

Taisir Hassan

☎ 647-667-3006 | ✉ taisir.hassan@uwaterloo.ca | in [linkedin.com/in/taisir-hassan](https://www.linkedin.com/in/taisir-hassan) | 🐙 github.com/taisirhassan | 🌐 taisirhassan.netlify.app

EDUCATION

University of Waterloo

Waterloo, ON

Candidate for BAsc in Honours Computer Engineering, Minor in Comb & Optimization

Expected Graduation: May 2028

- **Cumulative GPA: 3.7**
- **Relevant Courses:** Data Structures & Algorithms (C++), Digital Circuits & Systems (VHDL), Electronic Circuits, Linear Algebra, Digital Computers (RISC-V ASM), Numerical Methods (MATLAB)
- **Undergraduate Research Assistant:** Digital Circuit State Verification via De Bruijn Sequences & CAN Bus Logic

EXPERIENCE

Onboard Payload Embedded Software Engineering Co-op

Jan 2025 – Apr 2025

Telesat

Ottawa, ON

- Developed containerization architecture for satellite simulator, initially creating **Ubuntu 22.04** development and runtime environments, then successfully overseeing migration to **Ubuntu 24.04** while maintaining compatibility across **Versal FPGA** and **SX4000** hardware platforms
- Created **Debian packages** and upgraded CI/CD pipelines organization-wide with templated Ubuntu 24.04 containers, implementing **Ansible** automation and **WSL bzImage** customization scripts, improving environment consistency by **40%**
- Led integration efforts for simulated satellite components including **Ciena routers** and modem banks, implementing **SR-MPLS** networking with **VPP** data plane to enable proper traffic routing with segment routing between payload systems and ground segments
- Automated network management testing by developing scripts for **gNMI** client installation and **gRPC** execution against the simulator, reducing configuration time by **35%** and enabling consistent verification of satellite control system functionality

Electrical Team Member

May 2024 – Present

UW Rocketry

Waterloo, ON

- Developed and optimized **PWM** and **ADC drivers** with low-pass filter logic for the **PIC18F26K83** in **C**, reducing signal noise by approximately **15%** as measured with oscilloscopes and wave generators
- Implemented **RTOS-compatible I2C**, **UART**, and **IMU handler** for **STM32 HAL** in **C/C++**, while also creating a comprehensive unit test framework with **GTest** and **FFF** for embedded driver validation
- Engineered **APB bridge interface** and **SPI controller** in **SystemVerilog** for the **SRAD GNSS receiver** FPGA project, creating testbenches and CSR verification to ensure core satellite positioning functionality and reliable signal processing
- Led schematic design for **USB debug board PCB** featuring **12V boost converter** and **CAN-USB** communication with **Harwin** connectors

Data Quality Specialist

May 2023 – Sept 2023, May 2024 - Aug 2024

Cohere.ai

Toronto, ON

- Collaborated in the quality assurance of a state-of-the-art Large Language Model.
- Achieved an average task completion rate of **98%**, ensuring timely and accurate completion of text and code-based tasks.
- Decreased data discrepancies and inconsistencies by **25%** through meticulous data quality control measures

Junior Fullstack Developer

Jan 2022 – Apr 2022

Playfair Technologies

Toronto, ON

- Spearheaded the launch of a **React Native** mobile application, leading to a remarkable **50%** increase in user engagement. This initiative involved a strategic transition from existing Swift (iOS) and Flutter (Android) applications. ensuring timely and accurate completion of text-based tasks
- Significantly improved application performance and response time by **30%**, achieved through meticulous optimization of back-end functionalities utilizing **Scala**.
- Enhanced the application's deployment process by integrating **Docker** containers, leading to a **40%** reduction in deployment time.

PROJECTS

🔗 Virtual SmartHome Dashboard | *Python, Next.js, AWS (IoT Core, EKS, S3, Terraform), MQTT, PostgreSQL, Redis, Docker*

- Utilized **Python** to simulate IoT devices for a Smart Home Dashboard, leveraging **AWS IoT Core** and **MQTT** for device communication, orchestrated using **Docker** and **EKS** for containerization, automated with **Terraform** for resource provisioning on AWS, including **Lambda@Edge** for content optimization.
- Built a **React** dashboard with **Next.js** for visualizing analytics from devices, hosted on **S3** with CloudFront distribution for enhanced global reach, automated deployment through **GitHub Actions**, and integrated with **AWS X-Ray** for in-depth monitoring and performance analysis.
- Engineered a **Go** backend for robust data handling and retrieval from a **PostgreSQL** database, utilizing **Redis** for fast data caching

🔗 RPM (Remote Process Monitor) - cuHacking 6 Winner | *QNX, C++, WebSockets, React*

- Won **Best Use of QNX** award at cuHacking 6 for developing a process monitor that interfaces with **kernel-level APIs** to track resource utilization and detect system anomalies in real-time
- Built **C++ backend** to extract data from **QNX kernel structures** with **WebSockets** for real-time transmission
- Created **React dashboard** for visualizing and controlling system processes without terminal access

🔗 AudioViz | *C++, OpenGL*

- Developed **AudioViz**, a real-time audio visualizer in **C++** and **OpenGL** with multiple visualization styles including bar graph, circular, and waveform in both **2D** and **3D** modes
- Utilized **Fast Fourier Transform (FFT)** with **PortAudio** for real-time frequency analysis from mic input and audio files.
- Enhanced visual quality with **post-processing effects** including bloom, while maintaining interactive performance through modular architecture and **Dear ImGui** interface for customizing visualization parameters

🔗 CipherStream | *Rust, libp2p, Cryptography*

- Engineered **P2P file transfer** in **Rust** using **libp2p** with **mDNS discovery**, eliminating need for central servers
- Created fault-tolerant architecture with **dynamic port allocation** and **connection backoff** for reliable concurrent transfers

TECHNICAL SKILLS

Languages: C/C++, Java, Python, C#, Go, VHDL, SystemVerilog/Verilog, Rust, MATLAB, SQL, JavaScript/Typescript, HTML/CSS, Ruby

Frameworks/ Libraries: FreeRTOS, pandas, NumPy, Matplotlib, OpenCV, ROS, React, PyTorch, TensorFlow, React Native, Node.js, Express.js, Flask, Ruby On Rails

Protocols: AMBA APB, HTTP/HTTPS, TCP/IP, MQTT, SSL/TLS, UDP, I2C, SPI, UART, CAN, DNS

Developer Tools: Git, Ansible, CMake, Bash, Linux, Docker, Kubernetes, Simulink, GDB, GCC, GCP, VSCode, Visual Studio, Eclipse, Postman, MongoDB, Agile, Confluence, Github, Gitlab, AWS (S3, Cloudfront, Terraform, X-Ray), Redis