MUHAMMED ARFATH KHAN

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EDUCATION

Carleton University | Master of Computer Science (Co-op) Sep 2023 - Aug 2026

Carleton University | B.Sc. (Honours), Computer Science Sep 2018 - Apr 2023

Minor in Business | Graduated with Distinction | GPA: 10.38/12

EXPERIENCE

Carleton University | Teaching Assistant Jan 2022 - Apr 2026

- Explained C++ concepts to approximately 40 students weekly through labs and office hours.
- Graded 30 assignments weekly and provided feedback on programming and debugging.

Ciena | Product Verification Intern Sep 2024 - Aug 2025

- Executed 50+ system-level test cases using Python, Postman, and REST APIs in a telecom lab, validating optical networking platform functionality, performance, and reliability against design specifications.
- Automated Python test procedures, improving test coverage and reducing manual effort by 30-40%.
- Analyzed test failures with Python scripts, documented defects, and collaborated with engineering teams to identify and resolve root causes.

Ford Canada | Automation Tester May 2022 - Aug 2022

- Developed and maintained Python automation scripts, increasing script output fivefold.
- Automated all manual test scripts for one service, cutting testing time by 50% and improving coverage by 75%.
- Collaborated with cross-functional teams to define testing requirements and reported test results using TestRail.

Ericsson Canada | Analytics Software Developer Sep 2020 - Apr 2021

- Optimized R Shiny application code and database queries, increasing concurrent user capacity by 50%.
- Developed Python and Clojure scripts and submitted tested, documented pull requests.
- Optimized data-processing algorithms, reducing processing times by 40%.

TECHNICAL SKILLS

Languages: Python, C/C++, SQL, JavaScript, TypeScript, Java, R, Clojure
Frameworks & Databases: PostgreSQL, Node.js, Express, React, R Shiny, Qt
Software Engineering: Client-server systems, REST APIs, multithreading, object-oriented design, UML
Testing: JUnit, GoogleTest, CTest, Postman, TestRail, Selenium, Cypress
Developer Tools: Git, GitHub Actions (CI), Docker, Kubernetes, Linux
AI-assisted Coding & Debugging: ChatGPT, Antigravity

SELECTED PROJECTS

Cell Tower Simulation | Concurrent Client-Server Systems Jul 2026

github.com/DesaultierMAKK/CellTowerSimulation

- Designed and built a C++20 client-server simulation using POSIX TCP sockets, multithreading, and length-prefixed JSON messaging to coordinate independent vehicles and tower servers.
- Designed an SFML visualizer for 100 moving clients and seven tower-server threads, showing coverage, capacity, and connections.
- Implemented session continuity across tower handovers, deterministic mobility and signal models, capacity reservations, tower outage recovery, and coordinated 20-second shutdown.
- Developed unit, integration, and end-to-end tests with GoogleTest and CTest to verify system behaviour.
- Validated concurrent network behaviour using Docker, GitHub Actions, sanitizers, and clang-tidy.

Darknet Traffic Classification | Machine Learning Nov 2025

- Collaborated with one teammate to build a CICDarknet2020 pipeline classifying benign and darknet traffic.
- Processed network flow data, handled missing values, encoded and normalized 26 selected features, and balanced classes with SMOTE.
- Evaluated Random Forest, XGBoost, neural network, and ensemble models using 5-fold cross-validation, achieving 0.98 precision, recall, and F1-score with a neural network and Random Forest ensemble.

Alpha Stim Device Simulation | Object-Oriented Design, C++ Sep 2021 - Dec 2021

- Built and tested a Qt/C++ simulation of CES device embedded software on Linux in a four-person team.
- Created use-case and object-oriented design models with UML class, sequence, and state diagrams.
- Implemented the observer pattern between the user and time manager to notify users of remaining therapy time.
- Documented functional and non-functional requirements and mapped use cases to test cases in a traceability matrix.