

Ayushmaan Puri

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EDUCATION

University of California, San Diego0000

B.S. CSE: Computer Engineering

Expected August 2026

GPA 3.50/4.0

Orange Coast College

A.S. for Transfer: Computer Science, Mathematics, and Physics

Aug 2022 - May 2024

Graduated with Honors

RESEARCH EXPERIENCE

Undergraduate Researcher | [Junkyard Autograder](#)

April 2026 – Present

Kastner Research Group – UC San Diego

La Jolla, CA

- Investigating repurposing discarded smartphones as a dedicated autograding cluster to replace oversubscribed GPU pods shared across a class of 330 students.
- Deployed a 40-node k3s Kubernetes cluster on ARM64 Google Pixel Fold devices running Debian over USB Ethernet; configured each node as an isolated Linux execution environment for containerized grading jobs.
- Modeled real submission timing and runtime distributions from 8 programming assignments using Gaussian Mixture Models with BIC-selected component counts.
- Built a synthetic workload generator sampling from fitted GMMs to stress test cluster throughput and determine the minimum phone count needed to serve a class without queuing delays.

Undergraduate Researcher | [UnifiedSplitting](#)

June 2025 – March 2026

PatLab & UC Scholars Research Program – UC San Diego

La Jolla, CA

- Built heterogeneous CPU-GPU pipelines for efficient CNN inference on unified memory architectures.
- Implemented model-splitting strategies for parallel CPU-GPU inference on NVIDIA Jetson devices.
- Profiled per-layer CPU-to-GPU speedup ratios across full network architectures, identifying a 10x gap between convolutional layers (300–500x) and fully connected layers (30–40x) that informed the optimal splitting point.
- Validated the approach across five architectures (ResNet-18/50, MobileNetV2, EfficientNet-B2, ViT-Tiny) and six simulated edge hardware profiles, achieving 8–24% throughput gains over GPU-only baselines.
- Wrote and presented a [methods paper](#) at UCSD Summer Research Conference 2025 and Southern California Conference for Undergraduate Research 2025. Recognized nationally by the CRA for outstanding research.

Summer Research Intern | [Active Thermography for Defect Detection](#)

June 2024 – Sep. 2024

SeNSE – Indian Institute of Technology, Delhi

New Delhi, India

- Developed a per-pixel signal processing pipeline in Python (OpenCV, NumPy, SciPy) to detect subsurface defects in Carbon and Glass Fibre-Reinforced Polymer (CFRP/GFRP) composites using active thermography.
- Implemented linear detrending, full temporal cross-correlation against a sound reference pixel, main lobe extraction, and FFT phase computation across three experimental datasets (LFM, Active Pulsed, and Flux excitation).
- Demonstrated that the FFT phase of the correlation main lobe produces qualitatively distinct signatures for defective vs. healthy material regions, establishing a new discriminating observable for non-destructive evaluation. Recorded results and findings in a [research paper](#).

Summer Research Intern | [Lunar Rover Modeling](#)

June 2023 – Aug. 2023

NASA California Space Grant Consortium

Costa Mesa, CA

- Designed and built a model lunar lava tube exploration rover using a rocker-bogie chassis, solar-powered with lithium-polymer battery storage.
- Developed Arduino firmware integrating UV, Hall effect magnetic, and gravimeter sensors to detect water-ice signatures, iron-rich rock, and subsurface density anomalies.
- Implemented on-board SD card data logging for sensor telemetry and an object avoidance drive system for autonomous navigation over loose regolith.

PUBLICATIONS AND TALKS

SCCUR: Southern California Conference for Undergraduate Research

Nov. 2025

- Oral presentation on UnifiedSplitting at CSU Channel Islands with Fahad Alkhazam and Parth Mehta. [\[Slides\]](#) [\[Abstract\]](#)

UC San Diego Summer Research Conference (SRC 2025)

Aug. 2025

- Presented pipeline optimizations for CPU-GPU split inference on edge devices. Results reproduced across Jetson platforms. [\[Paper\]](#) [\[Abstract\]](#)

AWARDS AND HONORS

CRA Outstanding Undergraduate Researcher Honorable Mention <i>Computing Research Association</i>	Jan. 2026
UC Scholar <i>UC San Diego</i>	May 2025
George Ciarlo Memorial Scholarship <i>Orange Coast College</i>	Apr. 2024

TEACHING, MENTORSHIP, AND LEADERSHIP

STEM Peer Mentor <i>OCC STEM Academy / MESA Program</i>	Aug. 2023 – May 2024 <i>Costa Mesa, CA</i>
<ul style="list-style-type: none">Mentored and tutored 17 first-generation STEM students, providing weekly one-on-one guidance, email check-ins, and long-term academic planning support.Organized and led workshops on career development, internships, and transfer preparation, increasing student awareness of opportunities beyond community college.Co-managed daily operations of the STEM/MESA Center with 6 peer mentors, coordinating tutoring schedules, student outreach, and resource distribution.	
Club President <i>OCC STEM Club</i>	Aug. 2023 – May 2024 <i>Costa Mesa, CA</i>
<ul style="list-style-type: none">Hosted weekly workshops and projects for 20+ members across all STEM disciplines, fostering an inclusive community for students to explore diverse scientific interests.Organized volunteering missions to foster interest in STEM fields among children. Led a group of 10 volunteers to teach young students about physics and biology at OCC's annual science night.	
Volunteer Teaching Assistant <i>Microsoft TEALS Program</i>	July 2023 – Feb. 2024 <i>Houston, TX (Remote)</i>
<ul style="list-style-type: none">Co-taught CS Discoveries curriculum twice weekly to a class of 26 middle school students, integrating lessons on programming logic and problem-solving.Collaborated with teachers to adapt instruction for a hybrid learning environment, ensuring equitable participation in both in-person and virtual settings.Designed a sustainable CS education framework for Santa Fe Junior High, enabling the program to continue beyond the volunteer period.	
Honors Mathematics Tutor <i>OCC Student Success Center</i>	Jan. 2023 – June 2023 <i>Costa Mesa, CA</i>
<ul style="list-style-type: none">Tutored 10–12 students daily in calculus (single and multi-variable), precalculus, trigonometry, and college algebraLed study groups and exam review sessions for honors calculus 1.Recognized by faculty and students for fostering a collaborative and motivating learning environment.	

PROJECTS

Tiled Matrix Multiplication Visualizer <i>HTML, JS, Parallel Programming</i>	Feb. 2026
<ul style="list-style-type: none">Built an interactive visualizer to demonstrate tiled matrix multiplication, data reuse, and memory access patterns.Published code on github and deployed at aypuri.com/tiledmatmultvis.	
ESP32 Bluetooth Speaker <i>Microcontrollers, Circuit Design, C++</i>	Apr. 2025
<ul style="list-style-type: none">Built a Bluetooth speaker with a display showing title, artist, and album, powered by an ESP32 microcontroller.Published code on github	
DSA Visualizer <i>TypeScript, Web Development</i>	Apr. 2024
<ul style="list-style-type: none">Co-created a web application with a TypeScript back-end to help students visualize core data structures (linked lists, trees, graphs, stacks, queues), bridging theory with intuitive graphics.Published code on github and deployed at animated-octo-spork.vercel.app	

TECHNICAL SKILLS

Languages: C/C++, Python, SystemVerilog, JavaScript, MIPS Assembly

Frameworks & Libraries: OpenCL, PyTorch, OpenCV, CUDA, NumPy/SciPy, scikit-learn

Platforms & Hardware: NVIDIA Jetson, Arduino, ESP32, ARM64 (Pixel Fold)

Tools: Git, Linux, Kubernetes, Docker, MATLAB, Cadence Virtuoso