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James H. Gilles

OBJECTIVE

I want to make high-performance data visualization easy and intuitive. I'm interested in connections between databases, compilers, formal verification, abstract algebra, and general-purpose UIs.

SKILLS

- Development tools, parsers and compilers, performance optimization, formal verification.
- Data visualization, data analysis, statistics, machine learning, scientific computing.
- Technical writing, presentation, teaching, technical leadership, project coordination.
- Software architecture, testing, debugging.
- Web development, UI/UX design and implementation, full-stack engineering.
- C, C++, Rust, Java, Python, Typescript, Javascript, SQL, Kotlin, C#, Haskell, others.
- CUDA/GPGPU development, DirectX & Vulkan, FPGA development.
- Docker, Kubernetes, AWS, GCP, Linux system administration.
- Formal software verification with TLA+, Coq, Lean.

EDUCATION

Massachusetts Institute of Technology ▫ *M.S. Computer Science*   [2019 - 2020]
Master of Engineering in Electrical Engineering and Computer Science, September 2020
5.0 GPA (5 point scale)

Massachusetts Institute of Technology ▫ *B.S. Computer Science, Writing*   [2014 - 2018]
Bachelor of Science in Computer Science, Minor in Writing, May 2018
4.1 GPA (5 point scale)

EXPERIENCE

Clockwork Labs ▫ *Database Performance Engineer*   [2023 -]

Developed benchmarks and performance optimizations for a distributed relational database. Integrated performance metrics and tracing into a cross-language, cross-platform toolchain. Optimized low-level storage engine and WebAssembly ABI.

Reservoir Labs ▫ *Compiler Engineer*   [2021 - 2022]

Retargeted high-performance compiler technology to a novel hardware architecture. Implemented debugging and visualization tools for the TVM compiler framework. Integrated a custom LLVM backend developed by domain experts into TVM, as well as a custom backend targeting Reservoir's proprietary polyhedral compiler.

MIT Computer Science and AI Laboratory ▫ *Research Assistant*   [2017 - 2020]

Researched computer vision and machine learning. Developed tools for visualizing and interpreting deep neural networks, working under Antonio Torralba in the MIT CSAIL Computer Vision Research Group. Developed software for training many deep neural networks in parallel using Kubernetes, Tensorflow, and GCP. Submitted a Master's thesis on compression techniques for hardened deep neural networks, working under Michael Carbin in the Programming Systems Group.

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MIT Battlecode 6.370 ▫ *Lead Engineer, Lecturer*   [2015 - 2018]

Developed the engine for the MIT Battlecode AI programming competition, in Java, Python, and Rust. Wrote and gave lectures to students enrolled in the corresponding 200+ student course. Deployed a network of web services, including a web portal and a 1000-player matchmaking system, using AWS and Docker.

Bloomberg L.P. ▫ *Software Engineering Intern*   [06/2016 - 08/2016]

Built an A/B testing system on top of Bloomberg's proprietary software stack. Wrote tools to help engineers plan and execute experiments on the UI of their software, and to automatically perform statistical analysis on their experimental results.

Google Inc. ▫ *Software Engineering Intern*   [05/2015 - 08/2015]

Integrated third-party developer tools into Google AppEngine, including Phabricator, Jenkins, and Codiad. Implemented a distributed system for build artifact synchronization in Go.

Processing Foundation ▫ *Software Engineering Intern*   [06/2014 - 09/2014]

Integrated Python into the Processing development environment as a collaboration between the Processing Foundation and Carnegie-Mellon University. "Python Mode" is now in use in a Carnegie Mellon introductory programming course, 15-104, "Principles of Computing for Creative Practice".

MIT Media Lab ▫ *Software Engineering Intern*   [summers, 2011 - 2014]

Worked on a wide variety of projects over 3 years of summer internships at the MIT Media Lab:

- Proof of concept web application for commentary on legal RFCs. (2013)
- Visualizations of graph datasets based on data from Facebook and cross references in the US legal code. (2013)
- Demonstration Android application which performed OAuth authentication based on tokens read from ID cards using the Android NFC API. (2012)

Open Source Development, Personal Projects ▫ *Software Engineer*   [summers, 2011 - 2014]

Contributed issues and fixes to a variety of open source projects. Worked on many small personal projects, including:

- 3D visualization mod for the game Dwarf Fortress.
- A physics engine.
- Gesture recognition software for the Xbox Kinect sensor.
- High-performance image upscaling neural networks.

Art and Writing ▫ *Amateur Writer, Artist*   [ongoing]

Wrote short stories, poetry, and novellas; filled many sketchbooks. Wrote a blog featuring friendly, didactic introductions to technical concepts.

LINKS

Blog: kazimuth.github.io/blog/

Thesis: kazimuth.github.io/meng-thesis.pdf

Github: github.com/kazimuth

LinkedIn: linkedin.com/in/kazimuth