Runtian Zhai

rzhai@cmu.edu
runtianzhai.com
RuntianZ
+1 412-933-9633

Education

Carnegie Mellon University *Aug 2020 – May 2025 (expected)*
Ph.D. in Computer Science *Pittsburgh, PA, USA*
Co-advised by Zico Kolter and Pradeep Ravikumar
Research Focus: Machine Learning, Self-supervised Learning, Representation Learning, Generalization, Distribution Shift

Peking University *Sep 2016 - Jul 2020*
Bachelor of Science (double degree, with summa cum laude honor) *Beijing, China*
Majors: Computer Science, Applied Mathematics (Double major)
Member of PKU MOE Top-Notch Undergraduate Researcher Program, advised by Liwei Wang

Professional Experiences

Trexquant Investment LP (hedge fund) *May 2024 – Aug 2024*
Alpha Researcher Intern *Remote*

- Worked on machine learning algorithms for alpha combination

Amazon Alexa AI *May 2022 – Aug 2022*
Applied Scientist Intern. Mentors: Aram Galstyan, Anoop Kumar, Stefan Schroedl *Sunnyvale, CA, USA*

- Studied how to make the Alexa system robust against continuous data distribution shift.
- Paper: *Online Continual Learning for Progressive Distribution Shift (OCL-PDS): A Practitioner's Perspective*

Microsoft Research Asia (MSRA) *Sep 2019 – Jun 2020*
Research Intern, Machine Learning Group. Mentor: Di He *Beijing, China*

- Worked on quantitatively comparing deep representations. Awarded MSRA Award of Excellence
- Paper: *Transferred Discrepancy: Quantifying the Difference Between Representations*

UCLA *Jun 2019 – Sep 2019*
Research Assistant. Advisor: Cho-Jui Hsieh *Los Angeles, CA, USA*

- Proposed a method of training certifiably robust models against adversarial attack
- Paper: *MACER: Attack-free and Scalable Robust Training via Maximizing Certified Radius*

Publications

Refereed Conference and Journal Publications

[1] **Runtian Zhai**, Bingbin Liu, Andrej Risteski, Zico Kolter, Pradeep Ravikumar
Understanding Augmentation-based Self-Supervised Representation Learning via RKHS Approximation and Regression
International Conference on Learning Representations, **(ICLR 2024 Spotlight)**

[2] **Runtian Zhai**, Rattana Pukdee, Roger Jin, Maria-Florina Balcan, Pradeep Ravikumar
Spectrally Transformed Kernel Regression
International Conference on Learning Representations, **(ICLR 2024 Spotlight)**

[3] **Runtian Zhai**, Bingbin Liu, Andrej Risteski, Zico Kolter, Pradeep Ravikumar
Augmentation Alone Leads to Generalization
International Conference on Learning Representations Workshop on Reliable and Responsible Foundation Models, **(ICLR 2023 R2FM Workshop)**

[4] Yuzhe Lu, Yilong Qin, **Runtian Zhai**, Andrew Shen, Ketong Chen, Zhenlin Wang, Soheil Kolouri, Simon Stepputtis, Joseph Campbell, Katia P. Sycara
Characterizing Out-of-Distribution Error via Optimal Transport
Neural Information Processing Systems, **(NeurIPS 2023)**

[5] Yash Gupta, **Runtian Zhai**, Arun Suggala, Pradeep Ravikumar
Responsible AI (RAI) Games and Ensembles
Neural Information Processing Systems, **(NeurIPS 2023)**

[6] **Runtian Zhai**, Chen Dan, Zico Kolter, Pradeep Ravikumar
Understanding Why Generalized Reweighting Does Not Improve Over ERM
International Conference on Learning Representations, **(ICLR 2023)**

[7] **Runtian Zhai**, Stefan Schroel, Aram Galstyan, Anoop Kumar, Greg Ver Steeg, Pradeep Natarajan
Online Continual Learning for Progressive Distribution Shift (OCL-PDS): A Practitioner's Perspective
International Conference on Learning Representations Workshop on Domain Generalization, **(ICLR 2023 DG Workshop)**

[8] Yuzhe Lu, Zhenlin Wang, **Runtian Zhai**, Soheil Kolouri, Joseph Campbell, Katia P. Sycara
Predicting Out-of-Distribution Error with Confidence Optimal Transport
International Conference on Learning Representations Workshop on Trustworthy Machine Learning, **(ICLR 2023 Trustworthy ML Workshop)**

[9] **Runtian Zhai**, Chen Dan, Arun Sai Suggala, Zico Kolter, Pradeep Ravikumar
Boosted CVaR Classification
Neural Information Processing Systems, **(NeurIPS 2021)**

[10] **Runtian Zhai***, Chen Dan*, Zico Kolter, Pradeep Ravikumar
DORO: Distributional and Outlier Robust Optimization
International Conference on Machine Learning, **(ICML 2021)**

[11] **Runtian Zhai***, Chen Dan*, Di He*, Huan Zhang, Liwei Wang, Pradeep Ravikumar, Boqing Gong, Cho-Jui Hsieh
MACER: Attack-free and Scalable Robust Training via Maximizing Certified Radius
International Conference on Learning Representations, **(ICLR 2020)**

Preprints

[1] Yunzhen Feng*, **Runtian Zhai***, Di He, Liwei Wang, Bin Dong
Transferred Discrepancy: Quantifying the Difference Between Representations
arXiv preprint, arXiv:2007.12446

[2] **Runtian Zhai***, Tianle Cai*, Di He*, Chen Dan, Kun He, John E. Hopcroft, Liwei Wang
Adversarially Robust Generalization Just Requires More Unlabeled Data
arXiv preprint, arXiv:1906.00555

Teaching

CMU 15-750: Algorithms in the Real World *Fall 2024*

- Assignments and exams preparation, office hours

CMU 10-701: Introduction to Machine Learning *Fall 2022*

- **Head TA**: Assignments, recitals and exams preparation, project mentoring, office hours
- One mentored project converted into a NeurIPS publication [4]

Professional Activities

Journal Reviewer

- Journal of Machine Learning Research (JMLR)
- Nature Communications

Conference Reviewer

- International Conference on Learning Representations (ICLR) *2023-2025*
- Neural Information Processing Systems (NeurIPS) *2022-2024*
- International Conference on Machine Learning (ICML) *2022-2024*
- International Conference on Artificial Intelligence and Statistics (AISTATS) *2023-2024*
- ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD) *2023-2025*
- Association for the Advancement of Artificial Intelligence (AAAI) *2025*
- SIAM International Conference on Data Mining (SDM) *2024*
- International Conference on Computer Vision (ICCV) *2023*
- European Conference on Computer Vision (ECCV) *2024*
- Asian Conference on Computer Vision (ACCV) *2024*