Anirudh Cowlagi

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EDUCATION

University of Pennsylvania, *Vagelos Integrated Program in Energy Research* – Philadelphia, PA **May 2024**
M.S.E. in Robotics (Concentration: Artificial Intelligence & Machine Learning) (GPA 4.00 / 4.00)
B.S.E.. in Electrical Engineering (GPA 3.99 / 4.00)
B.A.. in Physics (GPA 4.00 / 4.00)

TECHNICAL EXPERIENCE

Citadel, Global Quantitative Strategies | Incoming Quantitative Research Analyst, Alternative Alpha | Miami, FL **July 2024**

Citadel, Global Quantitative Strategies | Quantitative Research Analyst Intern, Alternative Alpha | Chicago, IL **June 2023 - August 2023**
- Worked to evaluate and improve return forecasting models deriving from broker-side analyst estimate data. Identified and resolved systematic analyst coverage gaps across equities investment universe

University of Pennsylvania, Electrical Engineering | Undergraduate Researcher (VIPER) | Philadelphia, PA **May 2021 - Present**
- Exploring the geometry of deep network representations by leveraging techniques from statistical physics and information theory
- Developing model-agnostic approaches to select training examples that may accelerate and optimize training in the *continual learning* framework (10x reduction in replay set size)
- Determine how training data structure induces capacity control in neural architectures; perform topology-preserving model reduction (removing ~93% of redundant parameters)

University of Pennsylvania, Computer & Information Science | Teaching Assistant | Philadelphia, PA **January 2022 - Present**
- Courses: Data Structures & Algorithms, Machine Learning; Course Sizes: 220+ Roles/Responsibilities: Developed course content on sublinear time graph algorithms (estimating connected components); 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 existing line-detection algorithms (probabilistic Hough transform), signal processing techniques (Lomb-Scargle periodogram) to efficiently detect minor planets in sparse, tabular astrometric survey data (Dark Energy Survey). Record selection using Python/MySQL.
- Approach identified, catologged, and submitted detections of 500+ objects; recovered ephemerides of 200+ previously discovered objects

HONORS & ACTIVITIES

Citadel-Correlation One Data Open Championship / Summer Invitational **July-December 2022**
- 1st Place (Summer Invitational): Conducted an in-depth analysis of the risk assessment methodology employed by peer-peer lenders, using a modified nearest neighbors model. Employed momentum-based model to gauge and forecast lender reactivity to macro-scale borrower behavior. Prize: $10,000
- 3rd Place (Data Open Championship): Developed a robust methodology to improve the budgetary policy decisions of post-secondary institutions using a constrained optimization procedure on a low-dimensional manifold. 1 of 30 finalist teams selected from over 30,000 participants globally.

36th AAAI Conference on Artificial Intelligence, Published 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 (20% acceptance rate), 1 of 20 selected as “Best Student Paper” finalist

Penn Electric Racing (FSAE), Hardware, Software, & Autonomous Team **January 2021 - Present**
- Designed, tested, and debugged battery management system to monitor and passively balance 8 55V substacks using isoSPI protocol
- Developing Rust firmware to perform high-speed (15+ kHz) PID-based field-oriented control (FOC) through space-vector modulation (SVM) on custom-built 3-phase motor controllers. Hardware: STM32F777xx (MCU) accelerated with ECP5 (FPGA) for current sensing optimization

Wharton Undergraduate Data Analytics Club; **AI@Penn (Education Committee & Venture Fellows)** **September 2020 - Present**
- Aided a Philadelphia-based startup (Highlight) by leading the development of a robust and accurate model for automated product review helpfulness assignment with 90+% OOS accuracy
- Model Architecture: Shallow network with self-trained embedding layers, output chained with XGBoost regressor evaluating density of product specific content (using a original TF-IDF based metric)

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)

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 SKILLS

Languages: Python, Java, MATLAB, C++, OCaml; JavaScript, HTML5/CSS3 **Technologies/Frameworks:** PyTorch, TensorFlow/Keras, Scikit-Learn, Numpy, OpenCV, Altium, AWS EC2, React, SolidWorks/Fusion, Linux **Developer Tools:** Git, VSCode, IntelliJ, Eclipse