

# John Bovard

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## Summary

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Full-stack and UX engineer with a background in HCI and medical imaging research and an MS in Human-Centered Computing. I build accessible, thoughtful applications using React, TypeScript, and PostgreSQL, grounded in user research—from interviews and usability testing through to production code.

## Skills

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- **Languages:** TypeScript, JavaScript, Python, C#, SQL, Kotlin, C, MATLAB, C++
- **Frontend:** React, Next.js, Tailwind CSS, D3.js, HTML5, CSS3
- **Backend:** ASP.NET Core, Node.js, REST APIs, Entity Framework Core
- **Databases:** PostgreSQL, Supabase, SQL Server, MySQL, MongoDB
- **Cloud & DevOps:** Vercel, AWS EC2, Docker, GitHub Actions, CI/CD Pipelines
- **UX Research:** Semi-structured Interviews, Diary Studies, Usability Testing, Contextual Inquiry, Thematic Analysis, Rapid Iterative Prototyping
- **Practices:** Agile/Scrum, Git, WCAG Accessibility Auditing, Cross-functional Collaboration

## Experience

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**Research Assistant**, University of Utah, MICA Lab – Salt Lake City, UT Aug 2023 – Apr 2025

- Developed an automated MRI Region-of-Interest (ROI) analysis pipeline in Python to replace manual radiological review workflows.
- Designed a clustering-based MRI standardization method and applied histogram matching techniques to improve consistency of disease marker detection.
- Reduced analysis time to under 1 minute per MRI scan (approximately 180x faster than manual workflows) through iterative algorithm refinement.
- Built CLI tooling to support reproducible batch processing of large imaging datasets.
- Collaborated with biomedical engineers, radiologists, and data scientists to translate domain research goals into computational workflows.

**Research Assistant**, University of Utah, Focused Ultrasound Lab – Salt Lake City, UT Jun 2023 – Aug 2023

- Assisted in integrating a signal-processing algorithm into a clinical treatment-planning platform; conducted MATLAB-based validation testing.
- Collaborated with biomedical engineers and radiologists to align implementation with clinical use cases.

**Undergraduate Research Assistant**, University of Utah, PeDEL Lab – Salt Lake City, UT Aug 2022 – Aug 2023

- Performed thematic analysis on semi-structured interview and diary study data on distributed work behavior; translated findings into design implications for AI-assisted productivity systems (BS thesis).

**Undergraduate Research Assistant**, University of Utah, Code in Context Lab – Salt Lake City, UT May 2022 – Aug 2022

- Contributed to a systematic literature review under doctoral supervision supporting a 2024 publication in ACM Transactions on Computing Education (acknowledged contributor; 92 citations).

## Projects

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**Rotational Focus Strategies – Full-Stack Web Application** Apr 2025 – Jul 2026

*React, TypeScript, Next.js, PostgreSQL, Supabase, Clerk Auth, PWA, Vercel | Independent Project*

- Designed database schema and implemented PostgreSQL Row-Level Security (RLS) policies via Clerk-issued JWTs, enforcing user-scoped data access at the database layer.
- Built a focus and productivity PWA targeting ADHD users, incorporating usability testing and iterative design based on user feedback.
- Conducted a full WCAG AAA accessibility audit and led a visual redesign establishing a unified, accessible design system.
- Deployed to production via Vercel; upgraded core dependencies (Next.js 16, React 19, Tailwind CSS 4, Clerk 7) across the stack.

**Portfolio Website – johnbovard.dev** Feb 2026 – Present

*Next.js, TypeScript, MDX, Tailwind CSS, Vercel | Independent Project*

- Conducted two WCAG AA accessibility audits, measuring and documenting contrast ratios and fixing keyboard navigation and focus management issues sitewide.
- Diagnosed and resolved production Lighthouse performance regressions, raising the Performance score from 78 to 99.
- Designed and documented a component-level design system, with written rationale for each decision.

## Utah Digital Newspapers Visualizations Dashboard

Sept – Dec 2023

JavaScript, D3.js, Data Processing, Accessibility | Team of Two

- Designed modular D3.js visualization components with reusable chart logic and dynamic state updates for exploring archival newspaper data.
- Built client-side data normalization workflows and aggregation logic to transform raw archival datasets for temporal and geographic analysis.
- Applied accessibility best practices, including optimized color contrast and semantic labeling, and iterated on layout based on user testing feedback.

## Reservation System UX Analysis

Oct – Dec 2023

Semi-structured Interviews, User Surveys, HCI Research | Team of Three

- Designed interview protocols and survey instruments to capture diverse user scenarios while minimizing bias.
- Synthesized qualitative findings into structured usability problem statements, identifying recurring failures in availability visibility and booking transparency.
- Translated research findings into prioritized design recommendations, accounting for technical constraints such as concurrency conflicts and calendar synchronization.

## TA Application Portal – ASP.NET Core

Sept 2022 – Dec 2022

C#, SQL Server, Entity Framework Core, Bootstrap, AWS EC2 | Team of Two

- Structured the application using MVC architecture with separation of concerns between controllers, services, and data access layers.
- Designed role-based authorization logic to restrict administrative workflows and reviewer visibility.
- Configured and deployed to AWS EC2, managing environment variables and connection strings.

## Learning Management System Server

Mar – Apr 2022

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

- Designed a normalized relational schema supporting courses, enrollments, assignments, and grade tracking with referential constraints.
- Applied dependency injection to decouple services and implemented LINQ query optimizations to reduce redundant database calls.
- Configured and deployed the backend to AWS EC2, managing environment variables and database connection strings.

## GradTracker Website Redesign

Sept – Dec 2021

Contextual Inquiry, Paper Prototyping, Think-Aloud Usability Testing, Information Architecture | Team of Three

- Conducted contextual inquiry and affinity diagramming to surface workflow friction and information hierarchy issues.
- Designed low- and mid-fidelity paper prototypes, iteratively refined across multiple think-aloud usability testing rounds.
- Delivered an implementation roadmap outlining frontend and backend coordination requirements for stakeholder handoff.

## Publications

- McNutt, He, Kamaraj, Bambrro, Jadidi, **Bovard**, Han. *Teaching Critical Visualization: A Field Report*. EduVis 2025 (IEEE VIS Workshop on Visualization Education). arXiv:2508.02592.

## Education

University of Utah, MS Computing – Human-Centered Computing

May 2025

University of Utah, BS Computer Science Certificates: Web/Mobile Development, Visual Computing

May 2023

University of Iowa, BA English, Minor in Chemistry

Dec 2018