

Hudson Aibel

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EDUCATION

Columbia University, School of Engineering and Applied Science, New York, NY Expected May 2028
Bachelor of Science – Mechanical Engineering

Relevant Coursework: Materials and Manufacturing, Heat Transfer, Mechanics Of Solids, Electromagnetism and Optics, Classical and Quantum Waves, Multi-Variable Calculus, Applied Mathematics

SKILLS

Software: SOLIDWORKS, Onshape, Fusion 360, KiCad, Altium, Python, C++, OpenCV, Arduino, Raspberry Pi, Microsoft Office

Machines: Haas CNC Mill, Haas 4 Axis Lathe, Bridgeport Mill, Mitsubishi RA90 Wire EDM, Boss Laser Cutter, 3D Printing

Other: Machine Design, Geometric Dimensioning and Tolerancing

WORK EXPERIENCE

Columbia University Robotics and Rehabilitation Lab, New York, NY – *Undergraduate Researcher* August 2025 - Pres.

- Researching soccer header performance by comparing biomechanics of amateurs and professionals; developed a ball-stabilization mechanism for controlled testing
- Experimenting with BLDC motors in a 7-motor cable-actuated exoskeleton to train and measure neck movement
- Deliver weekly progress presentations to the principal investigator, providing technical updates and receiving feedback

Columbia University Makerspace, New York, NY – *Superuser* Sept 2025 - Pres.

- Certified instructor on CNC mill, 3d printers, laser cutter, vinyl cutter. Run workshops, onboard new users, hold office hours

Columbia University SHAPE Program, New York, NY – *Summer Student Leader* Summer 2025

- Teaching Assistant for 50 high-school students learning to design and build quadruped robots
- Designed and taught an elective on game theory to 60+ students

Boston University RISE Internship, Boston, MA – *Research Intern* Summer 2023

- Worked in the BU Robotics Lab of Prof. Roberto Tron. Created machine learning algorithms to filter IMU rotational data
- Evaluated performance of low-cost \$25 IMUs against \$1,000 medical-grade sensors for gait analysis in rehab

Unlimited Tomorrow, Rhinebeck, NY – *Intern* July 2022

- Created a proof-of-concept prototype of a haptic feedback system that will enable the wearer of a prosthetic hand to sense the density of objects it is touching so the wearer knows how hard or soft to grip it. Presented the project to the founder/CEO

PROJECTS

Columbia University Robotics Club, New York, NY – *President (Club-wide), Combat Robotics Lead* Sept. 2024 - Pres.

- Elected President of the club, which includes six robotics teams and 200 members; lead the Executive Board and oversee club-wide operations, strategy, \$40k budget and annual events, including the MakeCU Hackathon
- As Combat Robotics Lead, personally handle the full build cycle — CAD, CNC machining, assembly, and competition
- Designed and manufactured a custom all-aluminum four-wheel drivetrain and high-speed vertical spinner; iterate on parts between competitions based on failure analysis

Beach Bots, Santa Monica, CA – *Founder and Captain* June 2020 - April 2024

- Founded an independent FIRST Tech Challenge robotics team; recruited members and oversaw all aspects of CAD design, parts manufacturing, robot assembly, programming, community outreach, mentorship, and sponsorship
- Worked with mentors from SpaceX, Snap, Disney Imagineering, and Unlimited Tomorrow

Open Source Projects: opTake, opInsert, opSpool, Virtual – *Founder* Nov. 2021 - Pres.

- Developed and published customizable intake and slide systems for FTC robotics teams
- Downloaded by more than 10,000 users across 40 U.S. states and 10 countries

HONORS & ACTIVITIES

FIRST Leadership Award Finalist, FIRST Tech Challenge

- FIRST's highest individual honor awarded to only 165 students worldwide out of more than 70,000 participants.

Activities: Columbia Secondary School FRC 9295 Design Mentor, Paid CAD Tutor, Columbia University Rock Climbing Club

Interests: Drones (design, build, program, and fly), 3D Printing, Wakeboarding, Skiing