Jiajia Wang

San Diego, CA jiw133@ucsd.edu 619 953 9099 jiajia-wang-610131253 additionjj

Education

University of California, San Diego **San Diego, CA**
Ph.D in Mathematics 09/2022 – Present

- GPA: 3.91/4.00
- Coursework: Nonconvex Optimization, Numerical optimization, Tensor computation, Probability theory, Numerical ODEs, Convex analysis, Machine learning

University of California, Santa Barbara **Santa Barbara, CA**
B.S. in Applied Mathematics 09/2018-06/2021

- GPA: 3.75/4.00
- Coursework: Operation research, Statistics, Numerical analysis, Tensor decomposition, Numerical algorithms

Technical Skills

- Languages: Python (NumPy, Pandas, Scikit-learn, TensorFlow/PyTorch, CVXPY), C++, MATLAB, R, SQL
- Tools: Git, Linux, LaTeX, Web Development

Internship Experience

Academy of Mathematics and Systems Science, Chinese Academy of Science **Beijing, China**
Research assistant 08/2021- 07/2022

- Developed and mathematically validated an enhanced neural network algorithm for near-optimal VLSI circuit placement, improving solution randomness and computational speed;
- Implemented neural network algorithm using Python and C++ with CUDA-based parallel computing
- Led the development of an RNN-based pipeline leak detection system in collaboration with CNPC
- Performed extensive large-scale data analysis and preprocessing, designed and implemented the detection pipeline, and achieved significant improvements in prediction accuracy for industrial applications

Research experience

University of California, San Diego

- Developed Pareto set optimization methods to reformulate multi-task learning as single-objective problems, yielding efficient algorithms with improved performance in classification and autoencoder tasks
- Designed an iterative algorithm for bilevel optimization in SVM hyperparameter learning with reduced computational cost, and validated its accuracy and efficiency on large-scale datasets
- Developed new methods for general Nash equilibrium problems with matrix constraints
- Enhanced Moment-SOS hierarchy for matrix polynomial optimization to guarantee convergence, outperforming traditional methods in both theory and experiments
- Developed algorithms for tensor recovery with proven convergence guarantees, and validated their effectiveness through randomized experiments

University of California, Santa Barbara

- Developed mixed-precision tensor decomposition algorithms with stochastic gradient methods, optimizing GPU memory usage and computational efficiency for CP decomposition
- Compared Eigenface and Subspace Analysis via bootstrap to identify optimal face recognition method
- Engineered a pitch detection algorithm with FFT, phase analysis, and harmonic product spectrum for robust audio processing

Mentorship and Outreach

Cal-Bridge x STARS Program **San Diego, CA**
Mentor 07/2025-09/2025

- Supervised two undergraduates on optimization and data analysis projects, providing technical guidance and research support, resulting in successful completion of independent research projects