Yunosuke Nakamura

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EDUCATION:

August 2025 **BS, Mechanical Engineering**
University of California, Berkeley
Masason Foundation Scholar (full ride merit scholarship)

EXPERIENCES AND PROJECTS:

Sep 2025-Present **Undergraduate Researcher, Mechanical Systems Control Lab at Berkeley**

- Developing a Master-Slave teleoperation system for the DexCo soft robotic hand, mapping human kinematics to hydraulic syringe actuators.
- Wrote embedded C++ firmware for ESP32 to implement PID control loops, managing I2C communication for AS5600 magnetic encoders.
- Built a custom Python (PyQt5) control dashboard to visualize real-time pressure/position telemetry and handle serial communication protocols.
- Designed and wired the electrical interface between the microcontroller, custom PCBs, and PWM motor drivers.

Sep 2025-Present **Dynamics Engineer, Formula Electric at Berkeley**

- Responsible for mechanical design and analysis of anti-roll bar (ARB) within the suspension subsystem of electric racing car for Formula SAE Student Competition.
- Ran Fininte Element Analysis on Ansys Mechanical to ensure >1.5 FOS during the twist of the ARB, while reducing the mass by 36% compared to prior design.
- Mechanically designed rocker for double wishbone configuration.

Jun 2025-Aug 2025 **Research Assistant, Goda Laboratory at University of Tokyo**

- **GitHub: https://github.com/Ag3ntN/dobot-nova-control-goda-lab**
- Developing a robotic manipulation system capable of extracting larvae from fluid-filled vials using a fluidic tube mounted on a Dobot Nova robotic arm.
- Implementing stereo vision with dual Zelux CS165MU cameras to triangulate larval position and track motion in real time utilizing DeepSORT.
- Designing and testing lightweight computer vision algorithms (background subtraction, Lucas-Kanade optical flow) for robust detection in fluid environments.
- Controlled robotic movement of arm using Dobot API.

Jan 2025-Aug 2025 **Mechanical Engineering Intern, Renatus Robotics (https://www.renatus-robotics.com/)**

- Paid mechanical engineering internship based in Tokyo, Japan.
- Designed and tested motor testbed using ESP32 microcontroller with CANBus communication for inertial wheel experiments.
- Developed lifter cage system for robotic cargo transfer; performed finite element analysis (FEA) to ensure structural rigidity and load safety.
- Engineered a two-staged cascading horizontal elevator fork to acquire and transfer cargo efficiently from storage racks.

Awards

2025 V5 Robotics Competition Japan National Champion
International First Place, Real World Design Challenge
2024 Masason Foundation Full-Ride Scholarship to University of California, Berkeley
2023 FIRST Robotics Dean's list finalist award

SKILLS & INTERESTS

- **Mechanical Design and Manufacturing:** earned Onshape associate certificate; proficient with Fusion360; Experienced with mechanism design. Adept with CAM software and CNC milling.
- **Robotics, programming, and computer vision:** Proficient in Python, especially computer vision libraries; Familiar with C++, Javascript, and Java; PID, Path planning, Pure Pursuit, Odometry