Archit Sharma

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Education

Stanford University
PhD in Computer Science, ***Advisor****: Chelsea Finn* — *Jan' 21 – Present*

IIT Kanpur
B.Tech in Electrical Engineering, GPA: 9.9/10 — *Jul' 14 – Jun' 18*
Minors: Machine Learning, Linguistics

Experience

Toyota Research Institute — **Los Altos, CA**
Research Intern — *Jun' 23 – Sep' 23*
Fine-tuning large language models.

Google — **Mountain View, CA**
AI Resident — *Jul' 18 – Dec' 20*
Deep reinforcement learning.

IIT Kanpur — **Kanpur, India**
Undergraduate Researcher, Supervisor: Piyush Rai — *Aug' 17 – Apr' 18*
Expectation maximization algorithms for mixture-of-experts.

Mila - Quebec Artificial Intelligence Institute — **Montreal, QC, Canada**
Research Intern, Supervisor: Yoshua Bengio — *May' 17 – Aug' 17*
Gradient estimation across discrete latent variables in deep neural networks.

Articles

Lucy Xiaoyang Shi*, **Archit Sharma***, Tony Z. Zhao, and Chelsea Finn. *Waypoint-Based Imitation Learning for Robotic Manipulation*. Conference on Robot Learning (CoRL), 2023.

Archit Sharma, Ahmed Ahmed, Rehaan Ahmad, and Chelsea Finn. *Self-Improving Robots: End-to-End Autonomous Visuomotor Reinforcement Learning*. Conference on Robot Learning (CoRL), 2023.

Rafael Rafailov*, **Archit Sharma***, Eric Mitchell*, Stefano Ermon, Christopher D. Manning, and Chelsea Finn. *Direct Preference Optimization: You Language Model is Secretly a Reward Model*. Neural Information Processing Symposium (NeurIPS), 2023 (Oral Presentation, <2% rate).

Katherine Tian, Eric Mitchell, Allan Zhou, **Archit Sharma**, Rafael Rafailov, Huaxiu Yao, Chelsea Finn, and Christopher D. Manning. *Just Ask for Calibration: Strategies for Eliciting Calibrated Confidence Scores from Language Models Fine-Tuned with Human Feedback*. (*under review*) Empirical Methods in Natural Language Processing (EMNLP), 2023.

Annie Chen, **Archit Sharma**, Sergey Levine, and Chelsea Finn. *You Only Live Once: Single-Life Reinforcement Learning via Reward Shaping*. Neural Information Processing Systems (NeurIPS), 2022. `https://openreview.net/forum?id=303XqIQ5c_d`.

Annie Xie*, Fahim Tajwar*, **Archit Sharma***, and Chelsea Finn. *When to Ask for Help: Proactive Interventions in Autonomous Reinforcement Learning*. Neural Information Processing Systems (NeurIPS), 2022. https://openreview.net/forum?id=L9EXtg7h6XE.

Archit Sharma*, Rehaan Ahmad*, and Chelsea Finn. *A State-Distribution Matching Approach to Non-Episodic Reinforcement Learning*. International Conference on Machine Learning (ICML), 2022. https://proceedings.mlr.press/v162/sharma22a.html.

Archit Sharma*, Kelvin Xu*, Nikhil Sardana, Karol Hausman, Sergey Levine, and Chelsea Finn. *Autonomous Reinforcement Learning: Formalism and Benchmarking*. International Conference on Learning Representations (ICLR), 2022. https://openreview.net/forum?id=nkaba3ND7B5.

Archit Sharma, Abhishek Gupta, Sergey Levine, Karol Hausman, and Chelsea Finn. *Autonomous Reinforcement Learning via Subgoal Curricula*. Neural Information Processing Systems (NeurIPS), 2021. https://openreview.net/forum?id=ELU8Bu1Z9w1.

Behzad Haghgoo*, Allan Zhou*, **Archit Sharma**, and Chelsea Finn. *Discriminator Augmented Model-based Reinforcement Learning*. Deep RL Workshop, NeurIPS, 2021. https://openreview.net/forum?id=mhsaUIrsHZs.

Jongwook Choi, **Archit Sharma**, Sergey Levine, Honglak Lee, and Shixiang Gu. *Variational Empowerment as Representation Learning for Goal-Conditioned Reinforcement Learning*. International Conference on Machine Learning (ICML), 2021. https://proceedings.mlr.press/v139/choi21b.html.

Archit Sharma, Michael Ahn, Sergey Levine, Vikash Kumar, Karol Hausman, and Shixiang Gu. *Emergent Real-World Robotic Skills via Unsupervised Off-Policy Reinforcement Learning*. Robotics: Science and Systems (RSS), 2020. http://www.roboticsproceedings.org/rss16/p053.html.

Archit Sharma, Shixiang Gu, Sergey Levine, Vikash Kumar, and Karol Hausman. *Dynamics-Aware Unsupervised Discovery of Skills*. International Conference on Learning Representations (ICLR), 2020 (Oral Presentation, <2% rate). https://openreview.net/forum?id=HJgLZR4KvH.

Archit Sharma*, Siddhartha Saxena*, and Piyush Rai. *A flexible probabilistic framework for large-margin mixture of experts*. Machine Learning (2019) 108: 1369, 2019. https://link.springer.com/article/10.1007/s10994-019-05811-4.

Honors

General Proficiency Medal 2018
Graduating with the highest GPA among EE graduates at IIT Kanpur.

Motorola Gold Medal 2018
Overall achievement among CS/EE graduates at IIT Kanpur.

Proficiency Prize 2018
Outstanding Undergraduate Research at IIT Kanpur.

Lalit Narain Das Memorial Scholarship 2018
Best Senior Student in Electrical Engineering, IIT Kanpur

Sri Singhasan Singh Scholarship 2017
Highest GPA in Electrical Engineering, IIT Kanpur

Academic Excellence Award 2015, 2016, 2017
Equivalent to Dean's list at IIT Kanpur.

Joint Entrance Examination 2014
All India Rank 376 out of 150,000 students.

National Talent Search Scholarship (NTSE) 2010
Awarded to 1000 students by Govt. of India.

Miscellaneous

Reviewing: ICLR, NeurIPS, ICRA, CoRL

Mentorship: (*Stanford* undergraduate/MS students) Nikhil Sardana, Rehaan Ahmad, Leo Dong, Fahim Tajwar, Ahmed Ahmed, Sergio Charles, Max Sobol Mark, Lucy Shi

Talks:
- *Beyond RLHF: Simple, Principled and Efficient Fine-tuning LMs on Human Preferences using DPO*: DeepMind, Toyota Research Institute,
- *Dynamics-Aware Unsupervised Discovery of Skills*: Oral Presentation at ICLR 2020, Task-agnostic Reinforcement Learning at ICLR 2019 and, Stanford University
- *Autonomous Reinforcement Learning: Formalism, Algorithms and Benchmarking*: Intel
- *Towards Autonomous Learning Agents: Challenges and Opportunities in Non-Episodic RL*: IMPAN RL Seminar
- *On Unsupervised and Autonomous Reinforcement Learning*: Generally Intelligent Podcast

Entry on Google AI Blog: Unsupervised Reinforcement Learning for Skill Discovery

Entry on Stanford AI Laboratory Blog: Self-Improving Robots: Embracing Autonomy in Robot Learning

Teaching: (TA, *Stanford*) CS330: Deep Multi-task and Meta-Learning, (Research mentorship at *IIT Kanpur*) CS698X: Topics in Probabilistic Modeling and Inference