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

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

WORK EXPERIENCE

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

- Developing production-grade Retrieval-Augmented Generation (RAG) pipelines with human-in-the-loop feedback and validation, including managing Vector Database integration and optimising for answer accuracy.
- Engineering AI agents and LLM tooling using orchestration frameworks (LangGraph, LangChain).
- Proactively identified unsustainable technical debt early in the development cycle, pre-empting a future, significantly more costly and time-intensive redesign.
- Contributing to system design, microservice architecture and full-stack development.

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

- Developed an anomaly detection machine learning model to detect neutral faults targeting deployment across 10,000 smart meters (Neutral Fault Detection project).
- 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.
- Managed project delivery using hybrid Agile/Waterfall principles, including facilitating weekly sprints.
- Automated various non-technical workflows.
- Coordinated two internal networking events for interns and graduates.

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

- 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*

- Resolved ServiceNow tickets by applying network and security protocol knowledge.
- Gained exposure to enterprise cybersecurity practices, including cloud security, firewall management (Panorama), and Netskope.
- Advanced technical skills through self-guided training, including completing Google IT Security and Computer Networking courses.

PROJECTS

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

- Designed a digital bass synthesizer running at a 48 kHz sample rate on the TM4C1294NCPDT microcontroller.
- 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.
- Engineered a custom external clock circuit to bridge the I^2C peripheral for compatibility with the I^2S DAC.
- Configured SPI peripheral to drive the 240x320 LCD for waveform and real-time ADSR value visualization.
- 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*

- 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.
- 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.
- Proposed a revised approach that explicitly accounted for solar PV electrical.
- Designed and prototyped a scalable architecture targeting deployment across 10,000+ smart meters.
- 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*

- Developed a terminal-based multi-round message encryption/decryption client, applying OOP principles with abstract base classes, inheritance, and polymorphism for modular, reusable design.
- Implemented a finite-state machine menu interface with input validation and exception handling, leveraging STL and lambda functions for efficient message processing.
- Built unit tests with Google Test to validate algorithm correctness and class functionality.

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

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

CLUBS & SOCIETIES

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

SKILLS

- **Programming Languages:** Python, C, C++, C#, Bash, Batch, Typescript
- **Embedded & FPGA:** SystemVerilog, RTL Coding, Testbenching, Embedded/Bare Metal C
- **Software Development & Tools:** Git, AWS, .NET, Unix/CLI
- **Machine Learning & Data Science:** Applied ML, LLM orchestration, Data Science, DSA
- **Software Practices:** Object-Oriented Programming, Test-Driven Development
- **Professional Skills:** Technical Writing, Problem Solving, Teamwork, Communication