Dan Cascaval

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EXPERIENCE

Director of Software Engineering, Branch3D 2023 - present

- Joined as a developer, promoted to Technical lead and later Director. Set and executed technical direction for a startup team of 8. Built and led an interdisciplinary development team, set up software practices, led hiring, while serving as the lead individual contributor.
- Developed internal-facing systems (C# / Rhino) to create and review fabrication models of buildings: making a 3D model with 1M+ parts not just load, but be interactive, usable, introspectable. Worked directly with industry users: this tool powers 100% of the projects Structurecraft has fabricated since December 2023 (80+, over 2M sq.ft. of built mass-timber construction)
- Built Branch Concept from idea to launch in an initial 2.5 month spike, pre-agents. Concept design tool for architects & engineers: push/pull on the faces of a building and the structure is regenerated, with structural analysis & embodied carbon update in real-time. Deployed pilots to 20+ organizations.
- Strong focus on performance / UI / UX. Fast dynamic geometry generates buildings with tens of thousands of elements at frame-rate in the browser, custom action system, responsive updates, novel modeling system based on my PhD research, visualizing building-scale & complexity data through many different lenses. Local-first React Three Fiber / WebGPU app.
- Shipped an agentic extension system where the software itself can be shaped and composed by the users themselves with AI agents over MCP, performed automated analysis over traces to improve the harness and overall user experience.

PhD Candidate, University of Washington 2020 - 2023

- Completed three years of a Computer Science PhD program, co-advised between PL and Computer Graphics. First-author papers at PLDI (*A Lineage-Based Referencing DSL for Computer-Aided Design*) and EUROGRAPHICS (*Differentiable 3D CAD Programs for Bidirectional Editing*); mentored BS/MS students.
- Core project was a domain-specific language for representing 3D CAD models that can both be generated by a program and edited by a human. Lots of approaches: classical AI, program synthesis, autodiff, constraint-solving, etc to enable a mix of direct interaction and automatic design optimization.
- Implemented compiler front/backends, solver-aided tools, parametric 3D modeling engines, global and local nonlinear optimization, JIT-compilation, and a 3D web-based interface to all of it.

Software Engineer, Join Inc 2019 - 2020

- #6 employee, startup building web-based tooling for architects, building owners to collaborate during building pre-construction. Joined as we scaled from a single-digit daily users to tens of companies actively on the platform.
- Developed heavily-interactive components (web-based table editor familiar to Excel power-users, interactive charts, lots of data) in React / Typescript; focus on performance as an enabling feature.

TECH STACK

Frontend	React / React Three Fiber / Solid / Three.js / WebGPU
Languages	Typescript / Scala / Python / C# / F# / Rust / OCaml / Racket / C++ / SQL
Backend	Postgres / Docker / Node

EDUCATION

MS, Computer Science	University of Washington	2020 - 2022
BA, Computer Science, Architecture	Carnegie Mellon University	2015 - 2019