Jonathan Gong

+1 (778) 957-8081 | jonathangong2005@gmail.com | jonathan-gong | jogong2718

Experience

- **WAT.ai [] []** *September 2024 - May 2025*
  AI Researcher Waterloo, Canada
  - Worked with 20 grads & undergrads to develop healthcare solutions for PWD at **Gluroo Imaginations Inc**.
  - Implemented novel **causal ML models** to predict and interpolate future possible blood glucose trends, improving the time in range of PWD by 60%;
  - Designed a **robust sktime training pipeline** with hyperparameter tuning, dataset selection, train-test splitting, and integration of models (**ClaSPSegmentation, KNN, and HMM variations**). Managed model fitting, prediction, error analysis, and ensured reliability with the **unittest framework**.
  - Implemented the **GMMHMM** model for blood glucose data to improve short-term prandial (during meal-time) and postprandial blood glucose level outcomes for PWD (**MAE of 0.02 , accuracy of 93%**);

- **University of Waterloo CSC [] []** *September 2024 - December 2024*
  Software Developer Waterloo, Canada
  - Designed an organization commenting and rating platform for Waterloo students using **Django, SQLite database, React, and JWT-based authentication**, achieving secure APIs;
  - Implemented a custom search engine with a **TF-IDF algorithm**, reducing query response time by 50% and boosting relevance by 35%;
  - Developed a custom content-based **Deep Q-Network RL model** that acts as a dynamic personalized recommendation system. Implemented using **tensorflow.js** for client-side inference.

Education

- **University of Waterloo** *September 2024 - June 2028*
  Bachelor of Computer Science Waterloo, Canada
  - GPA: 4.00/4.00

Projects

- **Multi-Output Covid-19 Classification and Segmentation Model** *June 2022 - May 2023*
  Tools: Python, Tensorflow, Keras, Scikit-Learn, MatPlotLib, Colab, Jupyter Notebook []
  - Implemented **U-Net** for segmentation (**97.31% accuracy, IOU 0.928**), a novel **autoencoder DenseNet hybrid architecture** for classification (**SOTA 97.65% accuracy, 0.1234 loss**), and a **Grad-CAM** visualization;
  - Used project at 2023 CWSF achieving the senior silver medal; Paper for the project: Paper Link.

- **Monkeypox Diagnostic Web Application** *July 2024 - September 2024*
  Tools: Python, Tensorflow, Keras, HTML, CSS, JS, Tensorflow.js, SQL, PHP []
  - Developed a **CNN+ViT hybrid model** that classifies diseases with skin lesions, achieving a SOTA six-way classification **accuracy of 82.43% and a loss of 0.8234**;
  - Developed a research-oriented web app hosted on **Microsoft Azure** for Mpox and skin lesion diagnosis, integrating user surveys with a **SQL database**. Paper: Paper Link; Website: Website Link.

Publications

J=Journal

[J.1] Jonathan Gong, et al. (2023). **A multi-output network with U-net enhanced class activation map and robust classification performance for medical imaging analysis**. *Discover Artificial Intelligence*, Vol. 03, Article Num 1, DOI: 10.1007/s44163-022-00045-1

- Inspired by my initial model for the CWSF (see projects section), received media coverage: Article Link

Honors and Awards

- **CWSF Senior Silver Medalist** *May 2023*
  Youth Science Canada []
  - Awarded the Senior Silver Excellence Award at the Canada-Wide Science Fair (CWSF), ranking in the top 0.5%, along with $11,500 in scholarships and the $1,000 Senior Youth Can Innovate Award. See paper used in the projects section
- **University of Waterloo Computer Science Club Best Project 2024 (Top 0.2% of Students)** *November 2024 []*
- **AIME Qualifer** *February 2023 []*
- **High School Mathematical Contest In Modeling Finalist (HiMCM top 6%)** *November 2022 []*