

# Avery (Xinran) Gong

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## EDUCATION

**Georgia Institute of Technology**  
*MS, Computer Science*

**Atlanta, GA**  
*Expected May, 2025*

- GPA: 4.00/4.00
- Specialization: Machine Learning
- Coursework: advanced algorithms, deep learning, computer vision, human-computer interaction

**University of Toronto**  
*Honours Bachelor of Science in Physics and Computer Science*

**Toronto, Canada**  
*Sep, 2019 - Jun, 2023*

- GPA: 3.91/4.00, graduated with High Distinction
- Coursework: machine learning, natural language processing, artificial intelligence, algorithms, multivariable calculus, probability and statistics, PDEs, ODEs, complex variables, quantum mechanics

**McMaster University**  
*Honours Bachelor of Health Sciences (BhSc) - transferred out*

**Hamilton, Canada**  
*Sep, 2018 - Aug, 2019*

- GPA: 11.7/12.0 (3.97/4.00)
- Coursework: cellular & molecular biology, behavioural neuroscience, chemistry with lab, inquiry

## SKILLS

**Languages:** Python, Java, C, Go, Javascript, Typescript  
**Tech Stacks:** React Native, Flask, Swift  
**ML Libraries:** PyTorch, TensorFlow, Scikit-Learn, spaCy

**Version Control:** Git  
**Database:** Postgresql, Cloud Firestore, MySQL  
**Data Analysis:** Pyspark, Numpy, Scipy, Matplotlib

## EXPERIENCE

**Software Engineering Internship: F5 Inc, Seattle WA**

*May - Aug, 2024*

- Extended the NGINXaaS for Azure (N4A) software backend data pipelining codebase using **Golang** to send critical business metrics to a data aggregation system, enhancing data accuracy and reporting efficiency.
- Implemented a comprehensive, interactive dashboard using **Python** and **Pyspark** for aggregating and visualizing important business metrics, aiding in data-driven decision making of the N4A team.
- Optimized dashboard rendering by speeding up the query process by 5 times through the creation of an aggregated deployment statistics table, significantly improving performance and efficiency.
- Migrated existing dashboard code to rely on newly optimized table, ensuring seamless integration and improved functionality.
- Created tests in virtual testing environments to ensure functionality and reliability before deployment.

## PROJECTS

**Real-time Facial Emotion Recognition (FER)**

*Jan - Apr, 2024*

- Developed end-to-end facial detection -> facial emotion recognition pipeline using **Tensorflow**
- Implemented, trained, and evaluated a lightweight PAtt-Lite architecture FER model on RAF-DB facial emotion dataset of over 15,000 images
- Performed data augmentation and temporal smoothing to optimize performance of real-time FER

**Chest X-Ray COVID-19 Detection**

*Sept - Dec, 2023*

- Implemented CNN model to detect COVID-19 pathology in Kaggle chest X-Ray dataset
- Performed dimensionality reduction using PCA technique
- Trained, optimized, and evaluated a variety of supervised and unsupervised ML models to perform detection task
- Achieved testing accuracy of 93% on unseen chest X-Ray scans

**Neural Machine Translation on Canadian Hansard**

*Sept - Dec, 2022*

- Implemented encoder-decoder architecture with multi-head attention and beam search update to translate French sentences to English
- Translations achieved BLEU score of 0.8 compared to human-translated text

**Marine Way****Sept - Dec, 2022**

- Designed innovative high-fidelity prototype, receiving highly positive feedback from industry partner Oceanic Impact Inc.
- Developed fully-interactive frontend of cross-platform lost-and-found mobile app using React Native.
- Built and tested key user-end features including item posting, image upload, and geolocation features using google maps APIs.
- Integrate frontend features with backend APIs.

**Rate My Uni****May - Aug, 2022**

- Led team of seven students in building an extended version of RateMyProf in Java.
- Designed backend architecture from scratch following Clean Architecture principles and object oriented design.
- Developed features including efficient filtering and sorting search result based on user-defined criteria.
- Implemented a responsive text-based UI, supporting a variety of features such as user authentication, edit, delete, change language, and up/down-voting existing reviews.

**Hua Rong Dao Solver****Jan, 2023**

- Implemented a search-based solver for the classic Chinese puzzle game Hua Rong Dao that is able to efficiently find optimal solutions for all 32 initial configurations of the board.
- Developed a more advanced version of the original Manhattan Distance heuristic function, which improved the search time by 20%.

**RESEARCH**

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**Sonification Lab, Georgia Tech**  
**Graduate Research Assistant****Atlanta, Georgia**  
**Jan - Apr, 2024**

- Lead a Human-AI Interaction project on investigating preferences of blind and visually impaired (BVI) people on the aesthetic and functional factors of a robot guide dog
- Planned and conducted need-finding processes to gather requirements of robot dog prototype
- Designed multi-modal prototypes and evaluated with BVI participants through focus groups
- Project was awarded Research and Engagement Grant by IPaT at Georgia Tech

**Vutha Lab, University of Toronto**  
**Research Assistant****Toronto, Canada**  
**Aug - Dec, 2021**

- Participated in constructing a novel compact optical clock based on a two-photon transition of calcium atoms.
- Took part in building, calibrating and testing the laser system involved in searching for such transition.
- Monitored, measured, and maintained the magneto-optical trap necessary for observing the two-photon transition.
- Extended legacy Python scripts to better automate the process of data collection and analysis.

**ATLAS Group, University of Toronto**  
**Undergraduate NSERC Research Award Recipient****Toronto, Canada**  
**May - Aug, 2021**

- Extended legacy Python and C++ code to extract and analyze raw data from the VLQ Single All-Hadronic Analysis of ATLAS CERN.

**David Dunlap Institute of Astrophysics, University of Toronto**  
**SURP Fellowship Student Researcher****Toronto, Canada**  
**May - Aug, 2020**

- Developed Python scripts to efficiently clean, extract, and analyze data from the Greenbank Ammonia Survey to characterize the kinematic properties of ammonia gas in star-forming molecular clouds.
- Wrote Python program for transforming abstract, raw astrophysical data into visualizable 2D velocity gradient maps, using Numpy, Seaborn, and Matplotlib.
- Performed 100-step Monte-Carlo analysis to reconstruct the velocity gradient of gases in the Pegasus molecular cloud, and determined a consistent discrepancy between the star formation model and observed data.