Akira Takaki

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Education

University of Toronto Sep. 2019 – Apr 2023

HBSc. Computer Science & Mathematics

- cGPA: 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

Research Assistant July 2021 – Aug 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 Sep 2020 – Present

University of Toronto

- Taught and marked for Differential Calculus, Linear Algebra II, Intro to Mathematical Reasoning, Intro to Computer Science and Intro to Proofs
- Led tutorials & practicals of 30+ students, guided classroom learning for lectures of 90+ students, marked tests and assignments for 200+ students

VP of Internal Affairs June 2021 – Present

Mathematical and Computational Sciences Society

- Coordinated and organized social events and technical workshops for 1000+ Math, CS and Stats students

Executive Member Sep 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, which automates running tests against submitted code for data structures and algorithms problems

Projects

Baobab | *MongoDB, Express, React, Node*

- Designed a Community & E-learning platform for the African Impact Challenge, that serves 100 entrepreneurs
- Utilized **Three-Tiered** Architecture, **Jira**, **Git** flow and the **Agile** methodology, resulting in a cleaner codebase
- Implemented **RESTful API**s with **NestJs**, for pagination of data and file transfers

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

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

Transit System Emulator | *Java, JavaFX, Scene Builder*

- Created a multi-user transit system application, with Admin controls, bus-subway transfers and balance cards
- Used the **Model-View-Controller** design pattern, with **JavaFX** for the Views

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), Java, C/C++ JavaScript, HTML/CSS, TypeScript, Racket, Haskell
Frameworks: React, Node.js, Flask, Django, NextJS
Databases: MongoDB, PostgreSQL, Neo4j
Tools: Git, Postman, Heroku, Docker, VS Code, PyCharm, IntelliJ, Eclipse