SIMRAN KAUR

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EDUCATION

Princeton University — Princeton, NJ
Ph.D. Candidate in Computer Science Department (Advisor: Sanjeev Arora). — 2022 - Present

Carnegie Mellon University — Pittsburgh, PA
B.S. Artificial Intelligence, School of Computer Science. — 2018-2022
GPA: 3.95/4.00

HONORS

CMU Senior Leadership Recognition Recipient — **May 2022**
Phi Beta Kappa — **May 2022**
CMU SCS College Honors (successful completion of senior thesis) — **May 2022**
Dean's List — **Spring 2019 – May 2022**

PUBLICATIONS

[1] *How does RL Post-Training Induce Skill Composition? A Case Study on Countdown* [Link]
Simon Park*, **Simran Kaur*,** Sanjeev Arora.
Spotlight at *Efficient Reasoning Workshop* (NeurIPS), 2025.
In *MATH-AI Workshop* (NeurIPS), 2025.

[2] *Instruct-SkillMix: A Powerful Pipeline for LLM Instruction Tuning* [Link]
Simran Kaur*, Simon Park*, Anirudh Goyal, Sanjeev Arora.
In *Proceedings of the 13th International Conference on Learning Representations* (ICLR), 2025.
Oral at *Compositional Learning Workshop* (NeurIPS), 2024.
In at *Compositional Learning Workshop* (NeurIPS), 2024.

[3] *Can Models Learn Skill Composition from Examples?* [Link]
Haoyu Zhao, **Simran Kaur**, Dingli Yu, Anirudh Goyal, Sanjeev Arora.
In *Advances in Neural Information Processing Systems* 37 (NeurIPS), 2024.

[4] *Skill-Mix: a Flexible and Expandable Family of Evaluations for AI models* [Link] [Quanta Article]
Dingli Yu, **Simran Kaur**, Arushi Gupta, Jonah Brown-Cohen, Anirudh Goyal, Sanjeev Arora.
In *Proceedings of the 12th International Conference on Learning Representations* (ICLR), 2024.
In *Workshop on Distribution Shifts* (NeurIPS), 2023.

[5] *Disentangling the Mechanisms behind Implicit Regularization in SGD* [Link]
Zachary Novack, **Simran Kaur**, Tanya Marwah, Saurabh Garg, Zachary C. Lipton.
In *Proceedings of the 11th International Conference on Learning Representations* (ICLR), 2023.
Spotlight in *Higher Order Optimization in Machine Learning Workshop* (NeurIPS), 2022. [Best Poster Award]

[6] *On the Maximum Hessian Eigenvalue and Generalization* [Link]
Simran Kaur, Jeremy Cohen, Zachary C. Lipton.
Contributed talk at *"I Can't Believe It's Not Better!" Workshop* (NeurIPS), 2022.

[7] *Gradient Descent on Neural Networks Typically Occurs at the Edge of Stability* [Link]
Jeremy M. Cohen, **Simran Kaur**, Yuanzhi Li, Zico Kolter, Ameet Talwalkar.
In *Proceedings of the 9th International Conference on Learning Representations* (ICLR), 2021.
In *Opt2020: 12th Annual Workshop on Optimization for Machine Learning* (NeurIPS), 2020.

[8] *Are Perceptually-Aligned Gradients a General Property of Robust Classifiers?* [Link]
Simran Kaur, Jeremy Cohen, Zachary C. Lipton.
In the *Science Meets Engineering of Deep Learning Workshop* (NeurIPS), 2019.

TEACHING

Princeton University

- Teaching Assistant for *COS 324: Introduction to Machine Learning.*
  Fall 2023 (for Junior Research Work), Spring 2024.

Carnegie Mellon University

- Teaching Assistant for *15281 Artificial Intelligence: Representation and Problem Solving*.
  Spring 2020, Fall 2020, Spring 2021 (Head TA), Fall 2021 (Head TA), Spring 2022 (Head TA)
- Teaching Assistant for *10301/10601 Introduction to Machine Learning* (Undergraduate and Graduate Level).
  Summer 2020.

SERVICE

- Conference Reviewing: NeurIPS, ICLR — **2023 – Present**
- Co-organizer for Princeton Algorithms & Machine Learning (Alg-ML) Seminar [Link] — **Fall 2023 – Spring 2024**
- Princeton Language and Intelligence (PLI) Blog Board Member [Link] — **Fall 2023 – Present**

SKILLS

Programming, Frameworks & Softwares: Python, C, Java, Standard ML, R, LaTeX, PyTorch, Matlab, Jupyter Notebook, Git