Charles Beck

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Education

University of Michigan | *Bachelor of Science in Computer Science* Ann Arbor, MI | Expected May 2027
Coursework: Data Structures & Algorithms, Software Engineering, Web Systems, Databases, Artificial Intelligence

Experience

Rivian and Volkswagen Group Technologies May 2026 - Aug 2026
Software Engineering Intern, Fleet Applications *Palo Alto, CA*

- Shipped an internal feature-flagging platform from empty repo to production, letting teams launch or roll back features without a ~**15-minute redeploy**; rolled out to the Fleet Applications team, with **2 additional teams** onboarding.
- Built the flag evaluation engine and a dependency-free **TypeScript** SDK (boolean, tenant-allowlist, attribute, and percentage-rollout targeting) whose caching client evaluates locally, adding **no network call per flag check**.
- Centralized the data model in one **NestJS**/**Postgres** REST writer with thin regional **GraphQL** proxies, ending per-region data drift and making a new region a **values-file change**.
- Built the **React** admin UI as a federated micro-frontend (Module Federation, Nx) for managing flags across **4 environments**: targeting rules, scheduled launches, and promotion between environments.

U-M CAEN (Multidisciplinary Design Program) Jan 2026 - Present
Software Engineering Fellow *Ann Arbor, MI*

- Built and deployed a full-stack Google Workspace app (**FastAPI**, **Next.js**, Google OAuth) that reclaims Drive storage via duplicate detection and bulk file actions, now in pilot ahead of campus-wide release to ~**100k U-M users**.
- Set up the team's engineering workflow (**CI/CD** pipelines, CODEOWNERS-gated pull-request review, issue tracking) and configured **AWS** Amplify and App Runner deployments.

Capoom (Perot Jain TechLab @ Mcity) Aug 2025 - Dec 2025
Software Engineering Fellow, ML Infrastructure *Ann Arbor, MI*

- Cut per-camera training memory from ~**12 MB to ~1 KB** by building a constant-memory mode for 3D Gaussian Splatting (lazy disk-backed loading with an LRU cache), scaling training to a **33k-image** city-scale dataset.
- Added open-vocabulary 3D segmentation (GroundingDINO + SAM) and an asset-extraction pipeline for synthetic AV scenes; ran ~50 distributed **SLURM** jobs, chaining multi-day runs past the cluster's wall-time limit.

Yazaki North America May 2025 - Aug 2025
Software Engineering Intern *Canton, MI*

- Cut a manual PDF-to-Excel process from ~**1 hour to under a minute** by building a **Python** ETL pipeline (pdfplumber, pandas) with redline detection, Japanese/English normalization, and idempotent **SQLite** ingestion.

Michigan Mars Rover Project Team Jan 2025 - Sep 2025
Software Engineer, Autonomous Navigation *Ann Arbor, MI*

- Built the long-range navigation module of the rover's **ROS 2** autonomy stack, tracking distant markers with bearing-only estimation and debouncing to hold trajectory under intermittent visibility.

Projects

CivicPass: Benefits Eligibility Platform | *Next.js, React, TypeScript, OpenAI* **1st Place**, Google x T4SG

- Built the full codebase on a 4-person team; the app checks residents against **20** Michigan and federal benefit programs from one 60-second profile (live at civic-pass-hazel.vercel.app).
- Shipped a public /api/eligibility endpoint for agencies and a real-time "benefit-cliff" income simulator.

Concord: AI Trip Coordinator | *Python, FastAPI, Gemini, ChromaDB* **1st Place ($2,000)**, MHacks 2025

- Turns group email threads into structured itineraries via AgentMail inboxes and an async FastAPI webhook.

EECS Guru: Grade Calculator | *Next.js, React, Supabase* | eecs.guru Feb 2025 - Present

- Launched a grade-forecasting app for U-M EECS students: ~**200 users**, ~**85%** arriving via organic search.
- Engineered local-first sync (localStorage plus debounced Postgres writes) and a full test pyramid (**Jest**, **Playwright**, axe-core) gated by CI and pre-commit hooks.

Technical Skills

Languages: TypeScript, JavaScript, Python, C/C++, Java, SQL, HTML/CSS
Frameworks: React, Next.js, Node.js, NestJS, FastAPI, GraphQL, REST APIs, Module Federation, pandas, ROS 2
Data & Infrastructure: PostgreSQL, SQLite, Supabase, AWS (Amplify, App Runner), Docker, CI/CD, Linux, SLURM
Tools: Git, Nx, Jest, Playwright, Claude Code (AI-assisted development)