# Daren Liang

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## Work Experience

- **Citi** — New York, NY
  *Software Engineer AVP* — *July 2023 - Present*
  *Software Engineer Contract* — *May 2022 - July 2023*
  - Spearhead efforts to cut risk model execution runtimes using distributed graph computation
  - Formalize and validate risk model execution logic using JSON-serializable graphs
  - Improve an inner source distributed task scheduling framework by speeding up graph scheduling via GraphBLAS
  - Implement a compiler for a type-safe DSL aimed at facilitating faster and safer numerical computations
  - Implement a dynamic add-on framework to overlay model functions with custom logic at runtime
- **OANDA** — Toronto, ON
  *Software Developer Intern* — *May 2020 - August 2021*
  - Contributed to the OANDA's v20 trading engine as part of the execution team
  - Optimized tight loops in multi-queue ZeroMQ scenarios to reduce CPU usage and improve responsiveness
  - Investigated memory fragmentation issues with TCMalloc
  - Migrated a group of services out of a large monorepo to facilitate faster and more atomic releases

## Education

- **University of Toronto** — Toronto, ON
  *Computer Science Specialist and Applied Statistics Minor* — *September 2018 – April 2023*
  - Honours Bachelor of Science with High Distinction: 3.85/4.00 CGPA
  - University of Toronto Scholar – 2019, 2020, 2022, and 2023 Dean's List Scholar

## Involvements

- **Imglabs.io** — Toronto, ON
  *Co-Founder* — *April 2022 – Present*
  - Edge image proxy written in Rust and deployed using WebAssembly to bring image processing closer to end users
  - Currently in production with commercial customers
  - Heavily optimized image processing for sub-second image transformations in resource-constrained environments
  - Serverless architecture for cost-conscious, effortless scaling and deployment to 275+ network edge locations
  - Technologies used: Rust, WebAssembly, JavaScript/TypeScript, React, Next.js, Tailwind CSS, Cloudflare Workers Platform, AWS S3, ClickHouse, Grafana, Supabase, GoTrue, PostgreSQL, PostgREST, Docker, Stripe

## Projects

- **Dsfs** (`darenliang/dsfs`): A highly-experimental filesystem in userspace using FUSE with an exotic backend
  - Exotic backend: Files, folders, and transactions are stored using Discord attachments
  - Append-only log-structured filesystem: Supports automatic snapshots and rollback
  - Realtime synchronization: Syncing files and folders between remote clients in realtime
  - Performance optimizations: A variety of techniques are used such as buffering and checksums to ensure there are no unnecessary uploads/downloads and the differences between local and remote states are minimal
  - Cross-platform support: Supports major OSes such as Windows, macOS, and Linux
- **Nikel API** (`nikel-api/nikel`): Free and open data API for the University of Toronto
- **MikuBot** (`darenliang/MikuBot`): General purpose Discord bot serving more than 9,000 servers (discontinued)
- **Quteman** (`darenliang/quteman`): A simple Postman alternative written in C++ and Qt
- **Resauce** (`darenliang/resauce`): A work-in-progress file rename utility written in C++ and Qt

## Skills

- **Languages**: Python, Go, C/C++, Rust, JavaScript/TypeScript, Java, Scala
- **Assessments**: CodeSignal: 600/600