Asad Rizvi

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Education

University of New South Wales
Bachelor of Mechatronic Engineering (Honours) / Computer Science, WAM: 80.23 May 2026

Skills Summary

Computer Science
- **Programming Languages:** C/C++, Python, Java, JavaScript, Rust, Assembly, SQL
- **Software Engineering:** Data-Structures & Algorithms, Object-Oriented Programming, Concurrency-Safe Design, Agile, Firebase
- **Operating System Development:** Critical Sub-Systems, Drivers, Multiprocessing
- **Source Control:** Git, Branch Management, Pull Requests
- **Unix:** Bash Scripting, Command-Line Operations
- **Debugging & Testing:** Unit & Component Testing
- **Databases:** SQL Queries, psycopg2, PostgreSQL, Firestore

Mechatronic Engineering
- **CAD/CAM:** SolidWorks
- **Simulation:** Matlab, Systems Tool Kit
- **Control Systems Design:** Linear Systems, State-Space Modelling, Matlab Simulations
- **Composite Materials:** Manufacture & Testing
- **Robotics:** Design, Path Planning, Computer Vision
- **Numerical Methods & Statistics:** Probability, Estimation Confidence, PDF/CDFs, Kalman Filters
- **Engineering Mechanics:** Statics, Dynamics, Solids
- **Communication:** Technical/Progress Reports & Documentation, Jira, Project Coordination, Latex

Projects & Practical

Microkernel Operating System (C)
- Designed and accomplished a fully functional operating system on top of the seL4 Microkernel
- Developed multi-threaded execution model, memory management systems, demand paging, filesystem architecture, and process control modules
- Configured clock driver, re-routing standard C-library system calls
- Ensured POSIX compliance where relevant: File descriptors, Memory allocation
- Balanced design priorities between security, performance, specification and usability
- Collaborated on team project using Git for branch maintenance and merge requests

FinTech Application Prototype (React/Node.js/Firebase)
- Led 6-person team as Scrum Master in an Agile workflow, delivering Docker containerised MVP with CI/CD pipeline
- Architected full-stack digital wallet integrating Zai payment API for real-time transfers and multi-currency support
- Engineered daylight savings time-aware recurring payment scheduler with automated transaction processing and notifications
- Optimised database performance via parallel queries and multi-level caching, reducing API calls by 70%

Composite Material Manufacturing
- Manufactured low-ply carbon and glass fibre laminates using vacuum-assisted resin infusion
- Conducted tensile and bending tests to verify material properties
- Analysed material performance metrics including Young's modulus, ultimate tensile strength, and fibre content

Maze Solving Robot (C & Python)
- Built autonomous robot for a maze navigation challenge in a team of 4
- Integrated computer vision for path planning, PID controllers for grid traversal, and LIDAR sensors for obstacle avoidance
- Optimised control algorithm for wall-tracing behaviour, increasing linear speed by up to 20%

Interplanetary Satellite Mission (Matlab/STK)
- Devised interplanetary trajectory, with considerations for target orbit elements and manoeuvre calculations including: Earth escape, gravitational sphere of influence and perturbations
- Utilised Hohmann transfer for optimising fuel requirements
- Programmed a simplified model for rocket launch and subsequent burns

Experience

Casual Academic — University of New South Wales Aug 2025 – Current
- Demonstrated for MTRN3500 - Computing Applications in Mechatronic Systems
- Conducted one-on-one and group help sessions for undergraduate students
- Marked assignments and provided feedback on student work and key concepts

Customer Service Representative — Domino's Pizza Nov 2018 – Jan 2021

- Prepared equipment and food, ensuring readiness for peak service periods
- Provided customer service, resolved concerns and distributed orders