

# CHINMAY MURTHY

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## ELECTRICAL AND COMPUTER ENGINEERING STUDENT

I love building things that integrate software, electronics, and mechanical elements, with a passion for robotics and software engineering (C++, Java) gained through a leading role at the top ranked ARUW robotics team, and work experience at a startup (FPGAs, Python).

### EDUCATION

**University of Washington** | Seattle, WA

September 2022 - June 2026

- Bachelor of Science, Electrical and Computer Engineering (ECE), 3.73 GPA
- Coursework (through Winter 2025): *Control Systems Analysis I*, AC Circuit Theory, Digital Logic (Verilog), Signal Processing I II, *Intro to Optimization and ML*, *Autonomous Robotics*, HW/SW interfaces (C), Algorithms and Data Structures, Kinematics and Dynamics

**Mission San Jose High School** | Fremont, CA

August 2018 - June 2022

- 3.84 GPA (unweighted, took 9 college-level courses) | National Merit Finalist (1580 SAT)

### EXPERIENCE

**Photonics Systems Lab**, University of Washington | Seattle Washington – *Research Assistant*

October 2024 - Present

- Optimizing an **MSCKF** based VINS algorithm for GPS-fused **visual inertial odometry** on an outdoor ground robot (ROS, C++)

**Geegah LLC**, Cornell University, SonicMEMS Lab | Ithaca NY

*Engineering Intern*

June 2024 - Sep 2024

- **Brought up** and **verified RF circuitry** in next-gen (4x pixel density) ultrasonic imager with 200+ components
- **Optimized FPGA Verilog** resource utilization by **25%** and increased fps by **100x** by rearchitecting interface with **FTDI** USB chip
- Designed and implemented Python API for USB communication, resulting in successful customer demos and IEEE IUS presentation
- **Documented** all systems using UML, markdown, block/state diagrams, docstrings, and design write ups

*Applications Intern*

June 2023 - Sep 2023

- Developed cost efficient integration of proprietary imager technology with 3 axis motion control stage for large sample imaging
  - Result was demoed and presented at **DARPA ERI summit** 2023 (1300+ participants)
- Prototyped and troubleshooted fluidics, electronics and full web app stack on **Raspberry Pi** for a water quality monitoring PoC device
- Used **Flask** in Python to create a **REST API**, live gcode insertion via serial interface, to enable fully remote operation

### CLUBS AND ACTIVITIES

**Advanced Robotics at University of Washington** – *Controls Software Lead*

Sep 2022 - Present

- Designed and implemented **LQR** based controller of a **balancing two-wheel-legged robot (5-bar active suspension)**. Simulated in **Matlab/Simulink** before deploying to STM32 embedded environment
  - Currently investigating RL and MPC control policies for the next iteration
- Designed nonlinear sensor fusion algorithm that **eliminated** angular drift between 3 IMUs on independently articulated gimbals
- **Managed team** of 10 students to successfully **deliver** and **document** the following under tight deadlines in a **75k+ LoC** codebase
  - A novel autonomous path-following algorithm that can operate at **3x** the speed as its previous iteration
  - **Kalman Filter** odometry with 2-3cm drift over 100m travel distance and fusion with fiducial marker information (**C++**, **Git**)

**DubHacks (UW Hackathon): Wallscapes**

Oct 2023

- Created an AR iOS app to project virtual art pieces onto public spaces using **ARKit** in **Swift**

**FTC Robotics Team 14504 Serenity Now!** - *Captain and Lead Software Developer*

June 2018 - May 2022

- **Implemented** odometry, pure pursuit, spline interpolation for path planning, obstacle avoidance, **PID control**, computer vision using **openCV** and TensorFlow, and **multithreaded** software architecture in **Java** on **Android (7k+ LoC)**. **Placed 3d** in regionals subdivision, **won controls awards** twice. **Led and managed team** of 7 students to execute complex design iterations, fund raising, and outreach.

**Expy: Food Expiry Tracker App**

May 2021 – May 2022

- Built an **Android** app to reduce food waste (by **20%**) by tracking food expiry dates using computer vision and robust date parsing

**Custom Dorm LEDs**

- Wrote web server (**html/css**) on **esp32** microcontroller to drive Neopixel LEDs and emulate BLE Midi & coordinate lights with music

### SKILLS

**Programming Languages:** C++ · Python · Verilog/System Verilog · Java · HTML · CSS · Javascript

**SW Tools/Libraries:** Git · GoogleTest · ModelSim · Quartus · OpenCV · modm · Matlab/Simulink · Flask · Unix/Linux · ROS

**Other:** Arduino · Raspberry Pi · Finite Element Modeling (OnScale) · LaTeX · Fusion 360 · Solder · Oscilloscope/Logic Analyzer