

Maaz Ahmad

AI/ML Software Engineer – MSc Mechatronics (University of Waterloo)

Portfolio | [GitHub](#) | [LinkedIn](#) | +1 437 870 8791 | m23quires@uwaterloo.ca | Waterloo, Canada

EXPERIENCE

AI & Robotics Software Engineer

Cobionix Corporation

Sept. 2025 – Present

Kitchener, Canada

- AI algorithm development for computer vision pipeline on NVIDIA Jetson Orin (ONNX) for real-time perception.
- Optimizing TensorRT models with quantization and GPU/APU profiling to hit strict edge power-latency targets.
- Implementing firmware-style loops that monitor GPU/CPU load and adapt AI inference rates on-device.

Research Assistant: Software Engineering

Apple

January. 2024 – July 2025

Waterloo, Canada

- Confidential project (NDA). Optimized SDR WiFi/OTA data paths in C++/Python on embedded Linux, cutting end-to-end latency.
- Profiled CPU, memory, and I/O to pinpoint bottlenecks and guide low-level code optimizations.
- Used Python/ML analysis on RF and telemetry logs to tune link parameters for stable throughput.
- Collaborated with RF, firmware, and embedded software teams to validate wireless performance over-the-air.

Autonomy Software Graduate Research Student [Preprint: [Link](#), Video: [Link](#), Git: [Link](#)] January. 2024 – September 2025

UW ROBOHUB

Waterloo, Canada

- Developed multi robot SLAM algorithm with 85% improvement vs baseline SOTA in C++/ROS2 on embedded Linux.
- Sensor fusion mmWave 4D radar with RGB-D in low-latency pipelines for perception and achieved 92% accuracy.
- Implemented TSDF-octree mapping in Docker on edge GPUs, tuning CPU/GPU load for real-time updates.
- Trained and deployed ML-NeRF and YOLO model on constrained GPUs, optimizing dataflow for real-time AI.
- Developed Python tooling to log SLAM accuracy/latency and used ML analysis to tune algorithms.

Research Assistant: ML Software Engineering [Preprint: [Link](#), Git: [Link](#), Video: [Link](#)] September. 2024 – December 2024

KEYSIGHT TECHNOLOGIES

Waterloo, Canada

- Developed software pipeline with OMPL library for 7-DoF COBOT - ML model for Motion planning algorithm.
- Deployed ML-augmented RRT planners via Python APIs with CI-friendly benchmarking across custom scenarios.
- Achieved 100% joint/collision avoidance constraints using auto-generated config launch trees.
- Validated deployment across sim-to-real environments with versioned motion plans and hardware-in-the-loop.

Software Engineer | MITACS Research Internship

ROGERS Communications Canada Inc

January. 2024 – August 2025

Waterloo, Canada

- Integrated 5G with AI-SLAM on embedded Linux (Nvidia Jetson), used C++ stacks for latency and telemetry.
- Achieved 37% improvements, applied Python/ML models predict congestion and tune network parameters.
- Achieved real-time edge compute over 5G 28GHz channel and optimized the ML model using TensorRT.
- Containerized ROS2 services in Docker and added metrics hooks to drive data-informed optimization of pipelines.

Asset Integrity Engineer II: Software

ABYSS Solutions Inc

May 2022 – December 2023

Ish (Onsite) & Australia

- Developed C++/Tensor flow CV pipelines for sonar and camera data to detect structural defects offshore rigs.
- Optimized batch inference and preprocessing to run large inspection jobs within tight memory and time budgets.
- Fused multi-sensor ROV/AUV data streams to improve anomaly detection robustness in low-visibility conditions.
- Led a 10-engineer team processing 18,000+ assets for BP Clair Ridge, achieving 91% high-quality digital inspection.

Graduate Instrumentation and PLC Engineer

Fauji Cement Industry Co Ltd

Sept 2021 – March 2022

Wah Cantt (Onsite), Pak

- Familiarized with Siemens and ABB PLC industrial automation controls procedures. While working on plant rotation plan, observed troubleshooting, & calibrations of sensors i.e RTDs-Pyrometer, and load cells

EDUCATION

University of Waterloo Thesis: AI/ML Autonomy Link 1 & Motion Planning Link 2	Waterloo, Canada
Masters of Applied Science (MSc), Mechatronics Engineering (CGPA: 93.5%)	Jan. 2024 – Aug. 2025
Courses: AI/ML Computational Intelligence Autonomous Mobile Robots Social Robotics nanoBIOTECH	
Advisor(s): Dr. William Melek ; Dr. George Shaker	
Bahria University Thesis: AMRs AI/Swarm Robotics Autonomy Link	Islb, PK
Bachelor of Science (BSc), Electrical Engineering and Computer Science (CGPA: A+)	Sept. 2017 – Aug. 2021

SKILLS

Languages: C | C++ | Python | Bash | Object-Oriented Programming | Data Structures & Algorithms | Operating System (OS)

Embedded: API Embedded Linux (Jetson Orin, Ubuntu) | Low-latency edge compute | Real-time data pipelines | HW/SW integration | Microcontroller/SOC bring-up (sensors, cameras, networks) | Bare-metal/firmware C on MCUs | Power/performance tuning

AI/ML & Optimization: TensorRT (CUDA) | PyTorch | TensorFlow | Scikit-learn | Model deployment on edge devices | Latency & throughput optimization | Quantization & pruning (edge AI) | Classical ML (KNN, SVM)

Control, Sensing & Autonomy: Visual-Inertial SLAM | Sensor fusion (RGB-D, IMU, mmWave Radar) | Motion Planning (OMPL) | MPC | Multi-robot coordination

Tools & Build Systems: Linux | Git | Docker | CMake | CI/CD (GitHub, GitLab) | ROS2 | Jupyter | Matplotlib

SIDE PROJECTS

Humanoid Robotics: Non-Verbal Gesture | Project Report: [Link](#)

- Integrated LLaMA 3 with gesture and vision sensing for real-time multimodal control of NAO robot, enabling non-verbal HRI via IMU-based motion interpretation

Visual Feature Extraction using Machine Learning Models

- Applied regression models (KNN, SVM) on complex image datasets to improve automated visual feature extraction, enhancing perception algorithms and robustness—key for camera data processing in autonomous systems.

AMRs in Health Care | Project Video: [Link](#)

- Designed an RFID-based autonomous nursing robot for pill dispensing and path-following in healthcare environments. Enabled simultaneous delivery of six types of medication and live video streaming.

ACHIEVEMENTS

- Best Performer Employee of the Month, Abyss Solutions Inc.
- Winner of 3 Hackathons on robotics and VR innovation at Abyss Solutions.
- Awarded full MSc Graduate funding award and recognized among top 3 undergraduate thesis projects.

PUBLICATIONS

M. Qureshi et al., "CRADMap: Applied Distributed Volumetric Mapping with 5G-Connected Multi-Robots and 4D Radar Perception," *ICARM 2025*. [\[arXiv\]](#)

M. Qureshi et al., "RAPTAR: Radar Radiation Pattern Acquisition through Automated Collaborative Robotics," *RA-L 2025 Robotics and Automation Letters Journal*. [\[arXiv\]](#)

ACADEMIC EXPERIENCE

ICARM 2025 Conference Presentation	Portsmouth, United Kingdom
Conference Publication Presentation	2nd August, 2025
RoboHub Symposium Presentation	Waterloo, Canada
Presenter at RoboHub Symposium Research Presentation and Poster booth holder	17th Jan, 2025
Beyond Connectivity Summit Conference	Brampton, Canada
Presenter at Rogers Technology Conference for Research work	July, 2024
University of Waterloo	Waterloo, Canada
Teaching Assistant, MTE-203 Advanced Calculus – ME-360 Automatic Control Systems	May 2024 – Present