PENGZHAN GUO

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RESEARCH INTERESTS

Parallel Computing, Stochastic Optimization, Data Mining, Machine Learning and their applications.

ACADEMIC POSITION

Assistant Professor *July 2022 - Present*
Data Science, Duke Kunshan University.

EDUCATION

Stony Brook University, Stonybrook *Nov 2018 - Nov 2021*
Ph.D. in Applied Mathematics & Statistics. Overall GPA: 3.87/4.0
Stony Brook University, Stonybrook *Aug 2017 - Dec 2018*
M.S. in Applied Mathematics & Statistics. Overall GPA: 4.0/4.0
Suzhou University of Science and Technology, Suzhou *Aug 2013 - Jun 2017*
B.S. in Applied Mathematics and Statistics. Overall GPA: 3.6/4.0

AWARDS AND HONORS

Best Paper Award for TMC21, award for the best research paper in the conference *2021*
Travel Award for ICDM19, award for accepted conference presentations *2019*
IACS Travel Scholarship, providing up to $2000 for outstanding researchers *2019*
Chinese National Scholarship, academic excellence *2016*

RESEARCH PROJECT

My research project is including methodology and applications in machine learning and data mining.

Methodology in Machine Learning and Data Mining
Weighted Aggregating Stochastic Gradient Descent for Parallel Deep Learning

- Investigated the stochastic optimization problem for deep learning to enable introduction of a scalable parallel computing algorithm under Tensorflow.
- Reformulated the objective function for the stochastic optimization and designing efficient parallel communication rule.

Applications in Machine Learning and Data Mining
Long-term Career Path Recommendation

- Designed a case-based framework combined with reinforcement learning and Markov Chain method to find the long-term career path under different situations.
- Achieved reasonable and stable performance on big data in real world.

Dynamic Taxi Route Recommendation

- Applied a self-check mechanism in traditional reinforcement learning method, theoretically and numerically prove the efficiency of the method.
- Deployed a deep neural network to enable the model ability to automatically adjust the parameter based on real situation.

WORK EXPERIENCE

Samsung Research America May 2021- Aug 2021
Research Intern

· Applied word2vec to the browser recommendation.
· Defined the offline framework to evaluate the performance of different methods.

· Implemented a hybrid model which increases 5% compared with the best benchmarks.

Stony Brook University Jun 2018- Jan 2021
Teaching Assistant

· AMS 102: Elements of Statistics.
· AMS 502: Differential Equation and Boundary Value Problems.
· AMS 560: Big Data Systems, Algorithms and Networks.
· AMS 527: Numerical Analysis II.
· AMS 528: Numerical Analysis III.
· AMS 510 (**Taught Recitation Sessions; Mean Score: A-**): Analytical Methods for Applied Mathematics and Statistics.

PUBLICATIONS

Journal and Conference ranking: The ranking was created by the Australian Computing Research and Education Association (CORE). A, A, B, C, and other, where A* is the best.*

- **Pengzhan Guo**, Keli Xiao, Zeyang Ye, Hengshu Zhu and Wei Zhu. 2022. Intelligent Career Planning via Stochastic Subsampling Reinforcement Learning. ***Scientific Reports (SR)***, *Accepted*. (Impact Factor: 4.379)
- **Pengzhan Guo**, Keli Xiao, Zeyang Ye and Wei Zhu. 2021. Route Optimization via Environment-Aware Deep Network and Reinforcement Learning. ***ACM Transactions on Intelligent Systems and Technology (TIST)***, *forthcoming*. (Impact Factor: 4.654)
- **Pengzhan Guo**, Zeyang Ye, Keli Xiao and Wei Zhu. 2020. Weighted Aggregating Stochastic Gradient Descent for Parallel Deep Learning. ***IEEE Transactions on Knowledge and Data Engineering (TKDE)***, *forthcoming*. (Core Ranking: A*; Impact Factor: 6.977)
- **Pengzhan Guo**, Zeyang Ye and Keli Xiao. 2019. A Weighted Aggregating SGD for Scalable Parallelization in Deep Learning. In ***Proceedings of the 19th IEEE International Conference on Data Mining (ICDM 2019)***, IEEE, Beijing, China, 1072-1077. (Core Ranking: A*)
- **Pengzhan Guo** and Hailin Jin. 2017. Groemer Wallen Measure of Asymmetry for Reuleaux Polygons. ***Journal of Geometry***, Springer, 879-884. (Impact Factor: 0.85)

WORKING PAPERS AND ARTICLES UNDER REVIEW

- **Guo et al.** Multi-Agent Reinforcement Learning for Mobile Route Recommendation: A Performance-Aware Adaptive Method.
  -**Ready to be submitted**
- **Guo et al.** Dynamical Partial Multi-Agent Reinforcement Learning for Sequential Recommendation.
  -**Under revision**
- **Guo et al.** Customizable Long-Term Career Path Recommendation: A Stochastic Search Method.
  -**Best Paper Award**, *the 2021 ACM SIGKDD International Workshop on Talent and Management Computing*
  - Presented at ***the 2020 INFORMS Workshop on Data Science***.

RESEARCH TALKS

- P. Guo, The 2021 ACM SIGKDD Conference (Session: International Workshop on Talent and Management Computing), "Customizable Long-Term Career Path Recommendation: A Stochastic Search Method," Online. (August 2021).
- P. Guo, Stony Brook University College of Business Research Seminar, "Intelligent Career Planning," Online. (April 2021).
- P. Guo, The 2020 INFORMS Annual Meeting (Session: Data Science Workshop), "Customizable Career Path Recommendation with Multi-Criteria Stochastic Optimization," Online. (November 2020).

- P. Guo, Stony Brook University Applied Mathematics & Statistics Joint QF-STAT PhD Webinars, "Customizable Career Path Recommendation with Multi-Criteria Stochastic Optimization," Online. (October 2020).
- P. Guo, The 2019 IEEE International Conference on Data Mining (Session: Distributed & High Performance Data Mining), "A Weighted Aggregating SGD for Scalable Parallelization in Deep Learning," IEEE, Beijing, China. (November 2019).

PROFESSIONAL ACTIVITIES

Journal Article Review

- **IEEE Access**
- **PeerJ Computer Science**
- **Electronic Commerce Research and Applications**
- **IEEE Transactions on Neural Networks and Learning Systems (TNNLS)**

Conference Paper Review

- **KDD**: ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (2021, 2020)
- **ICDM**: IEEE International Conference on Data Mining (2021, 2020)
- **CIKM**: ACM International Conference on Information and Knowledge Management (2021, 2020)
- **WSDM**: ACM International Conference on Web Search and Data Mining (2021)

SKILLS

Programming languages Python, Matlab, C, C++, R, SAS, LaTex