JACK LONGWELL

41 Oriole Parkway
Toronto, ON, M4V 2E1
647 382 4091
longwelj@mcmaster.ca
https://www.jacklongwell.ca

EDUCATION

Honours Bachelor of Science - Mathematics and Statistics (Fifth Year) 2018 - present
McMaster University, Hamilton, ON Class of 2023

- Minoring in Economics
- 3.7 GPA over past two years
- 2021, 2022: McMaster Deans' Honour List for outstanding achievement in undergraduate studies
- 2018: The McMaster Honour Award, Level 2 for academic achievement in secondary school
- 2018: Ontario Scholar Award for academic achievement in secondary school
- Courses of instruction include: Data Science, Computational Methods of Inference, Stochastic Processes and Bayesian Statistics, Time Series, Mathematical Modeling, Multivariate Analysis

SKILLS

- Programming experience: Python (PyTorch, TensorFlow, OpenCV, SciPy/Scikit-learn, Flask), R (Tidyverse, Torch, Caret, Shiny), MATLAB, SAS, Stata, Visual Basic, SQL, HTML, JS, CSS, Git, Heroku
- Full stack experience creating fully deployable deep learning clinical decision support systems
- Machine learning model and computer vision implementation, webapp creation and deployment, statistical analysis and modeling, theoretical mathematics, information theory, data presentation
- Extensive knowledge of LaTeX, Markdown and all Microsoft Office and Google drive applications

WORK/RESEARCH EXPERIENCE

- **Artificial Intelligence and Statistics Researcher** May 2022 - Present
St. Michael's Hospital, Toronto, ON (Full-Time)
    - Funding: Keenan Research Summer Student ($5,220 bursary)
    - Worked alongside a multidisciplinary team of MDs and postdoctoral fellows to identify clinical stopgaps in ophthalmology that can be streamlined with clinical decision support tools
    - Collected, explored, processed, and analyzed large clinical datasets
    - Conducted statistical analysis on clinical research data and designed insightful graphs, tables and captions. Paper currently in progress
    - Created novel code in consultation with a team of MDs to segment, and quantify the artifacts of a retinal disease. Paper currently in progress
    - Formed relationships with large medical technology companies and integrated new-age software to extract high quality patient images for further study and research

● **Predictive Modelling Collaborator** April 2022 - Present

St. Michael's Hospital, Toronto, ON (Part-Time)

- Conducted systematic literature review alongside an MD to form a list of mal-referred retinal diseases from non-specialists such as optometrists
- Sorted through large hospital databases to form curated, fully encompassing training, testing and validation sets for machine learning purposes
- Trained and implemented a vision transformer deep learning model to predict diagnoses for certain eye diseases using clinical image data
- Using Flask, created a fully functional back and front end, allowing users to submit their own images for evaluation
- Returns disease prediction and class probabilities to HTML front end at an accuracy of 94%
- Hosted on www.ophtho.ai

● **Mathematics Tutor** April 2021 - January 2022

Mathnasium of Forest Hill, Toronto, ON (Part-Time)

- Mentored and tutored dozens of students of various ages across the greater Toronto area
- Maintained a proper professional demeanor during difficult interpersonal situations
- Furthered the Mathnasium brand by engaging with clients and clearly explaining the intricacies of each personalized prescriptive plan
- Lead groups of students both in-center and online while communicating important educational topics, furthering managerial skills and public speaking confidence
- Organized and participated in games and activities to interest young children in mathematical topics, furthering mastery

VOLUNTEER EXPERIENCE

● **Peer Mentor** September 2020 - May 2021

McMaster Women in Mathematics, Hamilton, ON (Volunteer)

- Worked as a mentor to female students in grades 9-12 to help encourage their continued future in advanced fields of mathematics
- Organized meetings between myself and students, looked for and assigned practice problems to help further learning, and taught a self-created curriculum

ADDITIONAL INTERESTS

- Quantum computers
- Photography, films and videography
- Watching, coaching, analyzing and playing sports
- Rubik's Cubes and brain teasers