Akira Takaki

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Education

University of Toronto September 2019 – April 2024

Honours Bachelor of Science in Computer Science & Mathematics

- GPA: 3.78
- Dean's List Scholar – Summer 2020, Winter 2021
- Relevant courses: Software Engineering, Software Design, Data Structures, Algorithms, Software Tools & Systems Programming, Numerical Analysis, Theory of Computation

Experience

Software Developer Engineer Intern May 2022 – August 2022

Amazon Web Services (AWS)

- Worked on **kubectl**, an open src command line tool for communicating with a Kubernetes cluster's control plane
- Contributed to the above tool by adding a configurable proxy that lets **kubectl** connect directly to Skylens using SIGv4 authentication, servicing 100,000+ customers
- Decreased config time by 10,000,000 minutes across all EKS customers
- Implemented a plugin to assist with the proxy, by interfacing between the client and proxy

Research Assistant July 2021 – August 2021

The Fields Institute

- Worked under Prof. Kevin Cheung to efficiently optimize arithmetic circuits by 10% computation time
- Implemented optimization algorithms, such as syntactic factorization, in `C++`, using edge and vertex elimination
- Curated data sets to test against benchmarks to measure the efficiency of our heuristics

Teaching Assistant September 2020 – April 2022

University of Toronto

- Taught several CS & Math courses, including Algorithms, Numerical Methods and Linear Algebra
- Led tutorials & practicals of 30+ students, guided classroom learning for lectures of 90+ students, marked tests and assignments for 200+ students

Executive Member September 2018 – May 2019

Mackenzie Computer Programming Team

- Organized a city-wide invitational for competitive programming, for about ∼100 teams, each with up to 4 students
- Contributed to the online judge at mcpt.ca, that runs tests against submitted code for data structures and algorithms problems

Projects

Baobab | *MongoDB, Express, React, Node*

- Built a web-based educational platform that prioritizes social networking and community engagement to facilitate learning
- Utilized **Three-Tiered** Architecture, **Jira**, **Agile** methodology, Git, and Scrum Meetings to work efficiently in a team of 8 developers
- Helped architect and make design decisions relating to the codebase and database using flowcharts, CRC diagrams, and via meetings with the product owner
- Implemented **RESTful API**s with **NestJs**, for pagination of data and file transfers, reducing loading times by 20%

PCRS: Online Programming Exercises | *Django, Liquid, Python, JavaScript*

- Worked under Prof. Andrew Petersen to create exercises for Theory of Computation, a class of ∼500 students
- Developed a web module that tests **regular expression** to DFA conversions to provide exercises for students
- Implemented the Hopcroft and subset construction algorithms for conversion between regular expression and automata

Numerical Algorithms Visualizer | *React, TypeScript, Flask, Python*

- Implemented multiple algorithms, such as Newton's method, for high precision derivative calculations in **Python**
- Used **ApexCharts** to visualize precision and to compare the algorithms

Diaphorikos | *Bootstrap, MathJax, C, CSS*

- Developed a website that uses the shunting-yard algorithm to parse a first order ODE to visualize its vector field

Technical Skills

Languages: Python (NumPy, SciPy, Matplotlib), Go, Java, C/C++, JavaScript, HTML/CSS, TypeScript, Haskell, Racket
Frameworks: React, Node.js, Flask, Django, NextJS
Databases: MongoDB, PostgreSQL, Neo4j
Tools: Docker, Kubernetes, Git, Postman, Heroku