

KAUSHIK MURUGAN

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EDUCATION

University of California, Davis

Sep. 2020 – June 2024

Bachelor of Science in Computer Science and Engineering, Minor in Mathematics

Davis, CA

- **GPA: 3.90**
- **Awards:** College of Engineering Dean's Honor List for 8 Quarters, Computer Science Undergraduate Scholarship
- **Relevant Courses:** Artificial Intelligence, Machine Learning, Deep Learning, Software Engineering, Computer Graphics, Computer Architecture, Embedded Systems, Operating Systems, Computer Networks

SKILLS & INTERESTS

Languages: Python, C, C++, C#, Embedded C, Assembly, TypeScript, JavaScript, Java, HTML, CSS, Bash, MATLAB

Tools and Platforms: Git, GitHub, Unix, Linux, macOS, Docker, AWS, Google Cloud, Firebase, Unity, Godot

Frameworks and Libraries: PyTorch, TensorFlow, NumPy, Pandas, React, node.js, next.js, WebGL, OpenGL

Interests: AI/ML, Software Development and Design, Full-Stack, Networking, Robotics, Game Dev, Cryptography, DevOps

EXPERIENCE

AI/ML Researcher at Davidson Lab

Mar. 2024 – Present

Under Professor Ian Davidson, UC Davis Department of Computer Science

Davis, CA

- Developing a model that autonomously generates human-interpretable methods for solving puzzles like the *Rubik's Cube*
- Researching novel techniques utilizing Auto-Encoders, DNNs, and Reinforcement Learning to identify sub-goals for methods
- Conducting extensive data analysis leveraging domain knowledge, resulting in a 25% improvement in solution ergonomics
- Extensively studying papers during reading sessions regarding topics such as LLMs, Fairness & Explainability in AI, and Ethics

Computer Science Tutoring at UC Davis

Jan. 2022 – June 2024

Vice President of Software Engineering and Tutor

Davis, CA

- Led and mentored a group of 4 undergraduates on SWE projects such as updating our Office-hours Discord bot and building a website with data visualizations for tutors, utilizing Discord API and Google Cloud API
- Tutored over 200 undergraduates on various CS topics such as OOP, data structures, algorithms and computer architecture
- Conducted code reviews for students taking introductory Computer Science courses in C and C++

UC Davis Academic Assistance and Tutoring Centers

Sep. 2022 – Mar. 2024

Math and Physics Tutor

Davis, CA

- Tutored undergraduates on introductory Math and Physics courses in over 100 sessions
- Developed proficiency in communication, learning and teaching skills

PROJECTS

Y.A.B.O.B. (Yet Another Better Office-hours Bot)

Jan. 2022 – Present

Lead Developer | TypeScript, node.js, Discord API, AWS EC2, Firebase, Google Cloud

[GitHub](#)

- Built a Discord bot that automates the office-hours (OH) queuing process used by UC Davis faculty and 1000s of students
- Implemented user-friendly scheduling, attendance and quality of life features using Discord.js, Google Cloud and Firebase
- Created a sophisticated, well documented, and open-source code base that utilizes object-oriented design patterns
- Processed over 5000 sessions with near-zero downtime, and improved accessibility for students by 350%

F1-Tenth Autonomous Racing Car

Jan. 2024 – June 2024

Developer (Capstone Project) | ROS 2, Python, C++, GTest, PyTest, Docker

[Video](#)

- Contributed to the computer vision team for a 1/10 scale autonomous car with LiDAR to compete in inter-competitions
- Implemented SLAM and race-line optimization in ROS2, enabling the car to autonomously map and drive through a track
- Researched and incorporated obstacle avoidance algorithms, reducing collision rate to 5%
- Tested algorithms in Docker environment to simulate the vehicle, with PyTest for Python and GoogleTest for C++

Connect 4 on Embedded Systems

June 2023

Developer (Course Project) | TypeScript, node.js, Embedded C, Embedded Hardware, AWS IoT, AWS EC2

[Video](#), [GitHub](#)

- Collaborated with a partner to develop an online multiplayer Connect-4 game that runs on two ARM microcontroller boards
- Designed circuits with an IR sensor/remote as GPIO input and used SPI/UART to draw the game on an OLED for each board
- Leveraged AWS IoT services for networking between the boards and the server hosted on EC2, using MQTT and REST
- Programmed the clients in Embedded C, and the server in Typescript and node.js