Yushen Huang
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EDUCATION

State University of New York at Stony Brook Stony Brook, New York 2021-2025
- Ph.D. in Computer Science, Cumulative GPA:4.0

Rensselaer Polytechnic Institute Troy, New York 2019-2021
- M.S. in Computational and Applied Mathematics, Cumulative GPA: 3.92

Rensselaer Polytechnic Institute Troy, New York 2016-2018
- B.S. in Mathematics, Cumulative GPA: 3.92

TECHNICAL SKILLS

- **Programming Skill:** R, Python (Numpy, Pandas, Sklearn, Pytorch, Scipy), MATLAB, C, C++ (Cilk, OpenMP, MPI)
- **Course:** Stochastic Calculus, Stochastic Process, Probability and Measure Theory, Numerical PDEs, Machine Learning

WORK EXPERIENCE

Quant Research, Castleton Commodities International Stamford, Connecticut 2023.06 - 2023.08
- Develop and implement a Spatial Equilibrium Model to predict regional prices for metals and agricultural commodities
- Enhance model accuracy to predict copper prices, achieving a 91.3% match with actual market prices
- Conduct sensitivity analysis for the global soybean market, aligning model outputs with real-world events
- Contribute to the development of the model that was successfully deployed in the European oil market post-internship

Quant Research Market, JPMorgan & Chase New York, New York 2024.06 - Present
- Analyze discrepancies between Tier 27 stress results and equity desk calculations, identifying a 236% relative error due to specific instrument type
- Develop and maintain new infrastructure for calculating Tier 27 stress to replace the system from London equity desk
- Coordinate with the managing director and equity desk to ensure alignment and update risk assessment methodologies

Research Assistant, Stony Brook University Stony Brook, New York 2022.08- Present
- Fast Option Pricing Using Nonlinear Stencils
  - Design an efficient algorithm for non-linear Stencil Computation and demonstrate that it is 1000 faster than existing algorithms
  - Apply the algorithm to American options based on the Scholes Model and Finite Difference Method
- Approximate backward differentiation of gradient flow
  - Investigate a family multi-step implicit optimization algorithm and provide convergence analysis of the algorithm
  - Implement the algorithms in deep neural networks and demonstrate that the algorithms offer stability and lower hyperparameter tuning. The normal gradient descent requires $\frac{1}{L}$ step sizes to converge, but the exact multi-step methods can converge faster without any step size restriction
- Earning Call Natural Language Processing
  - Preprocess the Earning call Transcript into question from analysts and answer from the manager
  - Use the Transformer model to get the topic switching index, which is the discrepancy between manager and analyst scripts
  - Build a Portfolio strategy that outperforms markets by 23% per year.

Research Assistant, Rensselaer Polytechnic Institute Troy, New York 2019.01- 2021.5
- Spatial parameterization of attachment processes in molecular motor-cargo systems
  - Use Stochastic-Differential Equations, Forward Kolmogorov equation and Backward Kolmogorov equation to analyze the statistical properties of the motor-cargo dynamics
  - Compare the analytical results with the simulated results and conclude that our analytical results matched with the simulated results for at least 96% accuracy

PROJECTS

Parallel Programming and Scheduler Stony Brook, New York 2022.01 - 2022.05
- Implement 3 different ways of schedulers called: distributed randomized work-stealing, distributed randomized work-sharing and centralized work-sharing for Matrix Multiplication
- The schedulers will have 50% less cache miss rate than the normal Matrix Multiplication algorithm by tuning the parameters

Parallel Stochastic Gradient Descent with Double-Pass Error-Compensated Compression
Troy, New York 2020.09 - 2020.12
- Implement a distributed learning based algorithm called Stochastic Gradient Descent with Double - Pass Error Compensated Compression which are 20% faster than the current benchmark
- Apply Top k Sparsification and Low Bit Quantization requiring 70% less memory usage
- Apply the above algorithm to deep neural network and image classification problem achieving 90% out of sample accuracy