

# NATHAN ROMEO

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Portfolio: [nathanromeo.com](https://nathanromeo.com)

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## PROFESSIONAL SUMMARY

Graduate software and AI engineering student specialising in full-stack AI systems, backend development and machine learning integration. Experienced building and deploying production-style applications using FastAPI, React, PostgreSQL, Docker, and LLM pipelines. Strong background in AI automation, speech-to-text workflows, structured data extraction and scalable API design, combined with ten years of commercial project delivery and stakeholder communication experience.

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## TECHNICAL SKILLS

### Programming Languages:

Python, JavaScript, TypeScript, SQL, R, C++, HTML/CSS

### Machine Learning & AI:

scikit-learn, Ollama, Whisper, prompt engineering, supervised & unsupervised learning, feature engineering, model evaluation

### Frameworks & Tools:

FastAPI, React, Docker, SQLAlchemy, Pydantic, Git

### Databases:

PostgreSQL, MongoDB, MySQL, relational schema design

### DevOps & Deployment:

Docker, container networking, API deployment, environment configuration

### Other Tools:

Microsoft Excel, Microsoft Office Suite, Adobe CC Suite, WordPress

# EDUCATION

## Bachelor of Information Technology

*Majors: AI & Data Analytics • Software Development*

University of Southern Queensland | 2023 – Present | GPA: 6.94/7

- Developed RESTful backend APIs using FastAPI with structured request validation and schema enforcement.
- Designed relational database schemas and ORM models using PostgreSQL and SQLAlchemy to support scalable backend services.
- Built and evaluated machine learning models in Python using scikit-learn for predictive analytics and clustering tasks.
- Improved model performance through feature selection, validation tuning, and statistical evaluation techniques.
- Built and deployed Docker-based applications to improve portability and environment consistency.
- Completed industry-facing capstone project developing an AI-assisted conversational documentation system integrating speech-to-text, multilingual processing, LLM-based extraction and structured database persistence.

## International University Program: Digital Transformation & Intercultural Communication

Darmstadt University of Applied Sciences, Germany | 2025

- Analysed digital transformation strategies and AI governance implications.
  - Evaluated regulatory compliance considerations for emerging technologies.
  - Collaborated in multicultural teams to assess technology adoption challenges.
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# PROJECT EXPERIENCE

## CareShield AI: Full Stack AI Documentation System

Technologies: Python, FastAPI, PostgreSQL, React, Docker, Whisper, Ollama

- Designed a modular AI processing pipeline separating translation, conversational logic, and structured extraction services.
- Integrated speech-to-text processing using Whisper.
- Integrated multilingual language detection and contextual translation workflows to support diverse user inputs.
- Implemented strict JSON schema validation to improve reliability and consistency of structured LLM outputs.
- Designed PostgreSQL schema supporting session-based conversational persistence.
- Containerised backend services with Docker to streamline deployment and environment consistency.

## Nathan AI: Full Stack Portfolio Chat Assistant

Technologies: Python, FastAPI, React, Vite, Docker, Groq API, Render, Vercel, httpx

- Developed a FastAPI backend service integrating external LLM APIs through Groq for real-time conversational responses.
- Grounded replies with version-controlled persona/knowledge Markdown bundled into the backend image.
- Configured CORS for multiple production origins (Vercel, custom domain WordPress embed).
- Containerised and deployed backend services using Docker and Render to support scalable cloud hosting.
- Responsive React + Vite UI with streaming-style loading states, fetch-based integration and Git-backed continuous deployment on Vercel.
- Integrated the AI assistant into a live production WordPress environment.

## **Depth of Anaesthesia Index: Hybrid Machine Learning Model**

Technologies: Python, scikit-learn

- Implemented linear SVM for continuous prediction aligned with BIS reference values.
- Used K-means clustering to identify patterns across anaesthetic state data.
- Developed a hybrid machine learning model combining supervised and unsupervised approaches to improve prediction accuracy.
- Optimised model hyperparameters using validation datasets to reduce prediction error.
- Achieved correlation (r) of 0.905 and RMSE of 8.06.

## **Broadcast Workflow Automation: ExtendScript System**

Technologies: Adobe ExtendScript, Premiere Pro

- Developed automated batch export system enforcing broadcast specifications.
- Standardised file naming conventions and output formats.
- Reduced repetitive manual processing and minimised compliance errors.

## **Rocky Creek Homestead: Booking & Performance Optimised Website**

Technologies: WordPress, LiteSpeed Cache, QUIC.cloud CDN

- Designed and deployed booking-enabled website with availability workflow integration.
- Managed hosting infrastructure, DNS configuration, and domain migration to support production website deployment.
- Improved website performance and load times through caching optimisation and CDN integration.

## **ABS Census Form: Front-End Implementation**

Technologies: HTML5, CSS3

- Developed structured, accessible multi-section data collection form.
  - Implemented client-side validation balancing usability and data integrity.
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# **PROFESSIONAL EXPERIENCE**

## **Managing Director & Technical Lead**

Foxtail Productions | 2016 – Present

- Managed end-to-end delivery of commercial media and digital projects across client communication, technical production, compliance and deployment workflows.
- Led operational decision-making, workflow optimisation and technical implementation across production systems and client deliverables.
- Coordinated cross-functional project execution under strict deadlines and broadcast compliance requirements.

## **Camera Operator & Technical Crew**

Toowoomba Speedway | 2015 – Present

- Operate live broadcast systems in high-pressure environments requiring rapid decision-making.
- Configure AV equipment and maintain system reliability during real-time events.

## **Video Editor & Camera Operator**

Channel 9 Toowoomba | 2016 – 2017

- Produced broadcast news content under strict time constraints.
- Ensured technical compliance with broadcast standards and delivery specifications.