Charles Beck

(248) 860-1227 | chabeck@umich.edu | linkedin.com/in/chabeck | github.com/chabeck1 | charliebeck.xyz

Education

University of Michigan — Ann Arbor, MI
B.S. in Computer Science — *Aug. 2023 – May 2027*
- **Coursework:** Data Structures & Algorithms, Computer Architecture, Databases, Web Systems, Software Engineering, Artificial Intelligence.

Experience

Rivian and Volkswagen Group Technologies — May 2026 – Aug. 2026
Software Engineering Intern, Fleet Applications — *Palo Alto, CA*
- Building a full-stack **feature flag** system for fleet applications, enabling safe rollout and gating new features.
- Shipping it end-to-end across the frontend, API, and data layers, with tests integrated into **CI/CD** pipelines.

University of Michigan – Multidisciplinary Design Program (CAEN) — Jan. 2026 – Present
Software Engineering Fellow — *Ann Arbor, MI*
- Built and deployed a full-stack Google Workspace app (**FastAPI**, **Next.js**, **AWS Amplify**) that helps University of Michigan users reclaim Drive storage via duplicate detection, bulk file actions, and cleanup.
- Implemented Google **OAuth** and a Drive indexing service backed by **Redis** caching and **PostgreSQL** (**SQLModel**).

Capoom – Perot Jain TechLab @ Mcity (University of Michigan) — Aug. 2025 – Dec. 2025
Software Engineering Fellow — *Ann Arbor, MI*
- Built a **constant-memory** training mode for **3D Gaussian Splatting** (lazy disk-backed loading + an LRU cache) that cut per-camera memory from ∼12MB to ∼1KB, scaling training to a **33k-image** city-scale dataset.
- Added open-vocabulary 3D segmentation (**GroundingDINO** + **SAM**) and a 3D asset-extraction pipeline for synthetic AV scenes; ran ∼50 distributed **SLURM** training jobs, including chained multi-day runs past the cluster's wall-time limit.

Yazaki North America — May 2025 – Aug. 2025
Software Engineering Intern — *Canton, MI*
- Engineered a **Python** ETL pipeline (**pdfplumber**, **pandas**) that replaced a manual process — parsing complex multi-variant manufacturing PDFs into formatted Excel with redline detection, Japanese/English text normalization, and idempotent **SQLite** ingestion.
- Built a fault-tolerant polling service that ingests calendar events, resolves attendees against the engineering PLM system, and auto-files tracking issues with retry-safe state transitions.

Michigan Mars Rover Project Team — Jan. 2025 – Sep. 2025
Software Engineer – Autonomous Navigation — *Ann Arbor, MI*
- Engineered the long-range navigation module of the rover's **ROS 2** autonomy stack in **Python**, 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 × T4SG
- Checks residents against **20 real** Michigan/federal benefit programs (SNAP, Medicaid, Pell, Section 8) from a single 60-second profile.
- Shipped a public `/api/eligibility` endpoint for government agencies and a real-time "benefit-cliff" income simulator spanning all 20 programs.

Concord: AI Trip Coordinator | *Python, FastAPI, Gemini, ChromaDB* — **1st Place ($2k)** – MHacks 2025
- Email-in, itinerary-out AI trip planner that turns unstructured group email chains into a structured plan.
- Built on **AgentMail** inboxes + an async **FastAPI** webhook service feeding a **ChromaDB** + **Google Gemini** RAG layer that emits a strict **Pydantic** schema.

EECS Guru: Grade Calculator | *Next.js, React, Supabase* | eecs.guru — Feb. 2025 – Present
- Built and shipped a full-stack grade-forecasting app (**Next.js 16**, **React 19**, **Supabase**) for U-M EECS students — live on **Vercel** with ∼200 users across 7 countries, ∼85% via organic search.
- Engineered local-first sync (localStorage + debounced Postgres writes) and a full test pyramid — **Jest**, **Playwright**, **axe-core** — gated by CI and pre-commit hooks.

Technical Skills

Languages: Python, TypeScript, C/C++, Java, SQL
Frameworks & Tools: React, Next.js, FastAPI, Flask, ROS 2, pandas, PostgreSQL, Supabase, Redis, ChromaDB, Docker, AWS, Vercel, SLURM, Git, CI/CD