Ajay Jain

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Education

University of California, Berkeley BERKELEY
Ph.D. in Computer Science Jun 2019 – May 2023
M.S. in Computer Science Jun 2019 – May 2021

- Awarded NSF Graduate Research Fellowship.
- Advised by Prof. Pieter Abbeel in the Berkeley AI Research lab.
- I work on machine learning systems that supercharge creative applications of AI like image, text and 3D synthesis. I'm particularly interested in generative models, self-supervised representation learning, computer vision, and 3D vision.
- Published at CVPR, EMNLP, ICCV, NeurIPS, UAI, MLSys, CoRL.
- *GPA:* 3.96/4.00

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

- President of AI club (MIT Machine Intelligence Community). Researched auto-vectorizing, learned compilers with Prof. Saman Amarasinghe.
- Papers at NeurIPS, ISCA, ICML workshops, Compiler Construction.
- *Undergraduate GPA:* 5.0/5.0

Experience

Google Brain SAN FRANCISCO
Student Researcher May 2021 – April 2022

- Researching diffusion models and generative neural radiance fields for 3D object design on the GenMo team. I collaborated with Ben Poole, Jon Barron, Ben Mildenhall.

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

- Accurate forecasts of pedestrian behaviors are critical for safe self-driving. Published Discrete Residual Flow, a deep generative model that predicts multi-modal behaviors.

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, matching 100K+ unknown phrases.

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

CVPR 2022 **Ajay Jain**, Ben Mildenhall, Jon Barron, Pieter Abbeel, Ben Poole. Zero-Shot Text-Guided Object Generation with Dream Fields. *Computer Vision and Pattern Recognition*, 2022.

EMNLP 2021 Paras Jain*, **Ajay Jain***, Pieter Abbeel, Joseph E Gonzalez, Ion Stoica. Contrastive Code Representation Learning. *Conference on Empirical Methods in Natural Language Processing*, 2021.

ICCV 2021 **Ajay Jain**, Matthew Tancik, Pieter Abbeel. Putting NeRF on a Diet: Semantically Consistent Few-Shot View Synthesis. *International Conference on Computer Vision*, 2021.

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

NeurIPS 2020 Scott Emmons*, **Ajay Jain***, Michael Laskin*, 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

In submission Qiyang Li, **Ajay Jain**, Pieter Abbeel. AdaCat: Adaptive Categorical Discretization for Autoregressive Models. *In submission*, 2022.

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.

Workshop papers

ISCA 2019 **Ajay Jain**, Saman Amarasinghe. Learning Automatic Schedulers with Projective Reparameterization. *ML for Systems at International 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.

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