Tim Hannifan

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Summary

Software engineer and data scientist who turns research into production systems people actually use—data pipelines, full-stack web apps, and agentic AI. Currently at the University of Chicago Data Science Institute, shipping software for partners across industry, government, and non-profits. Came up the unusual way: derivatives trading desk to self-taught full-stack to a UChicago data science degree. At home in messy real-world data, large existing codebases, and constraints that don't bend.

Education

MS **University of Chicago, Computational Analysis and Public Policy** — Dec 2020
Department of Computer Science and Harris School of Public Policy — Chicago, IL

BA **University of Chicago, Economics** — June 2008
Chicago, IL

Experience

Research Software Engineer — Dec 2021 – present
University of Chicago Data Science Institute — Chicago, IL

- Architect and ship production-grade software across multiple concurrent research projects with industry, public sector, and non-profit partners—data pipelines, web applications, APIs, machine learning systems, and analytics platforms in Python, SQL, Docker, and AWS—establishing engineering best practices including version control, automated testing, and CI/CD
- Built ClimateCast, an interactive climate and risk reporting web application generating ZIP-level reports across the continental U.S.; engineered a reproducible Python pipeline fusing eight federal and academic datasets (WorldClim, CMIP6, NOAA, EPA, Census) into ~70,000 idempotently-built static reports, served by a Next.js/TypeScript front end deployed on Cloudflare
- Built Accountability Advisor, an AI tool using retrieval-augmented generation (RAG) over a curated library of policy and procedural documents to turn plain-language descriptions into submission-ready complaints, lowering barriers to formal accountability processes; developed with Next.js, Cloudflare Workers, and Neon Postgres
- Delivered additional research partnerships including agentic AI applications for frontier LLM optimization (Morningstar), a machine learning platform for tract-level housing market analysis (City of Chicago), deep research AI systems (Argonne National Laboratory), and an agentic RAG tutoring chatbot as lead engineer for the AI in Education Working Group

Data Science Fellow — June 2019 – Sept 2019
Mathematica Policy Research — Princeton, NJ

- Designed and built a reusable Python package automating Latent Dirichlet Allocation (LDA) topic-modeling workflows over millions of Medicaid patient complaint records, with robust error handling, logging, and configuration management
- Delivered an automated NLP pipeline that cut time-to-insight from weeks to minutes and deployed instantly across new datasets, adopted into Mathematica's existing data science workflows with documentation and training

Data Science Consultant Apr 2016 – June 2018
The World Bank Remote

- Designed and implemented Node.js web scrapers to collect data from Malaysia's two major job sites, building ETL pipelines to aggregate hundreds of thousands of employment records into a NoSQL database (MongoDB) with automated scheduling and error handling
- Built a full-stack web analytics platform with Node.js backend APIs and interactive frontend, enabling researchers and policymakers to search, visualize, and download real-time job market data, deployed on cloud infrastructure with automated backups

Founder & Full-Stack Web Developer May 2013 – June 2018
Self-employed, TJH Media LLC New York, NY

- Founded a development shop and shipped production web applications for 10+ clients across retail, finance, and education—self-taught full-stack, owning the full lifecycle from requirements gathering to deployment
- Developed full-stack web applications, RESTful APIs, and database-backed systems using JavaScript (Node.js), SQL/NoSQL (PostgreSQL/MongoDB), and cloud infrastructure (AWS), implementing responsive frontends and scalable backend architectures

Interest Rate Derivatives Trader June 2008 – Apr 2012
Credit Suisse Securities USA New York, NY

- Managed an interest rate derivatives portfolio (swaps and futures) on a multi-billion-dollar desk, building quantitative trading strategies, risk models, and custom Excel automation tools

Skills

Research Software Engineering: Python, SQL, Docker, AWS - production data pipelines, APIs, full-stack applications

AI & Machine Learning: Predictive modeling, NLP, statistical inference, LLMs, retrieval-augmented generation, agentic systems

Engineering Practices: Git workflows, CI/CD, automated testing, system architecture, technical documentation