Divij Muthu

CONTACT

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ADDRESS

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CURRENT POSITION

Undergraduate Student
University of California, Berkeley
Electrical Engineering and Computer Sciences Department

EDUCATION

University of California, Berkeley **Expected: Fall 2027**

B.S., Electrical Engineering and Computer Sciences
Coursework: Data Structures (CS61B) & Efficient Algorithms (CS170, A+), Computer Architecture (CS61C), Computer Security & Networking (CS161), Convex Optimization (EECS127, A+), Machine Learning (CS189), Signal Processing (EE120), Probability & Stochastic Processes (EECS126)
Advisors: Liwei Lin, Laura Waller
Clubs & Societies: Eta Kappa Nu, Mu Chapter (EECS Honors Society), Code for Good (software development for nonprofits)

AWARDS AND DISTINCTIONS

- Presented at Rice University's Gulf Coast Undergraduate Research Symposium
- Inducted member of Eta Kappa Nu, Mu Chapter
- Inducted member of Tau Beta Pi, CA-Alpha Chapter
- Dean's List, College of Engineering (3x)
- National Merit Scholar
- 3x AIME qualifier

RESEARCH POSITIONS

Liwei Lin Lab – Berkeley Sensor and Actuator Center **Berkeley, CA**
Undergraduate Researcher April 2025 - present

- *3D Imaging via Piezoelectric Micromachined Ultrasound Transducers & Compressed Sensing*
  - Built an automated data acquisition pipeline using Python, C++, and PySerial to interface with Teensy/Arduino MEGA microcontrollers, including firmware for precise submicrosecond pulse timing, retrieving real-time oscilloscope ADC data via SPI, and signal processing via background subtraction, Butterworth filtering from SciPy.
  - Adapted MATLAB simulation from EE367: Computational Imaging to test novel setup for 3D image reconstruction via ultrasound transducers (PMUTs), compressed sensing, and reconstruction algorithms (FISTA, ADMM-TV).
  - Designing a custom mixed-signal PCB in KiCad to miniaturize the system, integrating a Teensy 4.1, transmit/receive switching, signal amplification (TI VCA5807), and an 18-bit ADC into a compact device for portable deployment.
  - Paper accepted to IEEE MEMS 2026 for an oral presentation, presented findings at Rice GCURS, collaborating with Berkeley AI Research (Waller Lab) to accelerate reconstruction pipelines using machine learning techniques.

Internships

TopSeeds LLC **Pleasant Hill, CA**
Software Development Intern December 2025 - present

- Developing an AI-powered executive recruiting platform using React and Node.js, integrating the Gemini LLM API to automate screening various roles for candidate fit and generate natural language advice on pursuing these openings.
- Engineering secure backend microservices to synchronize live data with Google Sheets and Excel Online, implementing OAuth 2.0 authentication flows to ensure data integrity and security.
- Collaborating on the full-stack architecture for a system designed to process 50+ candidates weekly, optimizing database interactions to reduce latency in candidate-to-recruiter matching.

Moccet **Berkeley, CA**
Innovation Architect Intern August 2025 - September 2025

- Built an AI-powered Customer Relationship Management (CRM) pipeline in Node.js incorporating Firebase cloud functions to analyze uploaded leads for client engagement and leveraging the Gemini AI API to generate responses.
- Implemented a continuous learning loop for the CRM pipeline to automatically refine its outreach activities.

Take2 Movies and Shows **Virtual**
Full Stack Software Engineering Intern March 2025 - August 2025

- Spearheaded full-stack feature development for a social media app within a Google Cloud (GCP) and Firebase ecosystem, building core functionalities with Firebase Auth, Cloud Firestore (NoSQL), and React Native.
- Engineered several intuitive user-facing features, including app-wide movie/show and notification preference systems, front-end and back-end list sorting via a reusable component, and UI fixes for Android and dark mode.
- Reduced network latency for filtering by 20% and improved application performance by implementing batch updates, local caching, and optimized data fetching strategies with RESTful APIs e.g. TMDB API for movie/show data.

Projects

Real-Time Sensor Simulation and Activity Classification with C++, PyTorch

- Implemented C++ modules to simulate noisy sensor data streams (IMU, GPS, Compass, Barometer), and extract features including mean, variance of 3D coordinates, DFT for motion frequencies, modeling activities like walking, jumping
- Trained a lightweight neural network in PyTorch to classify the activity being performed from a live data window of 256 samples via extracted features, observing 98% accuracy & 0.98 f1-score with 100 Hz sampling rate and 6 activities.
- Built an interactive demo in PyGame with 59 fps, 30 us to simulate data in C++, 0.05 ms to classify with ML.

Secure File Sharing System in Go

- Developed a secure file sharing system using Golang, tested thoroughly for vulnerabilities with Ginkgo, and incorporated a provided cryptographic library with AES-256 symmetric encryption and HMAC-SHA256 authentication, as well as RSA-2048 asymmetric encryption and Digital Signatures.
- Allows users to create accounts, store and efficiently append to files, and both share and revoke access to their files in a manner secure from adversaries who can read & manipulate the underlying database as well as hostile revoked users who seek to regain access.

Analysis, Implementation of Machine Learning Approaches to Identifying DDoS & Benign Network Traffic

- Guided by Georgia Tech postdoc, published in UCIxGATI journal: `https://scienceyouth.org/web/viewer.php?id=175`.
- Observed ˜90% accuracy in traffic identification for an industry benchmark dataset involving simulated DDoS attacks.
- Compared and contrasted pros and cons of tested ML models from scikit-learn such as Decision Tree, Random Forest, SVM for cleaned dataset using SMOTE, provided recommendations on future approaches.

Tabu Search-guided Sigmoid Heuristic for the MLCS Problem

- Designed a new heuristic-based solution in contrast to typical deterministic methods for this NP-Hard problem.
- Evaluated the algorithm in Java using a benchmark dataset for the state-of-the-art Beam Search algorithm, consistently generated a subsequence ˜70% the length of the true longest subsequence in 1-2 seconds for 1000 character sequences.
- Created a piece of generative art using the algorithm's output for a Lindenmayer System.

Service

Eta Kappa Nu, Mu Chapter: **Berkeley, CA**
Prodev Officer, Serv Member Fall 2024 - present

- Officer for the Professional Development Committee, providing resume review services and career advice for members of the EECS community at Berkeley.
- Supporting the Service Committee with running the CS Lab for (Jr) EECS Day, introducing middle and high schoolers to topics like implementing Connect Four in Python.

Teaching

EECS16A: Foundations of Signal Processing, Dynamical Systems **Berkeley, CA**
Lab Tutor Fall 2025 - present

- Supporting students' learning of key linear algebra and signal processing concepts, aiding completion of challenging labs e.g. performing Principal Component Analysis with NumPy.

Skills

Programming Languages:
Python, MATLAB, C, C++, Java, HTML, JavaScript, CSS, TypeScript, Go, SQL

Developer Tools:
Visual Studio Code, IntelliJ, GitHub, Postman, Jira, XCode, Android Emulator, GDB, JUnit, Ginkgo (Go Testing Framework)

Technologies & Frameworks:
Node, React, MongoDB, Google Cloud Platform (GCP), Firebase/Firestore, RESTful APIs, Expo Router, Pandas, Matplotlib, NumPy, Scikit-learn, Arduino, SciPy, RISC-V CPU & ISA, LTSpice, KiCad, Linux OS