

## WORK EXPERIENCE

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- **Citi** New York, NY  
*Software Engineer AVP - Risk Analytics Products* July 2023 - Present  
*Software Engineer Contract* May 2022 - July 2023
  - Build the initial implementation of Citi's new vectorized risk ratings engine used across the firm's portfolio
  - Lead efforts to cut wholesale loss model runtimes by 90%+ using distributed graph computation
  - Detect schema incompatibilities and logic errors ahead-of-time in risk models encoded as JSON-serializable graphs
  - Build a compiler for a type-safe DSL with UDF support for faster and safer numerical computations
  - Build an add-on framework to apply region-specific wholesale loss model logic at runtime
- **OANDA** Toronto, ON  
*Software Developer Intern - Trading Engine / Execution* May 2020 - August 2021
  - Optimize polling logic in multi-queue ZeroMQ cases to reduce CPU usage by 90%+ and improve responsiveness
  - Investigate memory fragmentation issues in TCMalloc for long running processes with high memory usage
  - Improve stability of reporting and notification services running on Twitter Finagle
  - Migrate a group of services out of a large monorepo to facilitate faster and more atomic releases

## EDUCATION

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- **University of Toronto** Toronto, ON  
*Bachelor's Degree - 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

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- **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
  - Software stack: Rust, WebAssembly, JavaScript, React, Next.js, Tailwind CSS, Cloudflare Workers, AWS S3, ClickHouse, Prometheus, Grafana, Supabase, GoTrue, PostgreSQL, PostgREST, Docker, JWT, Stripe

## PROJECTS

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- **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

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