

KALAN FERGUSON

kalanferguson005@gmail.com | 0426 060 934 | Brisbane, QLD | Australian Citizen (NV1 eligible) | linkedin.com/in/kalanferguson-288858326

CAREER OBJECTIVE

Third-year Mechanical Engineering student (Aerospace Minor) at QUT, with a Year 2 Major GPA of 6.4/7.0. I apply a rigorous analytical approach to mechanical systems, spanning kinematic simulation, stress and fatigue modelling, and structural failure analysis. My self-directed study of Australian **sovereign defence platforms**, including the MQ-28A Ghost Bat program, reflects a genuine commitment to aerospace and defence engineering. Seeking a 2026 internship within the **aerospace, defence, or advanced manufacturing** sectors.

EDUCATION

Bachelor of Mechanical Engineering (Honours) | Aerospace Minor

QUT | Expected Dec 2027

- **Year 2 Major GPA: 6.4/7.0** | Cumulative GPA: 5.8/7.0
- **QUT Executive Dean's Commendation** for Academic Excellence (awarded for ≥ 6.5 semester GPA)
- **High Distinctions:** Thermodynamics, Foundations of Electrical Engineering, Mechanical Design, Engineering Mathematics & Statistics
- **Current units:** Aircraft Systems & Flight, Dynamics of Machines, Design of Machine Elements, Fluid Mechanics

TECHNICAL PROJECTS

3-Stage Planetary Gearbox | Design, Analysis & Physical Testing

2025

- Designed and physically tested a 3-stage acrylic planetary gearbox prototype, achieving successful torque transmission to the **20 Nm design target** before controlled failure.
- Performed full fatigue and static stress analysis - including finite element analysis (FEA) via ANSYS and analytical modelling using Lewis factors, Von Mises criteria, and fatigue stress concentration factors for validating safety factors across all three stages for bending and contact failure modes.
- Documented a sequential failure progression under incremental loading; housing torsional twist \rightarrow planet gear radial slip \rightarrow tooth misalignment \rightarrow tooth fracture - attributing root cause to housing compliance rather than material strength inadequacy.
- Produced a formal design report recommending dual-sided carrier plates, increased gear face width, and housing rigidity improvements to address identified failure mechanisms.

F-35B 3-Bearing Swivel Duct (3BSD) | Independent Mechanical Study

2025

- Completed a fully constrained parametric SolidWorks assembly of the 3-stage vectoring nozzle, capturing non-orthogonal rotational synchronisation across the full thrust-deflection range.
- Simulated swivel action through motion study, verifying geometric clearance and range-of-motion at each deflection stage.
- Resolved mechanical interference and volumetric constraints within the swivel junction through iterative geometric refinement.

MQ-28A Ghost Bat | Independent Technical Analysis

2025 - Present

- Conducted self-directed systems-level analysis of the MQ-28A program, covering autonomous architecture, sensor fusion integration, modular payload design, and sovereign manufacturing implications.
- Published technical commentary on Australian defence capability, AUKUS alignment, and Indo-Pacific airpower strategy; available publicly at x.com/KalanInvests.

PROFESSIONAL EXPERIENCE

Installer Assistant | Brisbane Glass Splashbacks

Sep 2024 – Aug 2025

- Maintained ± 1 mm installation tolerances across 300+ custom glass units in residential and commercial environments.
- Applied technical drawings and spatial reasoning to solve on-site alignment and fit-up constraints.
- Managed material integrity and structural fitting in high-value, risk-sensitive installations.

Warehouse Logistics | LSKD Loganholme

Nov 2024 – Jan 2025

- Processed 5,000+ orders under KPI-driven throughput targets, demonstrating precision and operational reliability.

Team Member | Valley Way Pizza

Mar 2021 – Dec 2024

- Maintained consistent quality standards over 3+ years of continuous employment; demonstrated reliability and sustained work ethic.

TECHNICAL SKILLS

Mechanical Analysis: Stress/strain, bending & torsion, fatigue (Lewis/Von Mises), failure mode identification, FBDs

CAD & Simulation: SolidWorks (parametric assembly, motion study), ANSYS (Static structural FEA), XFLR5 (aerofoil & wing analysis)

Systems & Dynamics: Kinematic simulation, multi-body dynamics, thermodynamic cycle analysis, flight systems

Programming & Tools: MATLAB/Simulink, Arduino/C++, Microsoft Excel, technical report writing

ADDITIONAL ACTIVITIES

- QUT Aerospace Society member; attending industry events and technical seminars.
- Independent technical research in Australian sovereign defence platforms and autonomous systems; published analysis of the MQ-28A Ghost Bat and Anduril defence technology ecosystem.