Guangji Bai (He/Him/His)

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Research Statement

I am a third-year Ph.D. student at CS Department, Emory University working with Prof. Liang Zhao. I am generally interested in **designing efficient, generalizable, and explainable learning algorithms with theoretical guarantee**. Specifically, my current research topics include but are not limited to 1. Designing various learning strategies for more advanced and human-like AI, such as multi-task learning (MTL), continual learning, and domain generalization (DG). 2. Developing large-scale optimization algorithms with better scalability and performance, such as distributed parallel training for Graph Neural Networks (GNNs) and gradient free optimization via e.g., alternating direction method of multipliers (ADMM), etc.

Education

Emory University — **Atlanta, GA**
Ph.D. in Computer Science — 2020.8-Present

The George Washington University — **Washington D.C.**
M.S. in Statistics — 2018.9-2020.5

Fudan University — **Shanghai, China**
B.S. in Mathematics — 2014.9-2018.6

Research Experiences

Department of Computer Science, Emory University — **Atlanta, GA**
Graduate Research Assistant — 2020.8-Present

- Leading research projects on various topics of machine learning, such as multi-task learning, continual learning, and domain generalization, under the supervision of Dr. Liang Zhao.
- Collaborating with AWS and other labs on distributed Graph Neural Networks optimization.
- Providing theoretical analyses and mathematical proofs (e.g., generalization error bound, convergence analysis) for several research projects on deep learning.

2017 COMAP Mathematics Modeling Contest — **Shanghai, China**
Team leader — 2017.1-2017.2

- Mainly responsible for building models and writing papers.
- Honorable Mentions.

Internship

NEC Laboratory America — **Princeton, NJ.**
Data Science and System Security Team — 2023.5-2023.8

- Developing machine learning algorithms for domain adaptation on time series data.

Equal Employment Opportunity Commission — **Washington D.C.**
Data Team — 2019.5-2019.7

- Implementing statistical data privacy algorithms for sensitive data processing.

China Financial Futures Exchange — **Shanghai, China**
IT Department — 2017.7-2017.9

- Developing the data platform for daily overview of global financial market.

Skills

- Programming: Java-intermediate, Python-proficient, PyTorch-proficient
- English-Proficiency
- Chinese – Native proficiency

Selected Publications

- **Guangji Bai**, Chen Ling*, Liang Zhao. “Temporal Domain Generalization with Drift-Aware Dynamic Neural Networks”. *(ICLR 2023, **Oral**).*

- **Guangji Bai**, Chen Ling, Yuyang Gao, Liang Zhao. “Saliency-Augmented Memory Completion for Continual Learning.” SIAM International Conference on Data Mining *(SDM 2023)*
- **Guangji Bai**, Johnny Torres*, Junxiang Wang, Liang Zhao, Carmen Vaca, Cristina Abad. “Sign-Regularized Multi-Task Learning.” SIAM International Conference on Data Mining *(SDM 2023)*
- **Guangji Bai**, Liang Zhao. “Saliency-Regularized Deep Multi-Task Learning.” The 28th ACM SIGKDD Conference on Knowledge Discovery and Data Mining *(KDD 2022)*
- Yuyang Gao, Tong Sun, **Guangji Bai**, Siyi Gu, Sungsoo Hong, Liang Zhao. “RES: A Robust Framework for Guiding Visual Explanation.” The 28th ACM SIGKDD Conference on Knowledge Discovery and Data Mining *(KDD 2022)*
- Zishan Gu, Ke Zhang, **Guangji Bai**, Liang Chen, Liang Zhao, Carl Yang. “Dynamic Activation of Clients and Parameters for Federated Learning over Heterogeneous Graphs.” The 31st ACM Conference on Information and Knowledge Management (*ICDE 2023*).
- Dazhou Yu*, **Guangji Bai***, Yun Li, Liang Zhao. “Deep Spatial Domain Generalization”. The 22nd IEEE International Conference on Data Mining (*ICDM 2022*).

*Equal contribution

For a comprehensive list of my research and publication, please refer to my Google Scholar page.

Professional Services

PC member for NeurIPS (22’,23’), AISTATS 2023.

Reviewer for KDD, ICML, ICLR, AAAI, ICDM.

Awards

- ICLR 2023 oral (top 5% among accepted papers)
- SDM 2023 student travel award
- KDD 2022 student travel award
- CIKM 2022 student travel award