SHIQING (WARREN) SUN

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EDUCATION

Johns Hopkins University **GPA 3.93** 2018.08 - Present
PhD in Applied Mathematics and Statistics *Baltimore, MD*
Master of Science in Engineering, Computer Science (Dual Degree)
Johns Hopkins University **GPA 3.97** 2016.08 - 2018.05
Master of Science in Engineering, Financial Mathematics *Baltimore, MD*
Fudan University 2011.08 - 2016.06
Bachelor of Science, Mathematics *Shanghai, CN*

WORK EXPERIENCE

Amazon.com, Inc. 2020.05 - 2020.08
Applied Scientist Intern *Seattle, WA*

· Researched on searching Pareto optimal points in multi-objective optimization problems in ranking.
· Implemented two major approaches, multiple gradient descent and Bayesian optimization, in multi-objective optimization, and applied implementation into decision making in recommendation system.

Parametric Portfolios Associates LLC 2019.06 - 2019.08
Machine Learning Intern *Seattle, WA*

· Applied various statistical learning models to automate portfolio manager's decision-making process of trading based on tax loss-harvesting and invented standard work-flow for model improvement
· Researched Learn-to-Rank models, and implemented RankNet, achieving significantly better prediction accuracy than statistical learning models

Graphen Inc 2018.06 - 2018.08
Quantitative Research Summer Intern *New York, NY*

· Researched deep reinforcement learning models, and implemented double deep Q-network models for trading strategies
· Constructed various machine learning models for stock prediction, and optimized over 20 various parameters to achieve best prediction accuracy

SERVICE

- Served as review in 2020 24th International Conference on System Theory, Control and Computing (ICSTCC)
- Assisted in reviewing manuscripts for IEEE Transactions on Industrial Electronics
- Served as Student Representative in 2018 Whiting School of Engineering Graduate Committee in Johns Hopkins Univ.

RESEARCH

SPSA Method Using Diagonalized Hessian Estimate
Accepted as publication in 2019 IEEE Conference on Decision and Control (CDC)

· Invented new algorithm (DiagSPSA) for stochastic optimization problems, based on second-order Hessian information but with lower computation cost
· Provided theoretical proof for asymptotic normality and efficiency of algorithm

Stochastic Optimization with Diagonal Hessian Estimates and its Comparison against Natural Gradient Methods
In Progress

· Making comprehensive comparisons between DiagSG against state-of-the-art natural gradient algorithms both theoretically in asymptotic behavior and practically in deep learning experiments.

· Justifying efficiency of DiagSG by showing essential difference between Hessian matrix and Fisher information matrix in describing loss curvature.

Research on Hessian Matrix in Deep Learning
In Progress

· Studying on components of Hessian matrices for classic combinations of loss and deep learning models and their impacts on second-order optimizers.
· Creating python software that computes Hessian components for further research in this topic.

TECHNICAL SKILLS

Programming Language	Python, C++, Matlab, SQL
Software & Tools	Latex, TensorFlow, Pytorch, Fastai, Google Cloud Platform