Bryan Nguyen

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Education

University California Irvine **Expected Graduation: 2027**

Pursuing Bachelor of Science in Mechanical Engineering – GPA: 4.0

Skills

Technical Skills: SolidWorks, AutoCAD, OnShape, SIMULINK, 3-D Printing, Arduino, KiCAD
Interpersonal Skills: Leadership, Teamwork, Collaboration, Conflict Resolution
Programming Languages: MATLAB, C++

Projects

5-DOF Robotic Arm **Jul 2025 - Present**

- Designed, fabricated and tested a 5-DOF robotic arm, with a payload capacity of **250g**
- Designed full mechanical assembly in **SolidWorks** and **3D printed** structural parts and custom gears (ABS / PA6-GF); assembled with stainless fasteners and brass heat-set inserts
- Built custom electronics and power system: barrel-jack input, LM2596 buck regulation, hand-wired power rails, NEMA-17 base rotation and servos for joints; prototyped on breadboard and soldered to perfboard
- Embedded firmware in **C++** on an **Arduino Nano** to read four potentiometers from a master controller, driving servos and stepper motor for real-time teleoperation
- Plans to create a custom PCB and an inverse kinematics motion playback in the next development phase

Solid Rocket Motor **Jan 2025 - Jun 2025**

- Led a 5-person team in the design, machining, and static test fire of a solid rocket motor **TW-39**. Achieved a max thrust of **2000N** and a total impulse of **5776 Ns**
- Developed a sugar-based propellant with aluminum powder, optimizing combustion efficiency for improved performance
- Designed the motor using **OnShape**, ensuring manufacturability and structural integrity before fabrication
- Conducted a single-grain motor test to gather burn rate data, then interpolated results and simulated performance using **MATLAB** to predict final output
- Integrated into a dual deployment rocket, achieving an altitude of over **7000 feet**, placing fourth in the **2025 FAR-UNL competition**

Tiny House Energy Efficiency Analysis **May 2024 - Jun 2024**

- Designed and simulated thermal performance models of tiny houses using **MATLAB & Simulink**, evaluating insulation effectiveness and energy consumption.
- Conducted real-world temperature data collection with **Vernier** temperature sensors, tracking indoor and outdoor conditions over 48 hours to analyze heat retention

Experience

Solid Rocket Fuel Research **Sept 2024 – May 2025**

Cal Poly Pomona ENGAGE Program

- Conducting research on performance-enhancing techniques for sugar-based rocket propellants, focusing on supplemental oxidizers and metal fuel additives
- Designing and executing static tests to analyze burn rate, efficiency, and thrust performance of different propellant formulations

Embedded Tutor - Engineering Statics **Aug 2024 – Feb 2025**

Mt. San Antonio College

- Led group tutoring sessions, guiding students through problem-solving, coursework, and fundamental statics concepts
- Assisted the professor during lectures, providing real-time support to students on in-class exercises
- Adapted explanations to different learning styles, fostering a supportive and engaging environment

Rocket Workshop **Sept 2024 – Jan 2025**

Workshop Lead

- Designed and co-lead a 10-week workshop for **30 students**, covering CAD, simulation, and fabrication of rockets
- Organized meetings, budgets, and logistics, adapting to challenges like relocating fabrication space
- Provided hands-on mentorship, guiding students through design challenges and technical skills