Nathanial Hapeman

Senior Software Engineer

Los Angeles, CA

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Portfolio: nhapeman.com
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github.com/nate-h

Summary

Senior Software Engineer with 11 years of experience building performance-critical systems across hardware testing, machine learning, and geospatial domains, with experience leading fullstack projects.

Skills

Frontend: TypeScript, Javascript, Vue, React, Angular, CSS, Sass, HTML, UI/UX, Plotly, Jest, Vitest
Backend: Python, C++, FastAPI, NumPy, Pandas, Matplotlib, PostgreSQL, Docker, gRPC, REST, Kubernetes
Others: Testing, Debugging, CI/CD, Profiling, OOP, OpenCV, SQL, Git, AWS, Parquet, HDF5, Issue Tracking

Work Experience

HRL **July 2021 – Present**
Staff Fullstack Engineer *Malibu, CA*

- Lead developer and architect on python-based automated semiconductor device testing framework
  - Doubled throughput on legacy systems while achieving near-theoretical runtimes on newer systems
  - Designed centralized control architecture enabling single-host operation of multiple probe stations
  - Built a hardware abstraction layer with instrument mocking for full CI/CD testing and rapid iteration
  - Partnered with physicists to qualify hardware, explore results, and design scalable test architectures
  - Implemented Pydantic-driven configurations, Typer-based CLIs, and MS SQL + HDF5-backed data pipelines
- Fullstack developer on real-time data acquisition and visualization platforms for quantum-relevant data
  - Created a universal, cross-network device visualizer for semiconductors using WKB polygons from a database
  - Built Monaco-based REPL frontend and Python backend with custom data serialization for experiment control
  - Implemented real-time plotting and analysis tools using Plotly, WebSockets, Vue, and IPC
  - Created tools to visualize device yield by overlaying database-aggregated test results on devices
- Recipient of 2024 HRL Award for Work Excellence on Critical Programs

Applied Invention **June 2014 – June 2021**
Senior Software Engineer *Burbank, CA*

- Computer Vision Aquaculture Project
  - Lead architect and developer on image annotation website using Angular, Flask, Postgres, AWS
  - Worked extensively with annotation team to improve the website user experience
  - Imported and cleaned training data from third party sources while working with internal annotators
  - Built dashboard to monitor and control image pipeline, track annotator performance, inspect anomalies
  - Developed multiple computer vision solutions like multi-label recognition, quality filtering, image scoring
  - Core contributor to a ML data pipeline built on Pachyderm, AWS, and Kubernetes, operating at ~400 pods
- Rental Forecasting Project
  - Added to team to resolve performance bottlenecks and expand forecasting system to nationwide scope
  - Delivered a 50x performance improvement through query optimization, parallel execution, memoization, profiling, and migrating hot paths to C++
  - Automated model accuracy checks and used slack bots to report discrepancies and result summaries
- Geospatial Simulation Development
  - Worked on several GIS projects using Cesium.js, UE4 based and C++ in-house engines
  - Built hotkey systems, scenario planning tools, time sliders, dynamic camera systems, custom shaders
  - Built map server diagnostics site for testing tile caching, raster/vector visualization, and drive health

Projects

Projects on my GitHub: github.com/nate-h

- Drone-C2 – Mock drone tracking application using React, TypeScript, React-Leaflet, Go, PostgreSQL, Docker
- Whirling – An AI driven music visualizer written with Python, OpenGL, NumPy, Librosa and Spleeter
- fun-with-react – A collection of small react.js projects using TypeScript, Sass, clsx
- Image-Effects – Dozens of image processing exercises using OpenCV and NumPy
- nhapeman_v5 – Fifth iteration of my portfolio website using React, Next.js, Tailwind CSS, and TypeScript
- Pacman_js & Minesweeper_js – Recreated basics of both games in pure JavaScript
- Completed all 5 Google FooBar problems – solutions are in a private repo

Super Mario Brothers Engine (c/c++ and SDL) - https://youtu.be/EMslyjWlPGo
MyTunes: A Java media player - https://youtu.be/1c4erMvMnVQ

Education

University of California, Riverside **September 2008 – December 2013**
Bachelor of Science, Mechanical Engineering
Minor in Computer Science