Alan Bui

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Education

University of Waterloo (Bachelor of Computer Science) *Sept. 2024 – Present*
René Descartes National Scholarship Recipient *Waterloo, ON*
Enrolled in CS145: Designing Functional Programs (Advanced), MATH 147: Calculus 1 (Advanced)

Skills & Technologies

Languages: Python, R, Java, C++, HTML, CSS, JS, Dart
Frameworks & Tools: NumPy, pandas, sklearn, Git, React.js, Node.js, Firebase, Flutter

Research Experience

University of Windsor (Dr. Lu's Lab) *July 2023 – Aug. 2023*
Research Assistant *Windsor, ON*

– Investigated the performance of GPT and LLaMA's embeddings of Simplified Molecular Input Line Entry System (SMILES) strings for molecular property prediction and drug-drug interaction prediction
– Developed tools in **Python** to perform 30+ statistical tests using **sklearn**, **NumPy**, and **pandas**
– Worked on a team to co-author a research paper published in BMC Bioinformatics with 1500+ accesses

The effects of age on quality of mental health during the COVID-19 pandemic *July 2024*
Journal of Emerging Investigators *Windsor, ON*

– An investigation of the correlation between age and the prevalence of major depressive disorder and generalized anxiety disorder in Canada during the COVID-19 pandemic
– Analyzed and plotted linear regressions, Shapiro-Wilk tests, and Student's t-tests using **R**
– We found significant negative correlations between age and the prevalence mental health disorders

The Effects of Obesity on COVID-19 Vaccination Rates and Efficacy *Aug. 2023*
Journal of Student Research *Windsor, ON*

– An investigation of COVID-19 vaccination rates and efficacy across populations with varying obesity rates
– Analyzed linear regressions, ANOVA tests, Mann-Whitney U tests, and Student's t-tests using **R** and **Excel**
– We found that obese populations are more receptive than average in terms of COVID-19 vaccination and no statistically significant change in vaccine efficacy was observed

Achievements

Hypatia Mathematics Contest Rank 1 in Canada | University of Waterloo *Apr. 2023*
Euclid Mathematics Contest National Honour Roll | University of Waterloo *Apr. 2023*
Canadian Senior Mathematics Contest National Honour Roll | University of Waterloo *Nov. 2022*
Canadian Computing Competition Senior National Honour Roll | University of Waterloo *Feb. 2022*

Projects

www.LooLooLoo *Sept. 2024*
Hack the North | Sponsor API Prize Winner Waterloo, ON

- Developed an app that senses your phone's Bluetooth signals when you are near a water fountain and sends the user a link to our interactive indoor map with instructions to the nearest bathroom
- Implemented a full-stack solution using **TypeScript** and **React** (with Vite) for front-end and deployed the **Node.js** back-end using **Docker** (with Defang)

Fast-Slow Debugger *Sept. 2022*
Hack the North Waterloo, ON

- A debugging tool to prevent regressions between old and new optimizations by comparing the outputs of two programs run in parallel on inputs from a test set generator
- Implemented a user-friendly front-end with **HTML** and **CSS** with **JS** and **Python** on the back-end

EchoChess *May 2022*
MasseyHacks VIII 3rd place Windsor, ON

- Designed a Discord bot in **Python** to process and digitize handwritten chess scoresheet images from users
- Automated the conversion to a standardized file format that can be imported into all digital chess databases using Amazon Textract, reducing manual input time by over 90%

Volunteer Experience

Vincent Massey Computer Science Club *Sept. 2022 – June 2024*
Junior Stream Teacher | Senior Stream Teacher Windsor, ON

- Created 20+ lesson plans in **Python** and **C++** to teach data structures and algorithms, including binary trees, graph theory algorithms, and dynamic programming, for competitive programming
- Designed and implemented a homework leaderboard using **React**, **Node**, **Firebase**, and a competitive programming website's API to track 50+ members' progress on problems solved

MasseyHacks *Sept. 2022 – June 2024*
Co-Director (2023) | Operations Organizer (2022) Windsor, ON

- Led the Technology team by breaking down projects like the event website and Discord bot into smaller tasks, delegating them to ensure they are completed on time
- Developed a 15-puzzle hackenger hunt focused on testing knowledge of front-end and back-end, implemented in **React** (with Next.js) and **Node** (with Express.js)

Windsor Chess Enrichment Program *Sept. 2021 – Present*
Co-Founder | Full-stack Developer Windsor, ON

- In a team of 4, founded a new local chess club for 50+ chess club members from underserved communities
- Developed a full-stack chess puzzle time-trial using **React**, **Node**, and **Firebase** to increase students' pattern recognition