Anikait Singh

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Education

Stanford University *Palo Alto, CA*

PhD in Computer Science Sept. 2023 - Present

Advisor: Professor Chelsea Finn
Close Collaborators: Professor Aviral Kumar, Professor Tatsunori Hashimoto

Research Focus: Methods for decision making that are able to leverage diverse data sources and enable scaling.

University of California, Berkeley *Berkeley, CA*

Bachelor of Arts in Computer Science Aug. 2019 - May. 2023

GPA: 3.986, **Technical GPA:** 4.0 Highest Distinction in General Scholarship

Selected Coursework: Machine Learning, Deep Learning, Deep Reinforcement Learning, AI, Probability/Random Processes, Convex Optimization, Natural Language Processing, Information Theory, Graduate Probability Theory, Speech Recognition

Organizations: UPE, UCB Sikh Student Association, Berkeley Legends

Publications

[1] **Preference Fine-Tuning of LLMs Should Leverage Suboptimal, On-Policy Data** [Paper] [Website]
Anikait Singh*, Fahim Tajwar*, Archit Sharma, Rafael Rafailov, Jeff Schneider,
Tengyang Xie, Stefano Ermon, Chelsea Finn, Aviral Kumar
International Conference on Machine Learning (ICML), 2024

[2] **D5RL: Diverse Datasets for Data-Driven Deep Reinforcement Learning**
Rafael Rafailov*, Kyle Beltran Hatch*, **Anikait Singh**, Aviral Kumar, Laura Smith,
Ilya Kostrikov, Philippe Hansen-Estruch, Victor Kolev, Philip J. Ball, Jiajun Wu,
Sergey Levine, Chelsea Finn
Reinforcement Learning Conference (RLC), 2024

[3] **Robotic Offline RL from Internet Videos via Value-Function Pre-Training** [Paper]
Chethan Bhateja*, Derek Guo*, Dibya Ghosh*, **Anikait Singh**, Manan Tomar, Quan Vuong,
Yevgen Chebotar, Sergey Levine, Aviral Kumar

[4] **Open X-Embodiment: Robotic Learning Datasets and RT-X Models** [Paper]
Open X-Embodiment Collaboration
IEEE International Conference on Robotics and Automation (ICRA), 2024.

[5] **RT-2: Vision-Language-Action Models Transfer Web Knowledge to Robotic Control** [Paper]
Google DeepMind Robotics
Conference on Robot Learning (CoRL), 2023.

[6] **Offline RL With Realistic Datasets: Heteroskedasticity and Support Constraints** [Paper]
Anikait Singh*, Aviral Kumar*, Quan Vuong, Yevgen Chebotar, Sergey Levine
Conference on Neural Information Processing Systems (NeurIPS), 2023

[7] **Cal-QL: Calibrated Offline RL Pre-Training for Efficient Online Fine-Tuning** [Paper]
Mitsuhiko Nakamoto*, Yuexiang Zhai*, **Anikait Singh**, Yi Ma, Chelsea Finn, Aviral Kumar, Sergey Levine
Conference on Neural Information Processing Systems (NeurIPS), 2023

[8] **Pre-Training for Robots: Offline RL Enables Learning New Tasks from a Handful of Trials** [Paper]
Aviral Kumar*, **Anikait Singh***, Frederik Ebert*, Yanlai Yang, Chelsea Finn, Sergey Levine
Robotic Science and Systems (RSS), 2023 *(Acceptance rate: 20.6%)*

[9] **Should I Run Offline Reinforcement Learning or Behavioral Cloning?** [Paper] [Blog]
Aviral Kumar*, Joey Hong*, **Anikait Singh**, Sergey Levine
International Conference on Learning Representations (ICLR), 2022.

[10] **A Workflow for Offline Model-Free Robotic Reinforcement Learning** [Paper] [Talk]
Aviral Kumar*, **Anikait Singh***, Stephen Tian, Chelsea Finn, Sergey Levine
Conference on Robot Learning (CoRL), 2021 (***Oral*** Presentation). *(Acceptance rate: 6.5%)*

[11] **A Mobile Application for Keyword Search in Real-World Scenes** [Paper]
Shrinivas Pundlik*, **Anikait Singh***, Gautam Baghel, Vilte Baliutaviciute, Gang Luo
IEEE Journal of Translational Engineering in Health and Medicine (IEEE), 2019.

Preprints

[1] **Improving Test-Time Search with Backtracking Against In-Context Value Verifiers**
Anikait Singh, Kushal Arora, Sedrick Keh, Jean Mercat, Tatsu Hashimoto, Chelsea Finn, Aviral Kumar
In Submission to International Conference on Machine Learning (ICML), 2025

[2] **Few-Shot Preference Optimization of Synthetic Data in LLMs Elicits Effective Personalization** [Paper] [Website]
Anikait Singh*, Sheryl Hsu*, Kyle Hsu, Eric Mitchell, Stefano Ermon, Tatsu Hashimoto, Archit Sharma*, Chelsea Finn*
In Submission to Association for Computational Linguistics (ACL), 2025

[3] **Personalized Preference Fine-tuning of Diffusion Models** [Paper]
Meihua Dang*, **Anikait Singh***, Linqi Zhou, Stefano Ermon, Jiaming Song
In Submission to the Conference on Computer Vision and Pattern Recognition (CVPR), 2025

[4] **Adaptive Inference-Time Compute: LLMs Can Predict if They Can Do Better, Even Mid-Generation**
Rohin Manvi, **Anikait Singh**, Stefano Ermon
In Submission to International Conference on Machine Learning (ICML), 2025

[5] **Test-Time Alignment via Hypothesis Reweighting**
Yoonho Lee, Jonathan Williams, Henrik Marklund, Archit Sharma, Eric Mitchell, **Anikait Singh**, Chelsea Finn
In Submission to International Conference on Learning Representations (ICLR), 2025

Experience

Toyota Research Institute (TRI) *Los Altos, CA*

Mentor: Kushal Arora, Sedrick Keh and Jean Mercat June 2024 - Sept. 2024

- LLMs and VLMs are vital for tasks like coding, mathematics, and robotic planning, utilizing multi-step reasoning to decompose and solve complex problems accurately.
- Developed a value function verifier to estimate progress in a reasoning problem, enabling accurate credit assignment across substeps and improving policy performance through lower variance estimates.
- Empirically studied this approach in both pure language and multimodal domains

Google DeepMind Robotics *Mountain View, CA*

Mentor: Quan Vuong and Jialin Wu Apr. 2023 - February 2024

- Worked on learning vision-language-action models that leverage internet scale data to boost generalization and enable emergent semantic reasoning for robotic manipulation.
- Trained models to enable better few-shot (in-context) learning to allow for better generalization to new objects, skills, and embodiments. Utilized Retrieval as an approach to automatically construct shots to prompt new behaviors.
- Empirically studied how PeFT methods can be leveraged to enable efficient adaptation of pre-trained VLMS.

X, the moonshot factory *Mountain View, CA*

Mentor: Lam Nyguen and Grace Brentano Dec. 2022 - Apr. 2023

- Worked on an early-stage project looking at using Reinforcement Learning for Supply Chain Management.
- Devised methods to represent high-dimensional action spaces to make decision-making in these settings easier and more efficient.
- Collaborated with partners such as Uniqlo/Fast Retailing to understand how their retail company is structured and how methods can be developed for them to have better inventory management.

Teaching Experience/Mentorship

Deep Learning Portal	Program Coordinator, Mentor, 2024
CS 285: Deep Reinforcement Learning	Teaching Assistant: Fall 2022, Fall 2023
CS 188: Intro to AI	Teaching Assistant: Spring 2022
CS 61B: Data Structures and Algorithms	Deep Dive Instructor: Fall 2022

Awards and Honors

2023-2028	**NSF Graduate Fellowship**: Stanford University
2022	**CRA Outstanding Undergraduate Researcher Award Finalist**: UC Berkeley
2019 - 2023	**Dean's List**: UC Berkeley

Technical Skills

Programming	Python, Java, C
Frameworks	PyTorch, JAX, TensorFlow, Docker, NumPy
Languages	English(Native), Hindi, Punjabi, Spanish
Misc	Office, LaTeX