Shashwat Singh

shashwatsingh5021@gmail.com | +61 410 150 202 | linkedin.com/in/shashwat-singh | shashwatsingh67.github.io

EDUCATION

University of Adelaide — Mar 2025 – Present
Bachelor of Electrical and Electronic Engineering and Bachelor of Math and Computer Science

Noorwood International High School — Feb 2020 – Nov 2024

PROJECTS

Image Convolution Engine (C++20):

- Developed a high-performance image convolution engine in C++20 implementing Gaussian blur with configurable **kernel generation**, **padding strategies**, and **float-precision processing** in a modular pipeline.
- Achieved a 5.37x speedup (**81% runtime reduction**) by refactoring direct 2D Gaussian convolution ($O(N \cdot K^2)$) into a **separable 1D implementation** ($\mathbf{O(N \cdot K)}$) benchmarked on 612 x 460 RGB images 11 x 11 kernels.
- Validated numerical correctness against the direct 2D method using mean squared error (4.6e-15) and maximum absolute error (6.5e-7), confirming **floating-point equivalence.**
- Built a **benchmarking** framework (20+ runs, mean/std computation) that outputs structured CSV performance reports for **quantitative scalability analysis**.

Algorithmic Trading Bot Trainer (Qt, C++):

- Used Qt and C++ to build a trading simulator that allows users to test different trading strategies in a **simulated market** environment.
- Collaborated and combined code in a team of three Object-Oriented fashion to create automated trading algorithms, interactive price and trading history charts, and **real-time performance tracking.**
- Applied polymorphism across core trading, charting, and data-handling classes to standardise behaviour and prevent type-specific failures, improving **system hierarchy** and **data conversion stablity**.

COMMUNITY INVOLVMENT

Adelaide Competitive Programming Club (ACPC) — Feb 2025 – Present

- Sponsorhips officer
  - Constructing structured outreach pipelines and maintained corporate correspondence to acquire sponsorships from industry partners.
  - Personally outreached with colleagues and friends from university to gain company connections.

Adept Rocketry Division

- Avionics team member — April 2025 – Present
  - Working in a close knit team that engineered a rocket from scratch and undertook the development of the avionics payload specifically working with an **Inertial Mesearment Unit** and **Barometric pressure sensor**.
  - Performed **sensor fusion testing**, hardware in-loop-validation and implemented **onboard data logging system** used for offline multiple axis coordinate at a 30 Hz sampling rate.
  - Optimised flight-data visualisations by refining 3D-graph generation scripts and improving clarity for multi-axis coordinate plots.

Adelaide Rover Team — July 2025 – Present

- Chassis lighting system team member
  - Designed schematics and developed industry standard PCB's on Altium.
  - Worked closely with various sub-teams, contributing within a coordinated, multi-team professional setting.
  - Optimised PCB design with **reverse-polarity protection** and **maximum stand-off voltage** considerations, minimising electrical failure risk and enhancing overall system reliability.

AWARDS & ACHIEVMENTS

Susquehanna Algothon: — July 2025

- Built a Python-based trading algorithm designed to maximise profits in a simulated market environment.
- Applied **Sharpe-optimised reward functions** to improve risk-reduction decision-making.
- **Reduced portfolio volatility by ~10–20%** compared to baseline strategies in simulation testing.

2025 Datathon, Society of Quantatative Analysis and Data (SQUAD) — April 2025

- Placed 4th in a university-wide 18-hour datathon as part of a three-member team, developing a machine-learning solution by implementing a **python based random forest**.
- Responsibilities included data preprocessing, exploratory analysis, model development, and hyperparameter optimisation.
- Optimised feature selection and by **analysing** and **cleaning relevant** datasets to identify top predictive features, removing low-value variables and reducing training dataset noise, which **improved model learning efficiency by ~15%.**
- Enhanced predictive accuracy by implementing a **Random Forest classifier** with **hyperparameter tuning** (200 trees), a 80% accuracy (4% improvement over base models) and **99% efficiency of the industry model.**

Adelaide Competitive Programming Club (ACPC) — Feb 2025 – Present

- Participated in high-rigour competitive programming contests involving **algorithmic problem solving** under time constraints including Adealide Uni Competetive Programming League (AUCPL), AllUni and the South Pacific ICPC Preliminary Contest.
- First solved a question in All Uni against 300+ competitors across Australia and New Zealand

SKILLS

Languages: C++, C, MATLAB, Python

Technologies: STM Cube IDE, Arduino IDE, Altium, Git