SIMRAN KAUR

B.S. Artificial Intelligence
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EDUCATION

CARNEGIE MELLON UNIVERSITY SCHOOL OF COMPUTER SCIENCE
B.S. ARTIFICIAL INTELLIGENCE
Pittsburgh, PA | Aug 2018 - May 2022

GPA: 3.93/4.0
Dean's List (Spring 2019 – present)

SKILLS:

Python • C • C0 • Java • PyTorch • Data Structures & Algorithms • Functional Programming (SML) • R • Parallel Programming • Machine Learning • Jupyter Notebook • Swift • Git • Latex

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

PRINCETON HIGH SCHOOL
(2014 – 2018)
Unweighted GPA: 3.99
Weighted GPA: 4.64

NEW JERSEY GOVERNOR'S SCHOOL IN THE SCIENCES (July 2017)
Intensive three-week summer program that brings the top 50 science high school students in NJ to take core courses and labs and partake in a team research project.

ORGANIZATIONS

WOMEN@SCS, CARNEGIE MELLON UNIVERSITY (2018 – Present)

CMU ALPHA PHI (Iota Sigma Chapter) (2019 – Present)

AI LOGO DESIGN COMMITTEE, CARNEGIE MELLON UNIVERSITY (2019 – 2020)

HOBBIES

Running
Painting
Baking biscotti

RESEARCH

ACMI LAB RESEARCH ASSISTANT, CARNEGIE MELLON UNIVERSITY (June 2019 – Present)

- NeurIPS 2019 Poster Presenter in Vancouver, Canada
- Paper accepted at Science Meets Engineering of Deep Learning Workshop
- arXiv link to paper: *Are Perceptually-Aligned Adversarial Attacks a General Property of Robust Classifiers?*

  Findings: Investigated targeted adversarial attacks against a robust classifier trained under randomized smoothing. Our research suggests perceptually-aligned gradients may be a general property of robust classifiers (not just adversarially trained classifiers).
- Researching how phenomena similar to perceptually-aligned gradients are realized differently between standard and adversarially trained CNNs through dataset characteristics

  Tech stack: Google Cloud Platform (GCP) GPU, ACMI Lab GPUs, ImageNet, Python
- Investigating the role of the train loss Hessian in the generalization ability of models trained via stochastic gradient descent and full-batch gradient descent

  Tech stack: ACMI Lab GPUs, Locus Lab GPUs, CIFAR10, FASHION MNIST, Python, Git

LOCUS LAB RESEARCH ASSISTANT, CARNEGIE MELLON UNIVERSITY (Summer 2020)

- Investigated gradient descent optimization in non-convex settings
- Implemented model frameworks to run experiments to investigate the relationship between learning rate and "sharpening" exhibited by the model's hessian's leading eigenvalue
- Work published as a conference paper at ICLR 2021 and accepted for Poster Presentation at NeurIPS 2020 Workshop

  Tech stack: Locus Lab GPUs, CIFAR10, Wikitext-2, MNIST, Python, Git

EXPERIENCE

RESEARCH INTERN, ABRIDGE INC (Summer 2021)

- Implementing model frameworks to run experiments to boost symptom classification performance based on doctor patient transcripts

HEAD TEACHING ASSISTANT – 15-281: AI REPRESENTATION AND PROBLEM SOLVING, CARNEGIE MELLON UNIVERSITY (Spring 2020, Fall 2020, Spring 2021, Fall 2021)

- Lead weekly 30 student recitation; develop assignments, recitations, and course notes; hold office hours
- Course Topics: Informed vs. Adversarial Search, Constraint Satisfaction Problems, Local Search, Optimization & Linear Programming, Propositional and First Order Logic, MDPs, Reinforcement Learning, Bayes Nets, HMMs, Particle Filtering, Game Theory, AI and Ethics

TEACHING ASSISTANT – 10-301 + 10-601: INTRODUCTION TO MACHINE LEARNING (Undergraduate and Graduate Level), CARNEGIE MELLON UNIVERSITY (Summer 2020)

- Lead weekly recitations, create assignments and recitations, and hold office hours
- Course Topics: Linear and Logistic Regression, Regularization, Neural Networks, Learning Theory, Decision Trees, Generative Models, Naïve Bayes, MLE vs. MAP, HMMs, MDPs, Clustering, Recommender Systems, Ensemble Methods

JANE STREET INSIGHT PROGRAM – SOFTWARE DEVELOPMENT TRACK (January 2020)

- Programmed Lumines game in OCaml; learned about relevant libraries and tools used every day at Jane Street and about the fundamentals of building electronic trading systems

GOLDMAN SACHS ENGINEERING ESSENTIALS PROGRAM (Summer 2020)

- Participated in trading games and attended talks detailing finance and engineering

ILAUNCH, FOUNDER AND VICE PRESIDENT (2016 – 2018)

- Founded incubator that helps launch apps developed by Princeton High School Students
- Captain of Gamethon; facilitated release of 15 apps to Apple App Store (2017)

AWARDS & LEADERSHIP

- Winning Team Member of BLOOMBERG BPuzzled: Race to New York at CMU (2019); participated in Global BPuzzled final competition in February 2020
- CMU Women@SCS Sisters Program Mentor
- Dean's List Spring 2019 - Present (with High Honors)