Muhammad Umar Ali

umaruali@student.ubc.ca | +1 (778) - 779 - 2078 | linkedin.com/in/muhammad-umar-ali | umarali.ca| github.com/gitUmaru

Education

University of Waterloo — Waterloo, ON
Doctor of Philosophy in System Design Engineering — *Sep 2024 – May 2029*
- **Awards**: 1st Place in IDEAS Clinic Activity Pitch Competition

University of British Columbia — Vancouver, BC
Bachelor of Applied Science in Biomedical Engineering - Concentration in Bioinformatics — *Sep 2019 – May 2024*
- **Awards**: Dean's Honour List, NSERC USRA, Graduated with Distinction

Experience

Stem Cell Bioengineering Laboratory — Vancouver, BC
Deep Learning Research Assistant — *Sep 2023 – Aug 2024*
- Developed cutting edge deep learning model to infer **74%+** of causal gene interaction in T-cell development from scRNA-seq.
- Improving existing platform technology by incorporating neural network architecture to **vastly increase size of virtual gene regulatory networks** beyond current standard of 6 regulators while retaining predictability.

Aspect Biosystems — Vancouver, BC
Software Developer — *Jun 2023 – Aug 2024*
- Led web development effort for bolstering full-stack therapuetic platform contributing to securing **$200 million** investment.
- Spearheaded development of desktop application for microfluidic printhead quality control, increasing production by **11%**.

Software Engineer — *Sep 2022 - Apr 2023*
- Independently developed a minimum viable product for Novo Nordisk partnership negotiations (evaluated at **$2.6 billion**)
- Enhanced STM32 messaging scheme for asynchronous and parallel write operations, reducing run time cost by **68%**.

University of British Columbia — Vancouver, BC
BMEG 310 Undergraduate Teaching Assistant — *Sept 2023 – Dec 2023*
- Led and graded lab sessions for graduate/undergraduate course on introductory machine learning, teaching **100+ students**.

BC Cancer Research Center — Vancouver, BC
Deep Learning Research Assistant — *May 2021 – Aug 2023*
- Trained generative deep learning models in Python with distributed compute clusters resulting in training time of **2 days**.
- Accepted to present at several conferences (Harvard National Collegiate Research Conference 2024, SBME Symposium 2023, BC Cancer Summit 2021) **receiving perfect score** for excellent scientific communication.

Tochtech Technologies Ltd — Surrey, BC
Embedded Systems Developer — *May 2022 – Aug 2022*
- Achieved machine learning model inference time of less than **200ms** on ESP32 with low-resource hardware by streamlining C++ digital signal processing steps, thereby reducing runtime cost and improving responsiveness.
- Thoroughly tested and validated production code on IoT devices using PlatformIO unit tests for **90%+** code coverage.

Artificial Intelligence in Medicine Laboratory — Vancouver, BC
Machine Learning Research Assistant — *May 2020 – July 2020*
- Designed, developed and implemented cross-platform machine learning model using ONNX and TFLite with accuracy of **90%**
- Fine-tuned ResNet50 network for coarse classification on ovarian carcinoma histotypes for **improved slide scanning**.

Extracurricular

Graduate Student Endowment Fund — Waterloo, ON
Board of Director — *Nov 2024 – Present*
- Help manage funding pool of **$170K** by reviewing and approving project recommendationsm; projects include 3 minute thesis, GradFLIX, academic conferences, and community initiatives.

Projects

Full-Field Optical Coherence Tomography Dynamic Microscope | *MATLAB, Altium CAD, Solidworks* — Sep 2023 - Apr 2024
- Designed a microscope with **1um spatial resolution and 25Hz temporal resolution**, which was extensively documented with design history files as per FDA medical device standards, for engineering capstone project.

Transport Phenomena in Biological Systems Notes | tinyurl.com/transport-phenomena — Sept - Dec, 2021
- Co-authored a set of class notes to elucidate mathematical models of transport in a cellular context, currently being used as the ***de facto*** **textbook for BMEG 371 at UBC**.