

Nikhil Chaudhary

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Education

Carnegie Mellon University, Master of Science in Electrical and Computer Engineering Dec 2027
Concentration: Computational Engineering Methods/Systems (CEM/S)
Coursework: Real Time Embedded Systems, Building Reliable Distributed Systems, Foundations of Computer Systems

Purdue University, Bachelor of Science in Computer Engineering, GPA: 3.93/4.00 May 2026
Coursework: Computer Design & Prototyping, ASIC Design Laboratory, Applied Algorithms, Operating Systems
Awards: William and Mary Meese Scholarship, Robert and Grace Chou Scholarship, Dean's List (all semesters)
Extracurriculars: ML@Purdue - Operations Officer; Embedded Systems @ Purdue SlayterHIL - Project Manager; Video Analytics for Daily Living (VADL) Lab - Research Assistant

Experience

Firmware Engineer Intern, Astera Labs, San Jose, CA May 2026 - Aug 2026

- Designed a solution using Protocol Buffers (Protobuf) to automate the dynamic firmware update procedure and handle memory misalignment issues, resulting in segment tagging with minimal ICCM overhead.
- Spearheaded Python SDK optimizations, slashing initialization time by 70% with PHY/PMD object caching and aliasing.
- Debugged and integrated a 1.5x faster firmware-update routine (utilizing split flash memory) into overnight regressions.
- Created a datacenter rack-level bring-up and orchestration software platform, winning 1st place in the company-wide intern hackathon and presenting solutions to founders.

Teaching Assistant, Introduction to Digital System Design, Purdue University Aug 2025 - May 2026

- Teaching 75+ students digital logic principles with lab work in SystemVerilog and circuit design.

Firmware Engineer Intern, Astera Labs, San Jose, CA May 2025 - Aug 2025

- Brought up a Real-Time Operating System (RTOS) on a PCIe switch product microcontroller, with per-core abstracted timer APIs, replacing the bare-metal task loop.
- Demonstrated a proof-of-concept non-SMP multicore RTOS functional across 6 cores.
- Debugged pre-silicon firmware on the Cadence Palladium emulation platform.
- Validated internal RTOS toolkit features such as statistics collection and async event handling.

Embedded Software Engineering Co-op, GE Appliances, Louisville, KY Jan 2025 - May 2025

- Wrote embedded C software to improve dishwasher UI and cycle features across 20+ tickets.
- Implemented a 5-state finite state machine to control LED backlight behavior on Monogram dishwashers, updating bitmap assets for each operating state.
- Programmed an autonomous "sumo bot" with IR & line sensors to compete against enemy robots.

Teaching Assistant, Advanced C Programming (ECE 264), Purdue University Aug 2024 - Dec 2024

- Assisted 50+ students with understanding and implementing dynamic data structures in C.

Technology Intern, Eli Lilly & Company, Indianapolis, IN May 2024 - Aug 2024

- Validated LLM model responsible for IT knowledge retrieval within internal IT Service chatbot.
- Generated 100+ ground truth test cases for LLM model evaluation with automated k6 load testing.
- Reported ~50 suggestions across ServiceNow knowledge base to modify/add IT service content.
- Developed a Service Desk categorization NLTK model, saving IT agents 1-2 hours daily.

Intern, United States Geological Survey, Menlo Park, CA Jun 2022 - Aug 2022

- Constructed prototype device for inexpensive desalination device to aid disadvantaged communities in need of pure water, mentored by Dr. Walter D. Mooney.
- Tested water-harvest efficiency of device with a saltwater solution by tracking temperature and solar irradiance with an Arduino TMP36 sensor and Apogee Pyranometer respectively.

Projects

Project Manager and Developer, ES@P SlayterHIL Team Sep 2025 - May 2026

- Led 20 developers to develop a hardware-in-the-loop system with deterministic timing, mock sensor injection, and regression runs for embedded drone flight controller validation.

- Architected a test interface to stream flight test cases to a physics simulation module.

Computer Vision Member, Purdue Remotely Operated Underwater Vehicle (ROV) *Sept 2023 - May 2024*

- Implemented stereo/monocular vision OpenCV models for underwater object detection, measurement, and 3D model photogrammetry.
- Refined depth mapping algorithm accuracy via tests with DWE exploreHD cameras and checkerboard calibrations.

Data Science Researcher, Merck Corporation (The Data Mine, Purdue University)

Aug 2023 - May 2024

- Collaborated with Merck Corporation on Drug-Drug Interaction (DDI) Prediction to improve patient safety by predicting drug reactions through NLP, feature engineering, and image processing.
- Visualized interactions between drug substructures on Stanford BioSNAP dataset via NetworkX.
- Leveraged PyTorch to refine and evaluate accuracy of existing Path-aware Siamese Graph Neural Network (PSG) and Substructure-Substructure Interaction (SSI) models for DDI prediction.
- Optimized an ensemble of 5 DDI models through testing of scikit-learn voting classifiers.

VR Developer, Computer Graphics and Visualization Laboratory, Purdue CS Department

May 2023 - Dec 2023

- Developed a virtual reality (VR) educational application alongside Professor Voicu Popescu, allowing instructors to highlight 3D objects in real time within students' virtual Oculus headsets.
- Added server-client connection between a browser's cursor position and 3D ray on the VR headset via WebSocket API built on TCP protocol with an object-oriented (OOP) backbone.
- Applied 3D vector math and quaternions in C# to update live rotation and position of beam in Unity 3D.

Intern, UC Santa Cruz Science Internship Program, Santa Cruz, CA

Jun 2021 - Aug 2021

- Researched the machine learning subfield of Generative Adversarial Neural Networks (GANs) under mentorship of Dr. Saeed Kargar and Professor Faisal Nawab.
- Learned the Keras API and VGG19 networks, applied knowledge to image generation of frogs and numerical digits, conducted in-depth analysis of GANs research papers.
- Programmed Auxiliary Classifier GAN (ACGAN) for pneumonia detection using Guangzhou Women and Children's Medical Center dataset of 10,000+ chest x-rays to generate and test data samples.

Skills

Programming: Python, C, C++, Java, OOP, C#, MATLAB, React, R, OpenCV, SystemVerilog, RTOS, PyTorch

Other: Unity, CAD (Autodesk Inventor), Arduino, QuestaSim, Jenkins CI/CD, Git, TCP/IP, KiCad