Ajay Jain

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Education

University of California, Berkeley BERKELEY
Ph.D. in Computer Science Jun 2019 – May 2024 (expected)

- Advised by Prof. Pieter Abbeel in Berkeley AI Research lab.
- Awarded NSF Graduate Research Fellowship.
- How can machines automatically recognize, reconstruct, and generate the structure within raw data? Research on generative models, unsupervised learning, and deep learning. Additional interests in systems. Published at NeurIPS, UAI, and MLSys.

Massachusetts Institute of Technology CAMBRIDGE
B.S. in Computer Science and Engineering (Course 6-3) Aug 2016 – May 2019

- Research on auto-vectorizing compilers and learned compilers, advised by Prof. Saman Amarasinghe. Published at Compiler Construction, and workshops at ISCA and ICML.
- President, Machine Intelligence Community. Led reading groups, classes.
- Organizer, HackMIT.
- *Undergraduate GPA:* 5.0/5.0

Experience

Uber ATG TORONTO
Research Intern, Toronto R&D team. Advised by Prof. Raquel Urtasun. Jun 2018 – Jan 2019

- Accurate forecasts of vehicle & pedestrian behaviors are critical for safe self-driving. Published Discrete Residual Flow, a deep, tractable generative model that predicts future actor behavior at CoRL 2019. Our trajectory joint distribution is multi-modal and efficiently marginalizable, allowing uncertainty-aware, cost-based planning.

Facebook MENLO PARK
Software Engineering Intern, Applied Machine Learning team May 2017 – Sep 2017

- Trained fast facial expression recognition models for core FB app mobile videos.

Kensho Technologies CAMBRIDGE
Software Engineering Intern Jan 2017 – Feb 2017

- Early intern at startup later acquired by S&P Global. Populated knowledge graph from news articles through named entity recognition. Added geographic regions that match hundreds of thousands of previously unknown entity instances.

Juniper Networks SUNNYVALE
Software Engineering Intern Jun 2016 – Aug 2016

- Worked on data engineering and natural language processing. Wrote support ticket routing system with many-class text classification pipeline.

Research

Conference publications

[*] Denotes equal contribution

NeurIPS 2020 Jonathan Ho, **Ajay Jain**, Pieter Abbeel. Denoising Diffusion Probabilistic Models. *Conference on Neural Information Processing Systems*, 2020.

NeurIPS 2020 Michael Laskin[*], Scott Emmons[*], **Ajay Jain**[*], Thanard Kurutach, Pieter Abbeel, Deepak Pathak. Sparse Graphical Memory for Robust Planning. *Conference on Neural Information Processing Systems*, 2020.

UAI 2020 **Ajay Jain**, Pieter Abbeel, Deepak Pathak. Locally Masked Convolution for Autoregressive Models. *Conference on Uncertainty in AI*, 2020.

MLSys 2020 Paras Jain[*], **Ajay Jain**[*], Aniruddha Nrusimha, Amir Gholami, Pieter Abbeel, Kurt Keutzer, Ion Stoica, Joseph E. Gonzalez. Checkmate: Breaking the Memory Wall with Optimal Tensor Rematerialization. *Conference on Machine Learning and Systems*, 2020.

CoRL 2019 **Ajay Jain**[*], Sergio Casas Romero[*], Renjie Liao[*], Yuwen Xiong[*], Song Feng, Sean Segal, Raquel Urtasun. Discrete Residual Flow for Probabilistic Pedestrian Behavior Prediction. *Conference on Robot Learning*, 2019.

CC 2019 Charith Mendis[*], **Ajay Jain**[*], Paras Jain and Saman Amarasinghe. Revec: Program Rejuvenation through Revectorization. *International Conference on Compiler Construction*, 2019.

OCEANS 2017 C Mirabito, DN Subramani, T Lolla, PJ Haley, **A Jain**, PFJ Lermusiaux, C Li, DKP Yue, Y Liu, FS Hover, N Pulsone, J Edwards, KE Railey, G Shaw. Autonomy for Surface Ship Interception. *IEEE OCEANS–Aberdeen*, 2017.

Preprints

arXiv 2020 Paras Jain*, **Ajay Jain***, Pieter Abbeel, Joseph E Gonzalez, Ion Stoica. Contrastive Code Representation Learning. *arXiv*, 2020.

arXiv 2019 Paras Jain, Xiangxi Mo, **Ajay Jain**, Alexey Tumanov, Joseph E Gonzalez, Ion Stoica. The OoO VLIW JIT Compiler for GPU Inference. *arXiv*, 2019.

arXiv 2018 Anand Srinivasan, **Ajay Jain**, Parnian Barekatain. An Analysis of the Delayed Gradients Problem in Asynchronous SGD. 2018.

Workshop papers

ISCA 2019 **Ajay Jain**, Saman Amarasinghe. Learning Automatic Schedulers with Projective Reparameterization. *ML for Sys. at Intl. Symposium on Computer Architecture*, 2019.

ICML 2019 Kavya Ravichandran, **Ajay Jain**, Alexander Rakhlin. Using Effective Dimension to Analyze Feature Transformations in Deep Neural Networks. *Identifying and Understanding DL Phenomena at Intl. Conference on Machine Learning*, 2019.

NeurIPS 2018 Paras Jain, Xiangxi Mo, **Ajay Jain**, Harikaran Subbaraj, Rehan Durrani, Alexey Tumanov, Joseph Gonzalez, Ion Stoica. Dynamic Space-Time Scheduling for GPU Inference. *LearningSys at Neural Information Processing Systems*, 2018.