Ryan Lam

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Education

University of Waterloo **September 2020 – April 2025**
Bachelor of Science; Honors Physics & Computing Minor *Waterloo, Ontario*

Coursework: Elementary Algorithm Design and Data Abstraction; Data Structures & Algorithms; Databases; Numerical Computation; Computational Physics; Probability, Statistics, and Data Analysis for Physics; Calculus 1/2/3; Linear Algebra 1

Experience

Epoch **September 2022 – December 2022**
Software Engineer Intern *Toronto, Ontario*

JamLabs Data Science **January 2022 – April 2022**
Software Test Engineer Intern *Toronto, Ontario*

- Increased test coverage from 5% to 50% by creating and implementing end-to-end test suites using Cypress
- Designed and integrated CI/CD pipelines to create test environments, seed databases, run end-to-end tests, and destroy test environments using Terraform, GitHub Actions, and AWS (Lambda, DynamoDB, S3)
- Analyzed and documented over 60 end-to-end tests via stress testing to optimize runtime and to detect test flakiness
- Created a proof-of-concept function for Cypress to use a NodeJS process and AWS SDK to upload to an S3 Bucket

Waterloo Rocketry **September 2021 – December 2021**
Software Developer *Waterloo, Ontario*

- Helped rewrite the team website using ReactJS to improve code readability and future maintainability
- Designed and helped architect a Python program that simulated the thrust of various rocket nozzles

Projects

Fast Fourier Transform Image Compressor | *Python, NumPy, Matplotlib* **July 2022**

- Compressed grayscale images using NumPy's 2D discrete Fourier Transform on 32x32 pixel sub-blocks for varying drop tolerances and drop ratios
- Computed the Fourier coefficients (FFT2) for each 32x32 pixel sub-block, removed coefficients that were lower than the drop tolerance, and computed the inverse Fourier coefficients (IFFT2) to get the compressed image
- Compressed images to 50%, 30%, 15%, and 5% of their original sizes

Fast Fourier Transform Audio Filter | *Python, NumPy, Matplotlib* **July 2022**

- Implemented a low-pass and high-pass filter on noisy audio signals using NumPy's discrete Fourier Transform module
- Derived the power spectrum to isolate high and low frequency signals in the given audio file
- Calculated the inverse FFT of the isolated frequencies to obtain the filtered audio signals

ClassAI (PolyHacks 2022 Winner) | *ExpressJS, NodeJS, VueJS, Tailwind CSS, Firebase, JavaScript* **February 2022**

- Built a classroom platform that allows teachers to upload video lectures and utilizes AssemblyAI's API to timestamp and summarize important sections in the lecture
- Automated a workflow to upload lectures in Firebase's Cloud Storage and create signed URLs for third-party APIs
- Designed the backend using ExpressJS and a NoSQL database using Firebase's Cloud Firestore

Tree Analyzer (Hack the Earth 2021 Winner) | *Django, SQLite, Python, VueJS, ChartJS* **June 2021**

- Built a web application to help forestry companies visualize forestry data and wood-cutting sustainability
- Implemented a feature that enabled users to visualize their tree data through scatter plots, bar charts, and weighted bubble charts using ChartJS

Technical Skills

Programming Languages: Python, JavaScript, HTML, CSS, C, Racket
Frameworks: NodeJS, ExpressJS, ReactJS, JestJS, Cypress, Django, Flask
Libraries: ReduxJS, Testing-Library, NumPy, SciPy, SymPy, Matplotlib, Pandas
Databases: SQL, NoSQL, SQLite, Cloud Firestore, Cloud Storage
Software & Tools: Git, GitHub, Postman, Terraform, VS Code, Jupyter Notebook/Google Colab
Other: MacOS, Windows, Microsoft Office, G Suite, LaTeX