

# SIMRAN KAUR

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## EDUCATION

### Princeton University

Ph.D. student in Computer Science Department.

Princeton, NJ  
2022 - Present

### Carnegie Mellon University

B.S. Artificial Intelligence, School of Computer Science.

GPA: 3.95/4.00

Pittsburgh, PA  
2018-2022

Senior Thesis: "On the Dubious Relationship between Flatness and Generalization"  
Advised by Zachary Lipton.

## PUBLICATIONS

[1] *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 9<sup>th</sup> International Conference on Learning Representations (ICLR)*, 2021.

[2] *GD on Neural Networks Typically Occurs at the Edge of Stability* [\[Link\]](#)

Jeremy M. Cohen, **Simran Kaur**, Yuanzhi Li, Zico Kolter, Ameet Talwalkar. In *Opt2020: 12<sup>th</sup> Annual Workshop on Optimization for Machine Learning (NeurIPS)*, 2020.

[3] *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.

## EXPERIENCE

### RESEARCH ASSISTANT, ACMI LAB (CMU)

June 2019 – Aug 2022

- Investigated targeted adversarial attacks against a robust classifier trained under randomized smoothing
- Demonstrated that the behavior of gradient descent in non-convex settings is inconsistent with conventional optimization theory
- Currently investigating (i) why minibatch stochastic gradient descent generalizes better than full-batch gradient descent (GD) and (ii) the role of the train loss Hessian in the generalization ability of models trained via stochastic gradient descent (SGD) and full-batch gradient descent (GD) and (ii) why minibatch SGD generalizes better than GD

### RESEARCH INTERN, ABRIDGE INC

Summer 2021

- Used machine learning and NLP to extract and classify symptom mentions from doctor patient transcripts; working towards automating ROS section of SOAP Notes for doctors

## TEACHING

### Carnegie Mellon University

- Teaching Assistant for *15281 Artificial Intelligence: Representation and Problem Solving*.  
Spring 2020, Fall 2020, Spring 2021\*, Fall 2021\*, Spring 2022\*.  
Instructors: Stephanie Rosenthal, Patrick Virtue, Zico Kolter.  
\* - denotes semester serving as Head Teaching Assistant
- Teaching Assistant for *10301/10601 Introduction to Machine Learning* (Undergraduate and Graduate Level).  
Summer 2020.  
Instructors: Patrick Virtue.

## 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

## SKILLS

**Programming:** Python, C, Java, Standard ML, R, LaTeX

**Frameworks & Softwares:** PyTorch, Matlab, Jupyter Notebook, Git

## RELEVANT COURSEWORK

10-315 Machine Learning	15-281 Artificial Intelligence	11-485 Deep Learning
11-711 Algorithms for NLP	16-385 Computer Vision	36-218 Probability Theory
15-210 Parallel & Sequential Algorithms	15-251 Great Theoretical Ideas in CS	15-122 Data Structures & Algorithms
15-213 Computer Systems	15-150 Functional Programming	36-401 Modern Regression
10-725 Convex Optimization		

## HOBBIES

Running, painting, and baking biscotti