Zhenxun Zhuang

PH.D. IN COMPUTER SCIENCE

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Education

Boston University — *Boston, MA, U.S.*

PH.D. IN COMPUTER SCIENCE — *Aug. 2018 - Aug. 2022*

Dissertation: Adaptive Strategies in Non-convex Optimization **Adviser**: Francesco Orabona

Stony Brook University — *Stony Brook, NY, U.S.*

PH.D. IN COMPUTER SCIENCE **ADVISER**: FRANCESCO ORABONA — *Aug. 2016 - Aug. 2018*

University of Science and Technology of China (USTC) — *Hefei, Anhui, China*

B.ENG. IN ELECTRONIC INFORMATION ENGINEERING — *Sep. 2012 - Jun. 2016*

Thesis: Prediction & Transform Combined Intra Coding in HEVC **Adviser**: Feng Wu

Internships

Facebook — *Remote*

MACHINE LEARNING ENGINEER INTERN — *Jun. 2021 - Aug. 2021*

- Added support for deriving features from a new data source on training machine learning models.
- Migrated a machine learning model to a new data platform for privacy reasons, retrained the model using new data, and fine-tuned the model to attain matching performance compared with the model currently used in prod.
- Developed a command-line tool for tracing and visualizing the lineage information from a model and a feature it uses back to data source tables and columns used to generate this feature which reduces the time taken to parse lineage information from >5 minutes to <15 seconds.

Meemo — *San Francisco, CA, U.S.*

DATA SCIENCE INTERN — *Jun. 2020 - Aug. 2020*

Meemo is a start-up for discovering personalized rewards and insights based on users' recent transactions and purchase history.

- Designed, implemented, and deployed two features on learning delightful insights of users' spending habits and memorable experience.
- Developed an API to automate the process of moderation of contents sent to users which has been used by the whole team and shortened the contents preparation time by at least 50%.
- Designed several visualization tools for investigating a user's purchase history from different angles.

IQVIA — *Plymouth Meeting, PA, U.S.*

MACHINE LEARNING INTERN — *May 2019 - Aug. 2019*

- Extended the Online Meta-Learning framework to the non-convex setting and introduced a new performance measure to replace the original one which is only applicable to convex cases.
- Solved a stochastic optimization problem by employing this algorithm, theoretically proved its performance guarantee and robustness to any hyperparameter initialization, and empirically showed its improvement over traditional methods by 20% on accuracy.
- Published results in NeurIPS 2019 workshop and ICASSP 2020.

Publications

Understanding AdamW through Proximal Methods and Scale-Freeness — *Transactions on Machine Learning Research*

ZHENXUN ZHUANG, MINGRUI LIU, ASHOK CUTKOSKY, FRANCESCO ORABONA. — *August 2022*

A Second look at Exponential and Cosine Step Sizes: Simplicity, Convergence, and Performance — *ICML 2021*

XIAOYU LI*, ZHENXUN ZHUANG*, FRANCESCO ORABONA. (* *Equal contribution*) — *Virtual*

No-regret Non-convex Online Meta-Learning — *ICASSP 2020*

ZHENXUN ZHUANG, YUNLONG WANG, KEZI YU, SONGTAO LU — *Barcelona, Spain*

Surrogate Losses for Online Learning of Stepsizes in Stochastic Non-Convex Optimization — *ICML 2019*

ZHENXUN ZHUANG, ASHOK CUTKOSKY, FRANCESCO ORABONA. — *Long Beach, CA, U.S.*

Preprints and Workshop Papers

A Communication-Efficient Distributed Gradient Clipping Algorithm for Training Deep Neural Networks — *arXiv 2022*

MINGRUI LIU, ZHENXUN ZHUANG, YUNWEI LEI, CHUNYANG LIAO — *arXiv:2205.05040*

Online Meta-Learning on Non-convex Setting — *NeurIPS workshop: MetaLearn 2019*

ZHENXUN ZHUANG, KEZI YU, SONGTAO LU, LUCAS GLASS, YUNLONG WANG. — *Vancouver, Canada*

Project Experience

Optimal Lab, Boston University — *Boston, MA, U.S.*

Research Assistant — *May. 2017 - PRESENT*

- Designed algorithms for non-convex optimization problems and backed them up with theoretical convergence analyses, with special interests on Stochastic Gradient Descent (SGD) and its many variants.
- Implemented those algorithms in PyTorch/Tensorflow and verified their empirical performance in problems from image classification, natural language processing (NLP), and generative adversarial networks (GANs).

Future Video Codec Research Group, USTC — *Hefei, Anhui, China*

Undergraduate Research Assistant — *Dec. 2014 - Jun. 2016*

- Designed a novel intra-picture prediction scheme including transform, quantization, and entropy coding based on the High Efficiency Video Coding (HEVC) standard.
- Achieved the bitrate reduction on compressing a video by 1% on average, with 10% on certain types of videos, while preserving the perceptual quality by employing the above scheme.

Academic Services

2022	**Reviewer**, The 36th Conference on Neural Information Processing Systems (NeurIPS)	*New Orleans, LA, US*
2022	**Reviewer**, The 39th International Conference on Machine Learning (ICML)	*Baltimore, MD, US*
2021	**Reviewer**, The 35th Conference on Neural Information Processing Systems (NeurIPS)	*Virtual*
2021	**Expert Reviewer**, The 38th International Conference on Machine Learning (ICML)	*Virtual*
2020	**Reviewer**, The 34th Conference on Neural Information Processing Systems (NeurIPS)	*Virtual*
2020	**Reviewer**, The 37th International Conference on Machine Learning (ICML)	*Vienna, Austria*
2020	**Reviewer**, The 23rd International Conference on Artificial Intelligence and Statistics (AISTATS)	*Palermo, Sicily, Italy*
2019	**Reviewer**, The 33rd Conference on Neural Information Processing Systems (NeurIPS)	*Vancouver , Canada*

Teaching Activities

2017	**Teaching Assistant**, CSE 303 Introduction to the Theory of Computation, **Instr.** Anita Wasilewska	*Stony Brook Univ.*
2016	**Teaching Assistant**, CSE 101 Introduction To Computers, **Instr.** Michael Tashbook	*Stony Brook Univ.*

Awards

2015	**Gold Prize (top 3%)**, Outstanding Undergraduate Scholarship	*USTC, Hefei, China*
2014	**Di'ao Scholarship**,	*USTC, Hefei, China*
2013	**Silver Prize (top 11%)**, Outstanding Undergraduate Scholarship	*USTC, Hefei, China*

Technical Skills

Python, PyTorch, C, Matlab, LaTeX, HTML