MADI (MADELINE) ABIO

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EDUCATION

Bachelor of Electrical Engineering (Honours) / Bachelor of Computer Science
2022 – 2026 | Griffith University | Gold Coast, QLD | GPA 6.32

International Trimester Exchange
2024 | University of Utah| Salt Lake City, Utah, USA

AWARDS & SCHOLARSHIPS

o **Academic Excellence |** *Griffith University, 2025*
o **Academic Excellence |** *Griffith University, 2024*
o **Academic Excellence |** *Griffith University, 2023*
o **Chancellor's Scholarship |** *Griffith University, 2025*
o **Amplify Connector |** *Energy Queensland, 2025 – Present*
o **Future of Energy Scholarship |** *Energy Queensland, 2023 – 2025*
o **Students in Power Bursary |** *Australian Institute of Power, 2022 – 2023*
o **Brighter Futures Scholarship |** *The Abedian Foundation, 2022*

WORK EXPERIENCE

VPTech – Software Engineer   *Aug 2025 – Present | Gold Coast, QLD*

o Developing production-grade agentic Retrieval-Augmented Generation (RAG) systems with human-in-the-loop feedback and validation, including Vector Database integration, MCP tool development and interaction/interface design (AWS AgentCore, LangGraph, LangChain).
o Designed and implemented core full-stack features using React and NestJS, contributing to frontend structural conventions and tooling decisions.
o Contributing to system design, CI/CD pipelines and full-stack development.

Energy Queensland – Grid Technology Intern   *Jan 2025 – Sept 2025 | Brisbane, QLD*

o Developed an anomaly detection machine learning model to detect neutral faults targeting deployment across 10,000 smart meters (see: Neutral Fault Detection project).
o Streamlined daily operational data analysis by building a solar panel data dashboard in Python/Power BI, reducing manual processing time from 15 minutes to 15 seconds.
o Managed project delivery using hybrid Agile/Waterfall principles, including facilitating weekly sprints.
o Automated various non-technical workflows.
o Coordinated two internal networking events for interns and graduates.

Griffith University – Undergraduate Research Assistant   *Mar 2024 – Jun 2024 | Gold Coast, QLD*

o Performed data pre-processing for a machine learning research project by cleaning and structuring large datasets using Pandas (Python), Bash and the HDF5 format.

Energy Queensland – Cyber Security Platforms Intern   *Nov 2023 – Feb 2024 | Brisbane, QLD*

o Developed a strong foundation in computer networking through self-directed training and mentorship, covering the OSI model, network protocols, and enterprise network architecture.
o Resolved ServiceNow tickets by applying network and security protocol knowledge.
o Gained exposure to enterprise cybersecurity practices, including cloud security, firewall management (Panorama), and Netskope.

PROJECTS

Digital Bass Synthesizer on Microcontroller   *Embedded C, Sept 2025 – Oct 2025*

- o Designed a digital bass synthesizer running at a 48 kHz sample rate on the TM4C1294NCPDT microcontroller.
- o Developed firmware in bare-metal embedded C to generate waveforms, control ADSR envelopes, and handle user input from potentiometers (via analog-to-digital converters) and matrix keypad.
- o Engineered a custom external clock circuit to bridge the I^2C peripheral for compatibility with the I^2S DAC.
- o Configured SPI peripheral to drive the 240x320 LCD for waveform and real-time ADSR value visualization.
- o Implemented DMA ping-pong buffers for continuous audio streaming and optimized ISR timing for stable waveform output.

Neutral Fault Detection (Anomaly Detection)   *Python, Feb 2025 – Sept 2025*

- o Developed an in-house neutral fault detection algorithm based on an internal research paper to investigate excessive false positives produced by a third-party solution that also lacked coverage across all smart meters.
- o During implementation and side-by-side evaluation, identified systematic false positives in the third-party system on solar PV sites, caused by violated voltage–current modelling assumptions that made normal solar behaviour resemble neutral fault signatures.
- o Proposed a revised approach that explicitly accounted for solar PV electrical behaviour.
- o Designed and prototyped a scalable architecture targeting deployment across 10,000+ smart meters.
- o Built a parallelized feature extraction and model evaluation pipeline, and applied time-ordered, meter-isolated validation with systematic error and failure-mode analysis.

Encryption Client   *C++, May 2025*

- o Developed a terminal-based multi-round message encryption/decryption client, applying OOP principles with abstract base classes, inheritance, and polymorphism for modular, reusable design.
- o Implemented a finite-state machine menu interface with input validation and exception handling, leveraging STL and lambda functions for efficient message processing.

Stopwatch on DE10-Lite FPGA   *Verilog, Nov 2024*

- o Designed a stopwatch with reset, start/resume, and stop/pause.
- o Applied modular design principles by separating the stopwatch into 3 modules: finite state machine, clock divider and display.
- o Verified functionality and performance using waveform analysis and testbenches.

CLUBS & SOCIETIES

- o **Ravi's Study Program |** *Mentee, 2026*
- o **Griffith University Coding Club (GCC) |** *ICPC Div B Competitor & Member, 2025 – Present*
- o **UQ Computing Society Competitive Programming Group (UQCS CPG) |** *Member, 2025 – Present*
- o **UQ Fintech Society |** *Member, 2025 – Present*
- o **Griffith University Advanced Robotics Development (GUARD) |** *Member, 2023 – Present*
- o **Griffith University Gold Coast IEEE Student Branch |** *Administrator, 2023*

SKILLS

- o **Programming Languages:** Python, TypeScript, C, C++, C#, Bash, Batch
- o **Software Development & Tools:** Git, AWS, Unix, Linux, CLI, React, Next.js, NestJS, Prisma, PostgreSQL, CI/CD, .NET
- o **Machine Learning & Data Science:** Applied ML, LLM orchestration, Data Science, DSA, AWS AgentCore, Pandas, NumPy, scikit-learn, h5py
- o **Embedded & FPGA:** SystemVerilog, RTL Coding, Testbenching, Embedded/Bare Metal C
- o **Software Practices:** Object-Oriented Programming, Test-Driven Development
- o **Professional Skills:** Technical Writing, Problem Solving, Teamwork, Communication