# Zainalabdeen Al-Saffi

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## Education

**The University of Queensland** St Lucia QLD

*Bachelor of Economics / Computer Science (Quant and Machine Learning Major)* *Feb. 2024 – October 2027*

- **GPA:** 6.75/7.00 (Deans Academic Excellence Award 2025)
- Treasurer - UQ Computing Society
- General Executive - UQ Fintech

## Experience

**Thiess** South Bank QLD

***Data Science Intern*** *Dec. 2024 – Feb.2025*

- Developed a statistical learning state machine using Gaussian Mixture Models and IMM-EKF for real-time truck operation classification and sensor fusion, enhancing reliability and reducing costs by 20% .
- Conducted extensive data cleaning and feature engineering using PySpark, SQL, and Jupyter Notebooks, including joining disparate telemetry datasets and modelling sensor noise. .
- Developed a linear model to correct timestamp misalignment, ensuring synchronisation across data sources. Optimised GMM performance via BIC, AIC, Elbow Method, Calinski-Harabasz Index, and the EM algorithm
- Integrated a domain-specific penalty matrix with the Viterbi algorithm to constrain improbable state transitions, improving classification accuracy and operational efficiency.

**UQ Racing** St Lucia QLD

***Lead Software Engineer*** *Nov. 2024 – June 2025*

- Led ROS-to-ROS2 migration in Python and C++, integrating TensorRT-quantised YOLOv11 for faster, more accurate cone detection in real-time autonomous navigation.
- Built a Dockerised ROS2-Gazebo simulation environment enabling remote development and virtual testing, boosting testing availability by 80% and accelerating R&D deployment.
- Researched and experimented with advanced sensor fusion techniques (EKF, UKF) and FAST-LIO SLAM to produce high-fidelity simulation maps of test tracks.
- Introduced a task-ranked project management system with strategic resource planning and regular stand-ups, eliminating missed deadlines and making the software team the project's top performer.

***Software Engineer*** *Feb. 2024 – Nov. 2024*

- Developed path planning algorithms using a perception stack integrating YOLOv8, Lidar, and INS data with Delaunay Triangulation for track driving.

**University of Queensland** St Lucia QLD

***Casual Academic Tutor*** *June. 2025 – Present*

- **COMP3710 (Pattern Recognition and Analysis):** Instructed 20+ students weekly on machine and deep learning models and techniques

St Lucia QLD

***Student Services Ambassador*** *Jan. 2025 – Present*

- Assisted students with selection of courses and navigating UQ's proprietary software for enrollments, while representing the university as one of 30 ambassadors

St Lucia QLD

***Future Students Ambassador*** *Mar. 2025 – Present*

- Represented the university and EAIT faculty in school expos, talks and careers fairs to guide prospective students in degree selection

## Projects And Competition Awards

**IMC Prosperity 3** | *Python, Git, Jupyter, Sk-Learn* April 2025

- Applied advanced statistical techniques in a 5-person team during IMC Trading's global competition, including cointegration and Ornstein-Uhlenbeck modeling for mean-reversion, Black-Scholes-based option pricing, IV curve fitting, and delta-hedging to build robust pairs, basket, and options arbitrage strategies. Developed a custom Python visualiser to automate stationarity checks and monitor real-time PnL, contributing to a **1st place QLD finish, 9th AU, 60th algorithmic globally out of 15,000 teams)**.

**ValoStats** | *Python, Streamlit, Jupyter* August 2024

- **Led a team of 6 engineers to develop ValoStats**, a full-stack web application using Python and Streamlit that integrates RIOT's API for real-time match data; Kaggle dataset was pulled and featured engineered while implemented Gradient Boosting and Logistic Regression ensemble methods to accurately predict match outcomes with 90% accuracy, earning the **People's Choice Award at the UQ Computing Society Hackathon.**

**AlgoJam** | *Python, Git* September 2024

- **Coordinated a team of 3 to analyze and strategize financial instruments** for the UQ Fintech Algothon by developing ARIMA time-series models and pair trading strategies, applying exponential moving averages to optimize asset performance, and securing **third place** in the competition sponsored by IMC Trading

**SkinDetect** | *Python, Git, Pytorch* September 2024

- **Designed and implemented a Siamese network with ResNet50 and triplet loss in PyTorch** to classify benign and malignant skin lesions for the ISIC 2020 Challenge, achieving 95% accuracy; addressed class imbalance through oversampling and balanced batch sampling, utilized CUDA 11.8 for optimized training, and conducted comprehensive evaluations using AUC-ROC and t-SNE visualizations to ensure reliable performance

## Technical Skills

**Languages**: Java, Python, C/C++, JavaScript, TypeScript
**Frameworks / SDKs**: Streamlit, Node.js, JUnit, ROS, gtest, CUDA, TensorRT
**Developer Tools**: Git, Docker, VS Code, Visual Studio, PyCharm, IntelliJ, Azure databricks, Jupyter Notebooks
**Libraries**: pandas, NumPy, Matplotlib, pytorch, scitkit-learn, eigen, seaborn, streamlit, pyMLE, statistics