

Morgan Doane

Interdisciplinary Product Engineer · Hardware × Software × Design

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EXPERIENCE

Full Stack Product Engineer University of Utah 2023 – Present

- Designed and built CampusLab, an AI platform for institutional-scale course feedback analysis; processing 2.4M student comments across 12k courses university-wide.
- Shipped full-stack production application (React, TypeScript, NestJS, MongoDB, Redis, GCP) with a custom Python NLP pipeline (embeddings, clustering, sentiment) for non-technical users.
- Built AI agent workflows (Vercel AI SDK and Gateway) giving administrators conversational access to large qualitative datasets through structured tool use.
- Co-founded a company around the platform with two partners; currently in licensing negotiations with the university. Secured \$140k commercialization grant and is actively pursuing external pilots at peer institutions.

Mechanical Designer & Full Stack Engineer Little Dutch Boy Bakeries 2019 – 2022

- Designed full mechanical conveyor systems including stainless steel weldments, motor and drive train selection, supporting ~100k-cookie batches for facilities supplying 5000+ Walmart & Aldi locations nationwide.
- Owned complete BOMs and coordinated directly with laser cutting, rolling, welding, machining fabricators; redesigned modular conveyor architecture to cut build time by 50%.
- Built parametric design-automation software (TypeScript, Node.js) that encoded conveyor assembly logic in code, syncing directly to SolidWorks global variables and eliminating manual CAD rework when system parameters changed.
- Designed and deployed a separate full-stack operations platform (React, GraphQL, MongoDB, Redis, Neo4j) for procurement, warehouse ops, and food traceability.

Teaching Fellow Harvard Graduate School of Design 2025 – Present

- Mentor interdisciplinary teams through iterative prototyping on complex open-ended problems - providing both hardware feedback during pin-ups and hands-on technical scaffolding (APIs, databases, UI) for teams building working prototypes.

PROJECTS

Sunwell - Deployable Solar Array Harvard MDE Thesis 2025 – Present

- Co-designing a modular, portable solar array for disaster response - addressing the fragility of diesel generator supply chains after major storms.
- Leading design research, mechanical design, and iterative prototyping; system is designed to scale from powering a single appliance to supporting a field health clinic.

US Energy Map Portfolio 2024

- Built an interactive data visualization tool rendering the US energy grid - power plant capacity, energy mix, and renewable penetration - at national and neighborhood scale, sourced from EIA data.
- Designed with explicit attention to the subjectivity of data visualization; the tool makes complex infrastructure legible without editorial bias.

Cryogenic 3D Printer Portfolio 2023

- Designed and built a custom delta-format 3D printer - frame, motion system, electronics, firmware, and bespoke G-code pipeline - capable of fabricating temporary ice structures as an experimental material medium.

ColdForm - Wearable Cooling System Portfolio 2023

- Designed a wearable heat-stroke prevention system for roofers, integrating compressed air, a vortex tube, and phase change material to deliver up to 1.5 hours of core-body cooling, rechargeable in 5 minutes from the roofer's existing air line.

- Grounded in deep field research into the roofing industry's incentive structure, labor dynamics, and working conditions; the design prioritizes adoption by fitting seamlessly into existing workflows.

EDUCATION

MS, Design Engineering Harvard University 2024 – Present

BS, Multidisciplinary Design University of Utah 2020 – 2024

SKILLS

Software: TypeScript, Python, React, NestJS, GraphQL, MongoDB, Redis, Neo4j, GCP, Vercel

Hardware: SolidWorks (expert), Rhino, Fusion 360, KeyShot, mechanical systems, BOM management, DFM, stainless steel weldments

Fabrication: 3D printing, laser cutting, woodworking, iterative prototyping

Data / ML: NLP pipelines, embeddings, clustering, AI agents, data visualization

Methods: End-to-end product ownership, design research, rapid iteration, supplier coordination