Nathanial Hapeman

Senior Software Engineer

Los Angeles, CA

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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: JavaScript, Vue, React, Angular, TypeScript, CSS, Sass, HTML, UI/UX,
Backend: Python, FastAPI, Flask, OpenCV, NumPy, Pandas, Plotly, Matplotlib, PostgreSQL, Docker
Others: C++, Unit Testing, Debugging, CI/CD, Profiling, SnakeViz, OOP, SQL, Git, AWS, Paquet, HDF5

Work Experience

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

- Lead developer and architect on mission-critical automated semiconductor device testing framework
  - Doubled testing throughput via optimized instrument usage and minimal code overhead
  - Support for multiple hardware configurations with parallel orchestration capabilities
  - Built hardware abstraction layer with instrument mocking for CI/CD and rapid development cycles
  - Created comprehensive demos and simulations to accelerate operator onboarding and proficiency
- Fullstack developer on real-time data acquisition and visualization platforms for quantum-relevant data
  - Developed interactive JavaScript canvas applications for complex multi-dimensional data exploration
  - Created data pipelines handling large-scale sensor telemetry with HDF5 and SQL backends
  - Implemented real-time plotting and analysis tools using Plotly and WebSockets
- 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 an image annotation website
  - Worked extensively with annotation team to improve the website user experience
  - Imported and cleaned training data from third party sources
  - Built dashboard to monitor the annotation data pipeline and annotator stats
  - Developed several computer vision solutions, one of which prevented a costly human annotation step
  - Worked on Pachyderm data pipeline that turned raw images into machine annotations
- Rental Forecasting Project
  - Helped scale rental forecasting program to run on all US locations by reducing bottlenecks
  - Optimizing involved rewriting queries, parallelizing, memoizing, NumPy and profiling
  - 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 in-house engines
  - Wrote entire file system diagnostics website for a map server
  - Added support for dynamic terrain layer switching and wrote custom shaders
  - Built a hotkey menu system that allows users to customize and define new hotkeys

Projects

Whirling: An AI Driven Music Visualizer (Python, OpenGL, NumPy, Librosa, Spleeter)

- Uses audio feature extraction and audio segmentation to parse and understand music
- Heavily optimized to run at 60fps in python by using NumPy and OpenGL
- Useful debug features like visualizing audio features and spectrograms

Super Mario Brothers Engine (c/c++ and SDL) - https://youtu.be/EMslyjWlPGo
MyTunes: A Java media player - https://youtu.be/1c4erMvMnVQ
Other projects on my GitHub: github.com/nate-h

- Drone-C2 – Mock drone tracking application using React, TypeScript, React-Leaflet, Go, PostgreSQL, Docker
- 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 – 5th 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

Education

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