

# John Bovard

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## Summary

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Frontend engineer and HCI researcher with an MS in Human-Centered Computing and a BS in Computer Science. I build accessible, well-crafted web interfaces grounded in a genuine understanding of how people use software — shaped by years of formal UX research across academic and interdisciplinary settings. Comfortable across the full stack, with a focus on the frontend and the user.

## Skills

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- **Languages:** TypeScript, JavaScript, Python, C#, SQL, Kotlin, C, MATLAB
- **Frontend:** React, Next.js, Tailwind CSS, D3.js, HTML5, CSS3, Bootstrap
- **Backend:** ASP.NET Core, Node.js, REST APIs, Entity Framework Core
- **Databases:** PostgreSQL, SQL Server, MySQL, Supabase, MongoDB
- **Cloud & DevOps:** AWS EC2, Vercel, Docker, GitHub Actions, CI/CD Pipelines
- **Practices:** Accessibility, usability testing, MVC architecture, relational schema design, Agile
- **UX Research:** Semi-structured interviews, diary studies, thematic analysis, heuristic evaluation, usability testing, contextual inquiry, rapid iterative prototyping

## Education

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- University of Utah**, MS Computing (Human-Centered Computing) May 2025
- University of Utah**, BS Computer Science May 2023  
(Certificates: Web/Mobile Development, Visual Computing, Information)
- University of Iowa**, BA English, Minor in Chemistry Dec 2018

## Experience

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- Research Assistant**, University of Utah, MICA Lab – Salt Lake City, UT Aug 2023 – May 2025
  - Architected and implemented an automated MRI Region-of-Interest (ROI) analysis pipeline in Python, replacing manual radiological workflows.
  - Designed clustering-based MRI standardization method to improve ROI consistency across heterogeneous imaging datasets.
  - Reduced analysis time to under 1 minute per MRI (~180x faster than traditional manual review).
  - Collaborated with biomedical engineers, radiologists, and data scientists to refine technical requirements and interpret analytical outputs.
  - Developed CLI-based tooling to support reproducible batch processing of large imaging datasets.
- Research Assistant**, University of Utah, Focused Ultrasound Lab – Salt Lake City, UT June 2023 – Aug 2023
  - Assisted in integration of a Hybrid-Angular Spectrum algorithm into the Kranion treatment planning platform.
  - Debugged and validated computational integration using MATLAB-based simulations.
  - Conducted validation testing to ensure correctness and numerical stability of algorithm outputs.
  - Worked alongside biomedical engineers and radiologists to align algorithm implementation with clinical use cases.
- Research Assistant**, University of Utah, PeDEL Lab – Salt Lake City, UT Aug 2022 – Aug 2023
  - Analyzed semi-structured interviews and diary studies investigating time management challenges in distributed work.
  - Performed thematic coding and qualitative synthesis to extract recurring behavioral patterns.
  - Translated behavioral findings into structured design requirements for AI-assisted productivity systems.
  - Authored and defended Bachelor's thesis synthesizing research findings and system-level design proposals.
- Research Assistant**, University of Utah, Code in Context Lab – Salt Lake City, UT May 2022 – Aug 2022
  - Contributed to a systematic literature review supporting a 2024 research publication in *ACM Transactions on Computing Education* with 85+ citations.

## UX Research Projects

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- Rotational Focus Strategies – Digital Health UX Research** Apr 2025  
*TypeScript, React, Next.js, PostgreSQL, Supabase, Tailwind CSS, Vercel | Independent Graduate Research Project*
  - Designed and built a full-stack web application to investigate rotational focus strategies as a literature-backed digital health intervention for productivity and attention management.
  - Conducted usability testing and rapid iterative prototyping to refine interaction design based on participant feedback.
  - Designed relational schema to support user-scoped workflows, temporal activity tracking, and strategy-performance analytics.
  - Implemented asynchronous API flows and error-handling patterns to maintain UI responsiveness during data mutations.

- Deployed production build via Vercel with environment variable management and secure configuration practices.

## **Shared Space Reservation Systems – UX Research**

Dec 2023

*Semi-structured Interviews, Crowdsourced Survey (Prolific), Thematic Analysis | Team of Three*

- Conducted a mixed-methods study combining semi-structured interviews (N=6) and a crowdsourced Prolific survey (N=16) to investigate user experiences with shared space reservation systems.
- Performed thematic analysis across 201 coded interview quotes, synthesizing findings collaboratively in Miro to identify recurring usability failures.
- Identified core failure patterns including poor availability visibility, obfuscated space information, inadequate support for stressed users, and privacy concerns around exposed user data.
- Developed a structured set of design considerations across three dimensions: user interaction, knowledge acquisition, and alignment with human behavior and cultural norms.

## **GradTracker Website Redesign**

Dec 2021

*Contextual Inquiry, Heuristic Evaluation, Prototyping, Usability Testing | Team of Three*

- Conducted contextual inquiry to observe how students navigated degree tracking workflows in their natural context.
- Performed heuristic evaluation identifying violations of established usability principles (visibility, feedback, error prevention).
- Designed low- and mid-fidelity prototypes and iteratively refined based on user testing sessions.
- Proposed interface redesign balancing cognitive load reduction with system data constraints.

## **Engineering Projects**

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### **Cinematic MRI Visualization Pipeline**

Apr 2024

*Python, ParaView, 3D Slicer, MedSAM, Houdini | Team of Three*

- Built a multi-tool pipeline to segment, visualize, and animate time-series MRI lung and liver datasets sourced from ETH Zürich.
- Performed feature segmentation of lung MRI data using 3D Slicer's Segment Editor, iteratively refining segmentations to isolate anatomical structures from noisy imaging data.
- Optimized the segmentation workflow by reusing prior-timestep segmentations as starting points, reducing per-dataset processing time from ~45 to ~20 minutes.
- Integrated MedSAM's AI-assisted segmentation for liver data, manually cleaning outputs to resolve ambiguous anatomical boundaries.
- Contributed to Python scripting for data format conversion and camera path import/export between ParaView and Houdini.

### **Utah Digital Newspapers Visualizations Dashboard**

Dec 2023

*JavaScript, D3.js, HTML5, CSS3 | Team of Two*

- Designed modular D3.js visualization components with reusable chart logic and dynamic state updates.
- Implemented interactive filtering and timeline controls enabling multi-dimensional exploration of archival datasets.
- Applied accessibility best practices including optimized color contrast, semantic labeling, and interaction feedback.
- Built client-side data normalization workflows to clean and structure raw API responses for visualization readiness.

### **TA Application Portal – ASP.NET Core Web Application**

Dec 2022

*C#, ASP.NET Core, SQL Server, Entity Framework Core, Bootstrap, AWS EC2 | Team of Two*

- Structured application using MVC architecture with clear separation between controllers, services, and data access layers.
- Designed role-based authorization logic to restrict administrative workflows and reviewer visibility.
- Configured AWS EC2 instance for hosting, including server setup, runtime configuration, and deployment troubleshooting.
- Conducted integration testing to validate multi-role workflows and database consistency.

### **Learning Management System Server**

Apr 2022

*C#, ASP.NET Core, MySQL, Entity Framework Core | Team of Two*

- Designed normalized relational schema supporting courses, enrollments, assignments, and grade tracking with referential constraints.
- Implemented LINQ query optimizations to reduce redundant database calls and improve response efficiency.
- Applied dependency injection principles to decouple services and improve maintainability.
- Identified early schema design limitations and refactored relationships to support evolving feature requirements.
- Configured and deployed ASP.NET Core backend to AWS EC2, managing environment variables, database connection strings, and server runtime configuration.