing, China

*Bachelor of Science in Physics; Bachelor of Economics*

*Sep. 2011 – Jul. 2015*

## WORK EXPERIENCE

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### TuSimple | C++14, Python3, PostgreSQL, ROS, Docker, AWS

San Diego, CA

*Software Engineer, Offboard Algorithm*

*Jun. 2022 – present*

- Maintained the simulation platform that allows for the creation and editing of scenarios, and provides performance evaluations; actively discussed with our client teams, and delivered timely and reliable updates to the platform.
- Maintained databases of simulation scenarios and task results, and extended their structures to allow for more flexibility in testing cases design, and to deliver user-friendly performance results.
- Independently designed and developed the pipeline to regenerate datasets synchronously and reproducibly, through **ROS** requests and responses; deployed to production, the new pipeline has proven to significantly reduce in overhead, run comparably to or even faster than the asynchronized version, on average, and also fixed the frame loss issue.

*Software Engineer Intern, Simulation Platform*

*May. 2021 – Aug. 2021*

- Maintained the backend of the simulation platform (e.g., unified the standard of frame alignments, redesigned the frame logic to ensure consistency in results replay), and added new functionalities to support internal and external needs.
- Refactored the metrics system for the simulation platform, decoupled the evaluation process from running, and thus enabled the possibility to design future-dependent as well as history-dependent evaluators.

## PROJECTS

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### Critical Phenomena in Epidemic Models | C++, Python3

*Sep. 2019 – May. 2022*

- Mapped the SIR (Susceptible-Infected-Recovered) epidemic model as a percolation process embedded in networks.
- Studied critical phenomena and power-law behaviors of the SIR model, especially for multi-community networks, in the framework of generating functions.
- Implemented **Monte Carlo** simulations for large-size systems, and studied its difference from the theory due to finite size effects.

### Neuronal Spike Data Analysis | Python3, PyTorch, Scikit-learn

*Sep. 2018 – Aug. 2019*

- Cleaned and standardized large-scale neuronal spike data from rats, and selected features using various dimension reduction methods.
- Implemented **LSTM** models and trained on historical data, to predict future motions of the same rats, and achieved 70 – 80% explained variance.
- Proposed similarity metrics to match features, and to transfer learning between rats.

### Sharing Bike Usage Prediction | R

*Fall 2017*

- Cleaned and normalized weather data, and removed auto-correlation using the generalized least squares (**GLS**) technique.
- Implemented and compared different linear models based on adjusted R-squared, AIC, AICc, and BIC scores.
- Predicted the sharing bike usage for the following year, with correlation higher than 90%.

## SKILLS

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**Languages:** C++ (fluent), Python3 (fluent), SQL, Fortran, R, MATLAB, Java, Javascript, Go

**Tools & Skills:** Linux, Git, Vim, machine learning libraries, Docker, AWS

**Soft Skill(s):** Modeling, Problem Solving, Critical Thinking, Teamwork and Cross-Team Collaboration