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**
M.S.E. in Robotics (Concentration: Artificial Intelligence & Machine Learning)
B.S.E.. in Electrical Engineering Minors: Computer Science, Data Science, Math
B.A.. in Physics Concentrations: Computational Techniques, Robotics

TECHNICAL SKILLS

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

RELEVANT COURSEWORK

Math: Linear Algebra & Optimization, Introductory Analysis, Math Research, Multivariable Calculus, Ordinary/Partial Differential Equations
Physics: Mechanics, Electromagnetism, Statistical Physics & Thermodynamics, Quantum Mechanics; Analytical Mechanics
Electrical Engineering & Computer Science: Data Structures & Algorithms; Machine Learning; Theory of Deep Learning; Control for Autonomous Robots; Information Theory; Feedback Control; Electrical Circuits & Systems; Laboratory Electronics

TECHNICAL EXPERIENCE

University of Pennsylvania, Electrical Engineering | Undergraduate Researcher (VIPER) | Philadelphia, PA **May 2021 – Present**
- Understanding the efficacy of deep network representations by leveraging techniques from statistical physics and information theory
- Utilizing the Fisher Information to characterize the geometry of model manifolds and explain the *benign* overparameterization of networks
- Determine how training data structure induces capacity control in neural architectures; perform topology-preserving model reduction

University of Pennsylvania, Computer & Information Science | Teaching Assistant | Philadelphia, PA **January 2022-Present**
- Course: Data Structures & Algorithms, Machine Learning; Course Sizes: 220+
- Roles/Responsibilities: Developed course content on sublinear graph algorithms; Hold 1-hour weekly recitations; Grade student assignments; Answer questions and provide debugging assistance through office hours

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, catologged, 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 a Python toolkit to characterize the lattice connectivity of semiconductor networks (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 (FSAE), Hardware, Software, & Autonomous Team **January 2021 - Present**
- Designing, testing, and debugging accumulator management system to monitor and passively balance 8 55V battery substacks
- 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