

Anirudh Cowlagi

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EDUCATION

University of Pennsylvania, Vagelos Integrated Program in Energy Research – Philadelphia, PA **GPA: 4.00/4.00** **May 2024**
B.S.E. in Electrical Engineering Minors: Computer Science, Data Science, Math
B.A. in Physics Concentrations: Computational Techniques, Robotics
M.S.E. in Robotics (Concentration: Artificial Intelligence & Machine Learning)

TECHNICAL SKILLS

Languages: Python, Java, C++, MATLAB, JavaScript, HTML5/CSS3, OCaml; **Tools/Frameworks:** PyTorch, TensorFlow/Keras, Scikit-Learn, OpenCV, React, Numpy, Altium, SolidWorks/Fusion, Git, Unix/Linux, Arduino/Raspberry Pi

RELEVANT COURSEWORK

Math: Multivariable/Vector Calculus, Ordinary/Partial Differential Equations, Linear Algebra, Introductory Analysis, [Math Research](#)
Physics: Mechanics, Electromagnetism, Statistical Physics & Thermodynamics, Quantum Mechanics; Analytical Mechanics
Electrical Engineering & Computer Science: Data Structures & Algorithms; Programming Languages & Techniques; Theory of Deep Learning; Control for Autonomous Robots; Discrete Mathematics; Electrical Circuits & Systems; Laboratory Electronics

TECHNICAL EXPERIENCE

[University of Pennsylvania, Electrical Engineering](#) | Undergraduate Researcher (VIPER) | Philadelphia, PA **May 2021 – Present**

- Understanding neural network representations by leveraging techniques from statistical physics and ensemble theory.
- Investigating Fisher Information to characterize the geometry of model manifolds and understand network overparameterization.
- Determine if data geometry induces capacity control in neural architecture, establish non-vacuous generalization bounds for *sloppy* models

[University of Pennsylvania, Computer & Information Science](#) | Teaching Assistant | Philadelphia, PA **January 2022-Present**

- Course: Data Structures & Algorithms; Course Size: 220+
- Roles/Responsibilities: Hold 1-hour weekly recitation; Grade student assignments; Answer questions and provide debugging assistance through office hours; Develop course content (problem sets, recitation guides)

[University of Michigan, Physics](#) | Data Analyst | Ann Arbor, MI **April 2019 – November 2020**

- Generalized line-detection algorithms, signal/image processing techniques to efficiently detect minor planets in tabular astrometric survey data using Python/MySQL.
- Identified, cataloged, and submitted detections of 500+ new objects and recovered 200+ previously discovered objects

[University of Michigan, Nuclear Engineering](#) | Research Assistant | Ann Arbor, MI **June 2019 – May 2020**

- Developed Python tools to characterize the lattice connectivity of semiconductor networks using Python (NetworkX, OpenCV)
- Applied image-processing techniques and elementary graph theory methods to automate analysis of 1000+ TEM images.

HONORS & ACTIVITIES

[36th AAAI Conference on Artificial Intelligence, Accepted Finalist Paper \(Student Abstract\)](#) **February 2022 -March 2022**

- Paper: Does the Geometry of the Data Control the Geometry of Neural Predictions? (Anirudh Cowlagi, Pratik Chaudhari) — see work above.
- 1 of 110+ accepted abstracts (23% acceptance rate), 1 of 20 selected as a finalist to participate in oral presentation contest

[Penn Electric Racing, Hardware, Software, & Autonomous Team](#) **January 2021 - Present**

- Designing, testing, and debugging a PCB to actively balance vehicle accumulator substacks (9 70V stacks) using custom balancing algorithm
- Working on cone perception, waypoint-based path planning/optimization for driverless capability (aim to be North America's first student-built autonomous race car)

[Wharton Undergraduate Data Analytics Club; AI@Penn \(Education Committee & Venture Fellows\)](#) **September 2020 - Present**

- Organized datathon at the University of Pennsylvania sponsored by fintech/e-commerce companies; Attracted 35+ universities; 100+ teams
- Designed and taught ML workshop on sentiment analysis to 30+ Penn undergraduate students
- Worked with a Philadelphia-based startup (Highlight) to develop a robust, efficient, and accurate system for product review helpfulness assignment with 90+% OOS accuracy

[Regeneron International Science and Engineering Fair, Science and Engineering Fair of Metro Detroit](#) **March 2018 - March 2020**

- Regeneron ISEF Finalist (top 1200 out of 7,000,000+ students); SEFMD Grand Award, Physics: Best of Category (top 5 out of 650+ projects)

LEADERSHIP & VOLUNTEER EXPERIENCE

[Introductory Problem-Solving in Physics](#) | Head Instructor | Ann Arbor, MI **April 2020 – July 2020**

- Created and taught course in introductory course in physics and problem solving to 20+ local middle school students
- Provided 18 interactive sessions and 10 hands-on problem sets with extensive feedback