



# Nathan Esau

## Software Engineer

github: [nathanesau](#)  
website: [nathanesau](#)  
location: Toronto, ON

linkedin: [nathanesau](#)  
phone: 778-323-5310  
email: [nathanesau1@gmail.com](mailto:nathanesau1@gmail.com)

Backend developer with 4 years of experience. Skilled with C++, Python and Java. Knowledgeable about system design, desktop development, building web apis. 3 years of experience working in financial software, 1 year of experience in retail software.

## Skills

**Languages:** C++ (4 years), Python (4 years), Java (3 years)

**Web Frameworks:** Flask (2 years), Spring (1 year), Django (1 year)

**Other Technologies:** Docker, Qt, Nginx, Airflow, Selenium, .NET, Protobuf, Git

**Databases:** Postgres, MySQL, Redis

**Cloud:** AWS, Azure

## Education

**Simon Fraser University**, B.S in Actuarial Science, Minor Statistics

*Sept 2012 – Apr 2017*

- Interned at Statistics Canada *Jan 2015 – Apr 2015*: statistician, household surveys division
- Interned at Simon Fraser University *May 2015 – Aug 2015*: research assistant, pension plans
- Interned at Moody's Analytics *Jan 2016 – Aug 2016*: software developer, actuarial software

## Work Experience

**Software Engineer @ Nielsen**, Markham ON

*Mar 2020 – Present (1 year)*

- Worked on performance optimization of C++ microservices for Shopper Explorer Platform. Performed runtime profiling using valgrind and perf. Used caching, branch prediction and parallelism strategies. Developed tools for remote debugging, regression testing, automated deployment.
- Re-designed backend to use modern architecture. Created job scheduling system using Airflow, Postgres, Java Spring APIs for handling increased server load. Dockerized applications to simplify deployment. Added unit tests and code analysis tools for Java applications. Designed templating system using Apache Velocity for determining control flow of microservices. Used Python to monitor web services and collect server loads.
- Created test suite for performing automated end-to-end testing of Angular web-application. Used Python, Selenium and Gherkin. Wrote Flask Site for triggering tests and viewing test results. Used Redis queue workers for running background tests on site. Backed up test results to Azure blob storage.
- Moved some microservices to NoSQL database architecture. Used protocol buffer library for data serialization.

**Software Developer @ Moody's Analytics**, Toronto ON

*Jun 2017 – Mar 2020 (2 years, 9 months)*

- Developer for AXIS, an actuarial software used by life insurance companies in North America. Worked on Asset Liability Management team. Key contributor for IFRS17, US GAAP TI and credit migration projects.
- Added interface elements such as financial reports. Refactored code-base to use new C++11 and C++17 features. Wrote database code for the application.
- Designed algorithms for numerical integration, stochastic simulations, and valuing financial assets such as structured securities and fixed income securities.

## Other Experience

**Open-Source Contributions:** [musescore](#), [livesplit](#), [jsource](#), [leetcode-cli](#)

**AI Projects:** [rushhour](#), [sudoku solver](#), [TicTacToeRL](#)

**Web Projects:** [try\\_j](#), [chessapi](#), [fantasytennis](#)

**Desktop Projects:** [RookGame](#), [wstradepypapp](#)