

# Amrik Verma

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## EDUCATION

### University of California, Berkeley

GPA: 3.65

*B.S. Mechanical Engineering, Minor in EECS*

*May 2027*

**Coursework:** Python & MATLAB, 3D Modeling for Design, Physics: Mechanics & Electromagnetism, Linear Algebra, Differential Equations, Solid Mechanics, Thermodynamics, Mechanics of Materials, Circuits & Devices, Data Structures & Algorithms

## SKILLS

**Programs:** SolidWorks, Ansys, PDM, Simulink, LabVIEW, OnShape, Jupyter, GitHub, VS Code, Microsoft Office, Excel

**Languages:** Python, MATLAB, Java, PyTorch, Pandas, NumPy, Dart

**Technical:** CAD, GD&T, FEA Simulation, Engineering Drawings, Precision Machining, CNC Machining, 3D Printing, Milling, Lathe, Laser Cutting, DFM, Rapid Prototyping, Topology Optimization, Circuitry, Arduino, Sensors, Git

## EXPERIENCE

### FSAE Berkeley Formula Racing

Berkeley, CA

*Drivetrain Engineer*

*Sept 2025 – Present*

- Designed wheel hubs, differential mounting plates, and jacking bar using SolidWorks, ensuring durability for the new engine
- Optimized 7075-T6 aluminum wheel centers for carbon fiber shells with SolidWorks and Ansys topology optimization to achieve a 59% weight reduction, validating it to a factor of safety of 1.3 with FEA
- Performed tolerance stack-up analysis and created jigs for CNC, increasing accuracy and consistency for various parts of the car
- Executed strain gauge tests and modal vibration analysis to validate FEA predictions, improving fatigue resistance and vibration damping for chain guard

### University of California, Berkeley, Department of Mechanical Engineering

Berkeley, CA

*Undergraduate Researcher - High Performance Robotics Lab Research Group*

*May 2025 – Present*

- Implemented NMPC for tilttable-quadcopter in PyTorch, simulating PyBullet tracking with 5% trajectory error across 50 flights
- Modeled servo actuators as 1st-order systems using state/input constraints, enabling live trajectory tracking in hardware testing
- Benchmarked 6-DOF tracking in overactuated UAVs, reducing disturbance rejection by 30% vs. conventional controllers
- Prototyped teaching platforms for ME136 UAV course, replacing Crazyflie drones with safer, efficient, and 15% cheaper design

*Undergraduate Researcher - FLOW Lab Research Group*

*Sept 2025 – Present*

- Designed preliminary wiring diagrams for 20+ sensors using circuit CAD for a flow loop with 4-person team and PhD student
- Developed sensor integration plan and LabVIEW code for cDAQ system, optimizing data acquisition and experiment setup

### Berkeley Underwater Robotics

Berkeley, CA

*Mechanical Subteam Member*

*Jan 2025 – Sept 2025*

- Designed and 3D-printed AUV dropper mechanism, reducing deployment time by 40% across trials through iterative testing
- Engineered pneumatic torpedo launcher using Ansys, achieving 12 m/s launches with 0 failures across 50 underwater tests
- Prototyped adaptive magnetic claw with CAD, improving retrieval success rate from 60% to 90% in underwater object recovery

### Ati Motors

Detroit, MI

*Mechanical Design Intern*

*May 2024 – Aug 2024*

- Performed HIL testing and assembly for AMRs in 15 factories across 2 countries, validating LiDAR and industrial sensors
- Prototyped and optimized battery modules, achieving sub-2 minute cold swaps, boosting autonomous vehicle uptime by 20%
- Calibrated and integrated motors, encoders, and control units improving localization error to less than 5 cm during testing

## PROJECTS

### Wind Turbine Design Project | SolidWorks, 3D Printing, FEA

*Jan 2025 – May 2025*

- Developed a 3D-printed wind turbine generating 2W, optimized stiffness and assessed stress distribution through linear FEA
- Designed rotor blades with 10 degrees angle of attack and 17 degrees twist, achieving 18 N/m stiffness and 16% energy increase
- Used SolidWorks, FEA, and SLA fabrication to prototype, test, and validate components, achieving gains in wind simulations

### MATLAB Bone Implant Analysis | MATLAB, Solid Mechanics

*Jan 2025 – May 2025*

- Developed a MATLAB suite to model femur stress distributions under asymmetric bending with and without implants
- Computed stress fields, neutral axis orientation, and centroids using BMD-weighted modulus maps from medical imaging data

## ACTIVITIES & LEADERSHIP

### Pi Tau Sigma, Berkeley Mechanical Engineering Honor Society

Berkeley, CA

*Industry Relations Officer*

*May 2025 – Present*

- Established partnerships with 5 engineering firms, coordinating info sessions and networking events for industry engagement
- Organized and led professional & research panels, increasing student participation in career development events by 40%

### FIRST Robotics 2813

Saratoga, CA

*Fabrication and Software Lead*

*May 2022 – June 2024*

- Designed and fabricated intake, wrist, & shooting mechanisms, leading to a regional championship and FIRST Impact Award
- Trained 30 members in CNC machining, developing workshops that improved fabrication speed, accuracy, and rookie proficiency
- Mentored 35 students in Java and Git, improving code reliability and deployment with 50% reduced failures during matches