Marta David Nunes

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MEng Mechanical Engineering (Product Design) student at UC Berkeley, graduating May 2027. Mechanical and product design engineer: CAD, FEA, mechanism design and 3D-printed prototype iteration. 2nd place, CAD Challenge 2026.

EDUCATION

UC Berkeley, *Master of Engineering*, *Mechanical Engineering – Product Design* **Aug 2026 – May 2027**

- Courses: Advanced Designing for the Human Body, Failure Analysis of Structural Materials

University of Bristol, *Bachelor of Engineering*, *Mechanical Engineering* **Sep 2023 – May 2026**

- GPA: 3.58; Bristol PLUS Award (awarded to less than 5% of students)
- Courses: Applied Solid Mechanics, Materials Engineering, Thermofluids, Dynamics & Control, Engineering by Investigation

PROJECTS

Anthropometric Tendon-Driven Prosthetic Hand, *Final-Year Project*, *5-person team* **Jan 2026 – Apr 2026**

- Led the iteration and 3D printing of 3 versions (elastic resin and TPU) of the elastic extensor that straightens a prosthetic finger
- Used Siemens NX flexible body, FE and motion analyses to find why the versions failed (too much starting tension, too little stored energy) and recommended dropping it
- Simulated two torsion spring designs in Siemens NX FE: both returned the finger to its start position, and design 2 reached a higher maximum return velocity at the PIP joint (83.5 vs 70.0 mm/s); physical tests are still required
- Contributed to a team prototype that met the under 400 g limit and 4 of 5 design objectives

Hands-Free Automatic Book Page Turner – 2nd Place, *CAD Challenge 2026*, *3-person team* **Sep 2026**

- Developed the concept and functions (except the electroadhesive page separator) and chose the materials, manufacturing process, assembly approach and aesthetics
- Modeled the stand subsystem (base, back support, sliding and rotating tilter on a custom rail) and produced technical drawings, an exploded view and a BOM for the full assembly in Autodesk Fusion
- Applied DFMA: proposed a split-body design that is easier to injection mold and a base weighted with the electronics to resist tipping and entrapment

Assembly Lead, MEng Capstone: Automated MOF Deposition Rig, *UC Berkeley*, *CA*, *3-person team* **Sep 2026 – Present**

- Leading the assembly design in Prof. Hayden Taylor's Design for Emerging and Nanoscale Manufacturing lab: building the compact assembly in Autodesk Fusion for a rig that automates MOF deposition for carbon capture
- Designing 3D-printed mounts for the rig's components; further details withheld for confidentiality

MedUp Prescription Pickup Locker, *Engineering Management*, *6-person team* **Jan 2026 – May 2026**

- Compared concepts with Pugh matrices (simplicity, cost, protection against electrical failure) and chose spring-latched drawers with QR code and keypad access
- Specified a 304 stainless sheet-metal chassis with TIG welding and selected components from supplier datasheets
- Sized the insulated, refrigerated enclosure with thermal hand calculations: 13 W of heat loss through the PU walls (1.5 safety factor) gives a 4.25% compressor duty cycle
- Sized a 12 V LiFePO4 backup battery for a 3-hour power-cut target

Solar Panel Deployment Mechanism, *Engineering Practice*, *4-person team* **Feb 2025 – Apr 2025**

- Led the team and owned over 40 requirements in the PDS
- Ideated and built LEGO prototypes of 3 of 4 concepts and chose the scissor mechanism with a Pugh matrix
- Designed the failsafe motor control alone: sensors, state diagram and Arduino IDE interlock code that checks pressure, proximity and voltage against thresholds (code not yet run on hardware)
- Calculated a 10.65 s deployment time and an 8.17 kg mechanism mass from CAD

Pressure Vessel Lifting Lug Design Evaluation, *Applied Solid Mechanics* **Nov 2025 – Dec 2025**

- Assessed whether a pressure vessel lifting lug is safe: hand calculations checked with FEA in ABAQUS CAE gave a yield-to-stress ratio of 5.6 at the weld and 2.7 at the eye peak (131.1 MPa) against 355 MPa yield, with a calculated fatigue life of 1.77×10^5 cycles and a proposed 10^5-cycle inspection interval

Tent Thermal Management, *Heat Transfer* **Dec 2025**

- Calculated how much heat a 2-person camping tent loses on a worst-case UK winter night by modeling conduction, convection and radiation (Grashof, Reynolds and Nusselt correlations): a 3.9 kW net heat loss
- Proposed 3 passive fixes (ground insulation, reflective layers, wind flaps) that cut modeled heat loss by 82% to 706 W, which still needs heating; sanity-checked against published data

Assistive Drinking Device (in progress), *Design for the Human Body*, *5-person team* **Sep 2026 – Present**

- Took the notes in a patient interview, one of two user interviews (with a caregiver) that led the team to choose an assistive drinking device for people with limited hand strength or motor control; concept not yet chosen

Sensor Circuit & Young's Modulus Experiment, *Engineering by Investigation* **Apr 2024**

- Built a microphone circuit (filter, amplifier, DC offset trim) on a Pico, verified it with a 500 Hz test tone, and used it to record steel ruler vibrations at 3 lengths over 9 trials
- Analyzed the signals in Python (Butterworth filter, frequency extraction) to calculate Young's Modulus
- Traced the 50.83% shortfall against the known steel value to damping, noise and filter cutoff

What to Wear Website (side project), *Personal project* **Mar 2026 – Present**

- Designed a website that suggests a daily outfit from the weather and the clothes the user owns and plans trip packing from past weather; I decided every feature and how it works, and AI wrote all the code

EXPERIENCE

Innovation Lab Intern, *Logoplaste*, *Cascais*, *Portugal* **Jun 2025 – Jul 2025**

- Tested 6 recycled plastic samples (density, viscosity, moisture, purity via spectroscopy and colorimetry) against supplier quality specifications so they could be reused in packaging; 3 passed and were cleared
- Ran a biomimicry analysis of ticks, identified 5 properties and proposed applications in medical adhesives and inflatables
- Worked across Design, CAD/FEA, Quality, Molds and Trials teams; visited 2 plants (extrusion, injection molding)
- Organized over 100 Migration Test documents from 68 plants so the Raw Materials team could find and trace them

Microplacement Student, *Matter.*, *Bristol*, *UK* **May 2026**

- Completed a design engineering technical challenge to model a rotating sprinkler system
- Shadowed engineers to learn filtration product mechanics and company workflows

Aircraft Engine Maintenance Shop Intern, *TAP Air Portugal*, *Lisbon*, *Portugal* **Jun 2024 – Aug 2024**

- Compiled LEAP-1A engine maintenance procedures so the shop could evaluate the licenses and capability needed to service that engine
- Shadowed technicians through the full engine overhaul cycle (CFM56, LEAP-1A/-1C) to learn its tools and workstations

Co-Founder & Treasurer, *Portuguese Society*, *University of Bristol* **Sep 2024 – May 2026**

- Re-established the society after a 3-year hiatus, growing membership to 45 students and securing Bronze Accreditation from the Students' Union
- Secured a £100 grant, doubled the budget and negotiated a sponsorship with a local club

SKILLS

Design & Analysis: Hand Calculations, CAD and Technical Drawings (Autodesk Fusion, Siemens NX), FEA and Motion Analysis (Siemens NX, ABAQUS CAE), Thermal and Heat Transfer Modeling, DFM, BOMs, PDS/PSS Documentation, GD&T (course in progress)

Prototyping & Fabrication: Rapid Prototyping, 3D Printing (UltiMaker Cura, Formlabs), Laser Cutting (Epilog, Trotec, CorelDRAW), Assembly, Plastics Quality Testing, Sensor Circuits; introductory workshop training in milling, turning and soldering

Manufacturing Exposure: Plastics (injection molding, extrusion; plant visits), Aerospace Engine Maintenance (shop observation)

Programming & Controls: Python (data analysis, signal processing), MATLAB, Arduino IDE

Soft Skills: Team Leadership, Cross-Functional Collaboration, Technical Documentation

Languages: Portuguese (Native), English (Fluent), Spanish (Conversational), French (A2)