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Liam Collins

Education

2019 – **The University of Texas at Austin**, Austin, TX
Ph. D. Student, Electrical and Computer Engineering
Advisors: Dr. Aryan Mokhtari & Dr. Sanjay Shakkottai
Research: Federated learning, Meta-learning, Multi-task learning

2015 – 2019 **Princeton University**, Princeton, NJ
B.S.E., Electrical Engineering, Magna Cum Laude
Certificates: Statistics and Machine Learning, Applications of Computer Science
Senior Thesis: Nonnegative Matrix Factorization: An Empirical Analysis, advised by Dr. Yuxin Chen

Publications

NeurIPS 2022 **Liam Collins**, Hamed Hassani, Aryan Mokhtari, Sanjay Shakkottai. 2022. FedAvg with Fine Tuning: Local Updates Lead to Representation Learning. In *Neural Information Processing Systems* (NeurIPS 2022).

ICML 2022 **Liam Collins**, Aryan Mokhtari, Sewoong Oh, Sanjay Shakkottai. 2022. MAML and ANIL Provably Learn Representations. In *International Conference on Machine Learning* (ICML 2022).

CoLLAs 2022 **Liam Collins**, Aryan Mokhtari, Sanjay Shakkottai. 2020. How Does the Task Landscape Affect MAML Performance?. In *Conference on Lifelong Learning Agents* (CoLLAs 2022). *Oral presentation.*

ICML 2021 **Liam Collins**, Hamed Hassani, Aryan Mokhtari, Sanjay Shakkottai. 2021. Exploiting Shared Representations for Personalized Federated Learning. In *International Conference on Machine Learning* (ICML 2021).

NeurIPS 2020 **Liam Collins**, Aryan Mokhtari, Sanjay Shakkottai. 2020. Task-Robust Model-Agnostic Meta-Learning. In *Advances in Neural Information Processing Systems* (NeurIPS 2020).

Work Experience

Summer 2022 **Amazon Alexa**, *Applied Science Intern*, Cambridge, MA, United States.
Project: Personalized federated learning with side information.

Summer 2018, 2019 **Massachusetts Institute of Technology Lincoln Laboratory**, *Research Intern*, Advanced RF Techniques and Systems Group, Lexington, MA, United States.
Projects: Beamforming with deep modulation classifier, Submodular antenna placement, Covariance estimation.

Summer 2017 **Ruhr Universität Bochum**, *Research Intern*, Bochum, Germany.
Project: Antenna insertion into FPGA.

Summer 2016 **Parametric Technology Coorporation**, *Strategy Intern*, Needham, MA.

Teaching

UT Austin Fall 2019, Spring 2020: Data Science Lab - Teaching Assistant

Princeton University Spring 2019: ELE 302 Car Lab - Teaching Assistant
Fall 2017, 2018: ELE 306 Contemporary Logic Design - Teaching Assistant
2016-2019: MAT 201 Multivariable Calculus - McGraw Center Peer Tutor
2016-2019: MAT 202 Linear Algebra - McGraw Center Peer Tutor

Talks

2022 Representation Learning in Federated Learning
- *Federated Learning One World (FLOW) Seminar*, Virtual, 10/22

2022 MAML and ANIL Provably Learn Representations
- *ICML 2022*, Baltimore, MD, 7/21

2021 Exploiting Shared Representations for Personalized Federated Learning
- *CISS 2022*, Virtual, 3/10
- *INFORMS Annual Meeting 2021*, Anaheim, CA, 10/21
- *Modeling and Optimization: Theory and Applications* (MOPTA), Virtual, 8/21
- *International Conference on Machine Learning* (ICML), Virtual, 7/21

2020 Task-Robust Model-Agnostic Meta-Learning
- *Neural Information Processing Systems* (NeurIPS), Virtual, 12/20

Service

2021, 2022 NeurIPS: Reviewer (2021 Outstanding Reviewer Award, top 8% of reviewers)

2021, 2022 ICML: Reviewer (2022 Outstanding Reviewer Award, top 10% of reviewers)

2021 AISTATS: Reviewer

Awards and Honors

2019,2022 University of Texas at Austin Engineering Fellowship (UT Austin)

2019 G. David Forney Jr. Prize for Senior Thesis (Princeton University)

2019 Phi Beta Kappa, Sigma Xi, Tau Beta Pi Honor Societies (Princeton University)

Skills

Programming Python, PyTorch, Tensorflow