

# NICOLAI SKOGSTAD

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## Technical Skills

- **Languages:** Python, Java, JavaScript, SQL, HTML5/CSS, C, Rust, TeX
- **Developer Tools:** Git, GitHub Actions, VS Code, Vim, Emacs, Visual Basic, Microsoft Office, Docker, AWS
- **Libraries/Frameworks:** ReactJS, Node.js, Spring Boot, FastAPI, Quill, JWT Auth, .NET, MongoDB, PostgreSQL
- **Environments/OS:** Ubuntu, Arch Linux, Kali Linux, Kubernetes, L<sup>A</sup>T<sub>E</sub>X

## Experience

### University of Melbourne Rover Team

Software Engineer

Apr 2024

- Developed cross-platform telemetry UI with **WebAssembly**, improving refresh responsiveness by **8.5%**.
- Refactored core modules in **Rust**, reducing boot time by **10–15%** and improving memory use by **5%**.
- Integrated **GStreamer** into **egui (WebGL)**, enabling smooth, GPU-accelerated video feeds.
- Implemented async I/O with **Tokio**, lowering rover network latency by **10–15%**.

### Melbourne Space Program

Software Engineer

Jan 2025

- Built **random forest anomaly-detection model** in **scikit-learn**, reducing sensor spillage incidents by **70%**.
- Optimised **multithreaded C++ pipelines** with **ZeroMQ**, decreasing data processing latency by **10ms**.
- Tuned **PID controller** parameters for robotic arm, improving trajectory accuracy by **20%**.
- Deployed **Prometheus + Grafana** with custom exporters, reducing downtime by **15–20%**.

### EMU5 – VEX U Robotics

Software Engineer

Apr 2024

- Engineered modular **hardware–software interfaces** for robotics platforms, increasing subsystem flexibility.
- Designed real-time pipelines for **sensor fusion**, boosting responsiveness during competitions.
- Delivered prototypes with mechanical/electrical teams, shortening iteration cycles by **5–8%**.
- Optimised core logic in **Rust**, improving consistency and execution speed.

### Melbourne University Racing (MUR) Motorsports

Software Engineer

Jan 2024

- Developed **Python/C++ telemetry tools** for real-time car performance insights during testing.
- Built **robust automated simulation workflows**, significantly accelerating design validation by **5%**.
- Automated data collection pipelines with **Python**, saving **10+ hours per cycle** in manual effort.
- Integrated software with **embedded controllers**, enabling seamless subsystem communication.

### CISSA – Computing and Information Systems Students Association

Industry Officer

Jan 2025

- Partnered with **EY, Xero, Optiver, and Atlassian** to deliver career events for **2,000+** CIS students.
- Collaborated with a **70+ member cross-functional team**, driving outreach and event delivery.

## Projects

### Forensic Media Authenticity Platform

NodeJS   Typescript   PostgreSQL   AWS S3   Docker

- Front-end engineer on a small team building an investigator portal to upload suspect media and view authenticity scores.
- Integrated upload, job states, and results views with FastAPI endpoints so inference status was clear and actionable.
- Coordinated with backend on signed S3 ingestion and a PostgreSQL audit trail to keep artifacts traceable and UI accurate.
- Contributed to handoff docs and docker-compose setup to make the stack easy to run for new contributors.
- Led mid-tier/front-end integration to align API contracts and ensure clean data flow into UI states.

### Collaborative Document Editor

React   Socket.IO   Quill   Node.js   MongoDB

- Built a real-time editor to explore collaborative editing, syncing changes across clients without collisions.
- Integrated React + Quill to emit and apply delta updates in real time for smooth co-editing.
- Implemented per-document Socket.IO rooms so updates only broadcast to collaborators on the same doc.
- Added idle-based autosave to MongoDB to persist edits without excessive writes.

## Education

### University of Melbourne

Jan 2023

Bachelor of Science, Computing and Software Systems

Melbourne, VIC

**Co-Curriculars:** Melbourne Student Forum Delegate, Engineering Open Day Volunteer, Hackathon Participant/Organizer, Career Fair Volunteer, Open Source Contributor. Committee Member (5+ clubs), Student Representative.