

Kai Li

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EDUCATION

Stony Brook University

Ph.D. in Applied Mathematics and Statistics, Focus on Reinforcement Learning | GPA: 4.00

M.S. in Applied Mathematics and Statistics (Statistics Track) | GPA: 3.95

Advanced Graduate Certificates in Data Science and Operations Research

Stony Brook, NY

Expected May 2026

May 2022

The Ohio State University

B.S. in Mathematics (Theoretical Track) | GPA: 3.67

Minors in Computer Information Science and Economics

Columbus, OH

May 2020

SKILLS

Programming and Software: Python, R, SQL, Scikit-Learn, TensorFlow, RStudio, VS Code, Jupyter Notebook

Machine Learning and Data Science: Reinforcement learning (tabular and approximate solution methods), Machine learning (supervised and unsupervised), Data manipulation, analysis and visualization, Optimization

RESEARCH EXPERIENCE

Department of Applied Mathematics and Statistics, Stony Brook University

Research Assistant - Reinforcement Learning for Enhanced Tic-Tac-Toe and its Applications

Stony Brook, NY

Aug 2022 - Present

- Engineer a scalable computational pipeline using Python to enable rapid experimentation with diverse innovative reinforcement learning algorithms, setting the stage for expansion into more complex game domains.
- Employ rigorous statistical methods in Python to evaluate the quality of machine and human game strategies, creating custom metrics for a more objective understanding of optimal tic-tac-toe gameplay.
- Utilize a multidisciplinary approach to bridge the gap between machine learning and cognitive science, leading to reinforcement learning algorithms that optimize for win metrics while mimicking human decision-making.
- Engage actively in the academic community through peer reviews and prepare research findings for discussion at high-impact group meetings, in addition to targeting top-tier journals for publication, all while managing code and resources through VS Code.

TEACHING EXPERIENCE

Department of Applied Mathematics and Statistics, Stony Brook University

Instructor - Statistical Laboratory (Fall 2022, 2023) and Mathematical Statistics (Spring 2023, 2024)

Stony Brook, NY

Aug 2022 - Present

- Orchestrate and deliver compelling hands-on R programming and rigorous mathematical reasoning lectures, covering a wide range of data analysis topics to align with current academic research and industrial practices.
- Engineer comprehensive course materials, assignments, and assessments, incorporating real-world applications to optimize learning outcomes for an average class size of 52 students.
- Receive consistent positive feedback through course evaluations for effective teaching and ability to explain complex concepts, and was recognized with the “Excellence in Student Teaching” award for outstanding contributions.

ACADEMIC PROJECTS

Department of Computer Science, Stony Brook University

Data Science - Understanding Flight Delays

Stony Brook, NY

Aug 2021 - Dec 2021

- Strategically sourced and preprocessed comprehensive flight performance datasets using Python and pandas, employing methods such as subsetting, imputation, and encoding for predictive model optimization.
- Utilized Scikit-Learn and TensorFlow for advanced statistical methods and machine learning model construction, all within a Jupyter Notebook, to extract actionable insights informing the architecture and selection of machine learning models for flight delay prediction.
- Rigorously evaluated multiple machine learning models in Python, employing comparative analyses to select the most effective algorithms based on key performance metrics, which were then detailed in an academic LaTeX report.

Department of Applied Mathematics and Statistics, Stony Brook University

R Package - Statistical Methods for Partially Matched Samples

Stony Brook, NY

Mar 2021 - May 2021

- Architected a comprehensive R package using RStudio, focused on advanced statistical analysis of partially matched samples, seamlessly integrating methods for handling both independent samples and matched pairs designs.
- Crafted intuitive, user-centric interfaces fortified with robust documentation in R, thereby democratizing advanced statistical tools for researchers across disciplines.
- Collaborated efforts to rigorously validate the package’s statistical procedures through extensive simulation studies and peer reviews in R, resulting in a high-integrity, reliable analytical tool.