Toby Luke Anderson

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PROFILE

Robotics and Mechatronics Engineering (AI) and Physics student with hands-on experience in autonomous systems, robotics software, and simulation-driven system design. Strong interest in long-horizon autonomy, constraint-based planning, and robotics applications in complex or extreme environments.

EDUCATION

Monash University, Clayton, VIC
Bachelor of Engineering (Honours) / Bachelor of Science
Specialisation: Robotics & Mechatronics Engineering (AI) and Physics (Astrophysics)
2025 – Present

TECHNICAL SKILLS

Programming & Software
Python, C++, ROS2, Git, Linux, basic machine learning pipelines

Robotics & Embedded Systems
Arduino, Raspberry Pi, sensors and actuators, control systems, hardware–software integration

Engineering & Analysis
Autonomous navigation, simulation environments, constraint-based system design, data analysis

EXPERIENCE

Autonomous Systems Team Member — *Monash Nova Rover*

2025 – Present

- Developed and tested autonomous navigation systems using sensor fusion (LiDAR, stereo cameras, IMU)
- Implemented path planning and obstacle avoidance algorithms under real-time constraints
- Built computer vision modules for object detection, classification, and localisation
- Integrated C++ and Python modules within the ROS2 framework on physical rover hardware
- Collaborated within a multidisciplinary engineering team to debug and validate system-level behaviour

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Independent Research Engineer — *Standard Template Construct (STC)*

2025 – Present

- Designed a modular framework for autonomous system planning under resource and environmental constraints
- Developed simulation and planning tools to evaluate feasibility of complex engineering scenarios
- Investigated trade-offs between automation, robotics, and human involvement in system design
- Applied robotics, AI, and physics-based reasoning to planetary and remote-environment use cases

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Research Team Member — *Melbourne Bio Innovation Student Initiative (MBSI)*

2025

- Conducted early-stage technical feasibility research for a proposed chronic kidney disease diagnostic system
- Investigated embedded systems, AI-based analysis, and spectroscopy as candidate technologies
- Contributed to system-level concept design and validation rather than prototype development
- Presented findings to an industry panel from biotechnology and medical technology sectors

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PROJECTS

Standard Template Construct (STC)

Independent research project exploring constraint-based planning, modular system architecture, and autonomous decision-making for complex engineering problems, with applications to robotics and extreme environments.

AFFILIATIONS

- Monash Nova Rover

- Monash Engineering Students Society

- Engineers Australia