Arnav Garg

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Education

New York University May 2026
B.S., Applied Mathematics & Physics, Computer Science Minor (GPA: 3.88 / 4.00) *New York, NY*

- *Relevant Coursework:* Mathematics of Finance, Probability and Statistics, Linear Algebra and Differential Equations, Partial Differential Equations, Data Structures and Algorithms, Numerical Analysis, Honors Real Analysis, Linear and Nonlinear Optimization, Graduate Stochastic Calculus, Graduate Scientific Computing

Technical Skills

Languages: Python, Java, C++, MATLAB, SQL, R
Tools: Git/Github, Bash
Frameworks: PyTorch, TensorFlow, Qiskit, Cirq

Experience

NC State University, DRUMS Research Experience for Undergraduates May 2025 – Jul 2025
Applied Mathematics Researcher *Raleigh, NC*

- Designed and implemented MATLAB software to simulate five key EGaIn droplet operations under physical and geometric constraints, enabling prediction of droplet behavior for applications in soft robotics and electronics
- Devised a novel relationship between applied electric field and oxidation flux to enhance physical accuracy of governing lubrication model PDE, combining electric field effects with fluid dynamics via electrochemical oxidation
- Applied Keller Box finite differencing and Newton's iteration numerical methods to solve governing nonlinear lubrication model PDE for droplet dynamics and finite element method to solve Poisson's equation
- Delivered biweekly presentations to faculty and peers; presented a research poster at the NCSU Summer Research Symposium; currently co-authoring a manuscript for potential publication

Georgia Institute of Technology, Research Experience for Undergraduates May 2024 – Jul 2024
Applied Mathematics Researcher *Atlanta, GA*

- Designed and implemented MATLAB software to model nonlinear dynamics of coupled vibroimpact, energy harvesting harmonic oscillators comprised of a rolling ball in a hollow capsule with dielectric elastomer membranes
- Analyzed energy harvesting output and determined optimal output increase of 50% by systematically varying physical parameters, forcing amplitudes and frequencies, and enforcing resonant operating regimes
- Applied numerical methods to solve ODE system and evaluated time series, bifurcation diagrams, and phase portraits across parameter regimes to identify stability transitions
- Delivered weekly reports to faculty and peers; presented poster at the Georgia Tech Math REU Poster Session

NYU Tandon AI4CE Lab Jun 2023 – Aug 2023
Undergraduate Research Assistant *Brooklyn, NY*

- Contributed to "Energy-Aware Computer Vision" project by implementing Python-based density map techniques and experimenting with YOLO convolutional neural network architectures for large crowd counting
- Utilized Bash shell scripting and Python to automate collection and preprocessing of live video feed data from multiple geographic locations to test the models against

Projects

PAQ-MAN | *Qiskit, Python* Oct 2023

- Collaborated with a multidisciplinary team in the NYU Tandon Hackathon to tackle sustainability issues in bin-packing and route efficiency for package deliveries, optimizing workflows and reducing operational costs
- Implemented semi-classical algorithms such as Quantum Approximate Optimization Algorithm (QAOA) to solve the classical bin-packing problem, improving solution quality and computational efficiency

RGBtoI | *Python, YOLO, Mermaid, Sphinx* May 2023

- Collaborated with a cross-functional team of computer engineers and roboticists to develop a Python toolkit that allows users to easily process their RGB images/videos using YOLO computer-vision models and obtain either bounding boxes or intensity maps
- Designed UML diagrams using Mermaid and wrote comprehensive documentation using Sphinx

Awards & Certifications

Eagle Scout Jun 2022
Artificial Intelligence/Machine Learning Specialization Jun 2023
Certified Quantum Computing Associate using Qiskit Aug 2023