Anikait Singh

anikait@stanford.edu | http://asap7772.github.io/ | asap7772 | @Anikait_Singh_

Education

Stanford University *Palo Alto, CA*

PhD in Computer Science Sept. 2023 - Present

Rotation Advisors: Professor Chelsea Finn, Professor Stefano Ermon, 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 the Efficiency of Test-Time Search in LLMs with Backtracking**
Anikait Singh, Kushal Arora, Sedrick Keh, Jean Mercat, Tatsunori Hashimoto, Chelsea Finn, Aviral Kumar
In Submission to International Conference on Learning Representations (ICLR), 2025

[2] **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 Learning Representations (ICLR), 2025

[3] **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

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
2020 - 2023	**UPE**: UC Berkeley CS Honors Society
2019-2020	**SkyDeck Hotdesk Incubator**: Berkeley SkyDeck Fund
2019	**CalHacks 6.0 Fellowship**: UC Berkeley
Jan. 2020	**Apriorit Computer Science Scholarship**

Technical Skills

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