PORTFOLIO: NILIJENGA.COM

Elijah Bell

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EDUCATION

Massachusetts Institute of Technology (MIT) (Class of 2025) — Cambridge, MA

- Candidate for Bachelor of Science in Mechanical Engineering, Minor in Computer Science, specialization in Autonomous Machines
- Relevant Classwork: Controls, Dynamics, Statics, Manufacturing, Algorithms, Machine Learning, Engineering Leadership, Negotiation

WORK

Oligo Space – Satellite Systems Engineer (2024 summer) — Venice Beach, CA

- Created an orbital simulator with EGM gravity for analyzing orbits and determining key metrics (eclipse time, return time, etc)
- Performed thermal analysis in TD & guided mechanical FEA on preliminary model to validate environment and launch survival

Rocket Lab – Spacecraft Systems Engineering Intern (2023 summer) — Long Beach, CA

- Simulated, designed, and constructed automated helium flow rig for characterization of spacecraft propulsion hardware
- Developed an automated battery tester with SCPI power control, data logging, visualization, and pass/fail text report generation.
- Performed deorbit mission rehearsal, solar panel deployment testing, and researched long term pre-load loss in springs & poron

Gordon-MIT Leadership Program – Participant (2023-2024) — Cambridge, MA

- Engaged in a selective leader development program to hone teamwork and leadership skills for more effective industry performance

MIT GTL Italy – Teacher (2024 January) — Carpi, Italy

- Taught high school students the fundamentals of electronics, Arduino, and Robotics. Culminated in small lego robotics competition

MIT – Director of New Vassar Makerspace (2021 – 2024) — Cambridge, MA

- Individually established & maintained MIT makerspace with $20K budget, managing inventory, safety, & training for 450 students

Black Swift Technologies – Engineering Intern (2022 summer) — Boulder, CO

- Designed and delivered novel payload systems ranging from ultrasonic wind sensing to thermal mapping to radio communication
- Created ground station for NOAA's P-3 aircraft, enabling control and data monitoring for airborne launched hurricane research

PROJECTS (Portfolio: Nilijenga.com)

Engineer – Automated Etch-A-Sketch Robot (Spring 2023): — Cambridge, MA

- Programmed and built an automated etch-a-sketch capable of drawing a user's arbitrary text input, used BFS, Dijkstra, and DFS.

Researcher – 3D Foundation Models w/ MIT CSAIL (January 2024 – May 2024): — Cambridge, MA

- Developing model for reconstructing environment from incomplete RGB-D data for use in robotic reasoning and planning
- Trained ML model on custom 3D dataset with geometric priors. Tested model in simulation, PyBullet + Isaac Gym for sim-to-real

Lead Developer – Levitation Learn (Fall 2023): — Cambridge, MA

- Developed a reinforcement learning model using PPO for 3DOF magnetic levitation and manipulation. Wrote research paper

Founder – Majani Reference Surface (2022-Present): — Cambridge, MA

- Secured $2500 in MIT grant funding for business development of Majani: a set of modular hexagonal 3DoF Stewart platforms for creating dynamic physical effects using decentralized communication. Custom made PCB circuitry, communication protocol, UI, etc.

Engineer – 2.007 Robot (Spring 2023): — Cambridge, MA

- Individually built a small competition robot with double four-bar linkage, autonomous code, drivetrain, and multi-use manipulator

Researcher – Machine Learning for Organic Carbon Prediction (2023): — Cambridge, MA

- Collaborated with MIT's MCSC to develop ML model to predict soil organic carbon (SOC) content from spectroscopy data.

Founder – Thin Blue Lie (thinbluelie.us) (2020-2021) — Boulder, CO

- Individually developed a website and database for contextualized crowd-sourced police misconduct data, charities, and essays.
- Tech stack includes .NET Core, Linux VPS, MySQL, Redis, Docker, backup APIs, and remote logging. Gained proficiency in C#

Lead Engineer – ULA's Rocket Launch Competition (2019 & 2021 summers) — Boulder, CO

- Designed and built rocket payload to be ejected at 5,000ft. Annual designs included a collapsible drone and a soil-sampling rover.

AWARDS/ACCOMPLISHMENTS

Morris Esmiol Jr. Scholar – Awarded a $50,000 scholarship from the Sachs Foundation.

Bartlett Scholar – Awarded a $52,000 scholarship from the Jim and Dede Bartlett Foundation

Naval Science Research Award – For CFD research on "Optimization of a Small-Scale Convergent Nozzle in COTS Turbojet Engine" with Project Boom received the Naval Science Award from the U.S Navy and Marine Corps' Office of Naval Research.

SKILLS/INTERESTS/FUN PROJECTS

Other Fun Projects: "Anything compass", gas powered snowboard winch, go-kart, metal foundry, generatively modeled drone, and more

Skills: Robotics, Python, C++, JS, C#, Algorithms, CAD, PCBA design, PID, ML/AI, Vision, 3D printing, Fabrication, CNC machining, Molding/Casting, Word, Excel, PowerPoint, and raising $11,000 for charity by organizing students to walk across all of Rhode Island

Interests: Woodworking, robotics, building things in general, flying planes and drones, climbing, hiking, basketball, doing new things