# Johan van Tonder

Graduate Mechatronics Engineer | Controls | Automation | Embedded Systems

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## PROFESSIONAL SUMMARY

Mechatronics Engineering Honours graduate from The University of Queensland with practical experience across control systems, embedded systems, robotics, manufacturing engineering, instrumentation, CAD, data visualisation and technical documentation. Currently working on an industry Spintron/camshaft dyno project involving system architecture, sensor integration, VFD/motor interfaces, encoder feedback, laser displacement measurement, dashboard concepts and implementation documentation. Interested in graduate roles across mechatronics, controls, automation, embedded systems, project engineering and systems integration.

## EDUCATION

**Bachelor of Engineering Honours - Mechatronics Engineering**

*The University of Queensland | Graduated November 2025 | GPA: 6.1 / 7.0*

Relevant areas: control systems, embedded systems, robotics, instrumentation, electrical/electronic systems, mechanical design, software development, data analysis, engineering modelling and technical project work.

## TECHNICAL SKILLS

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|---|---|
| **Controls and automation** | PID control, state-space control, LQR, system modelling, feedback control, motor control, actuator control, VFD/motor concepts, signal conditioning, data acquisition. |
| **Embedded and electronics** | STM32/NUCLEO development boards, ADC measurement, sensor interfaces, motor drivers, PCB design, wiring diagrams, RS485/RS422/Modbus fundamentals, noise/isolation awareness. |
| **Programming and data** | Python, MATLAB, Simulink, Embedded C, C/C++, HTML, CSS, JavaScript, Git/GitHub, Microsoft Office, data cleaning, time-series analysis, dashboards and visualisation. |
| **CAD and documentation** | Autodesk Inventor, SolidWorks, Fusion 360, EasyEDA, GD&T;, BOMs, technical reports, functional descriptions, assembly documentation and maintenance documentation. |

## ENGINEERING EXPERIENCE

### Waggot Cams

*Engineering Work Experience - Spintron / Camshaft Dyno Project | May 2026 - Present*

- Working on the development of a Spintron/camshaft dyno concept for high-speed valve-train testing, with focus on system architecture, sensor integration, wiring documentation, data capture and operator interface design.
- Developed a proposed architecture connecting a Windows PC, STM32 NUCLEO-H743ZI2 microcontroller, 45 kW VFD/motor system, differential encoder, Keyence laser displacement sensor and supporting interface electronics.
- Mapped signal paths and data flows for encoder measurement, laser displacement measurement, VFD communication, high-speed logging and PC-to-microcontroller data transfer.
- Developed dashboard concepts for RPM programming, live telemetry, measurement windows, run logging, saved run review and operator-friendly system visibility.
- Produced wiring diagrams, purchasing notes, assembly documentation and clear explanations to support future build and commissioning work.
- Analysed CNC camshaft grinder output data and created visual tools to inspect cam lobe profiles, machining behaviour, point counts and motion paths.

### Marquis Macadamias

*Engineering Intern / Engineer Trainee | Jan 2025 - Mar 2025*

- Supported engineering work in a live food manufacturing environment with production, maintenance and engineering teams.
- Created and updated CAD models, drawings, BOMs, GD&T documentation, brownfield measurements and installation-focused design updates.
- Assisted with commissioning-related activities, functional checks, maintenance documentation, preventive maintenance checklists and CMMS task information.
- Worked with operators, trades, suppliers and engineers to clarify requirements, understand practical constraints and support reliable implementation.
- Built practical understanding of process improvement, operational reliability, documentation quality and stakeholder communication in manufacturing.

## SELECTED ENGINEERING PROJECTS

### Spintron / Camshaft Dyno Control and Data System

*Industry work experience project | 2026*

- Designed a control and measurement concept to turn machine and sensor data into live dashboards, run programs, saved test data and practical implementation documentation.
- Planned synchronised encoder and laser displacement measurement, Ethernet-based PC data flow, VFD communication concepts and operator workflow for testing.

### 6DOF Robot Arm Simulation and Control

*University / personal robotics project*

- Modelled, simulated and controlled a 6DOF robot arm using inverse kinematics, trajectory planning and MATLAB/Simulink-based validation.
- Developed understanding of robotics kinematics, workspace limits, joint motion, path following and mechatronic system integration.

### CNC Camshaft Grinder Data Visualiser

*Waggot Cams data visualisation project | 2026*

- Created visual tools to convert raw CNC grinder output data into inspectable lobe profiles, point-density views, machining paths and comparison plots.
- Demonstrated data cleaning, technical visualisation and transformation of machine data into engineering review information.

### Ultra-Flat Micro Servo Actuator

*Honours thesis project | 2025*

- Designed and modelled an ultra-flat servo actuator combining compact CAD packaging, spur/worm gearing, magnetic position sensing, PCB design and closed-loop control simulation.
- Simulation achieved high torque performance with useful trade-off analysis between speed, torque, current limits, efficiency, backlash and manufacturability.

## ADDITIONAL STRENGTHS

- Strong practical interest in industrial control systems, automation, robotics, instrumentation, embedded systems and systems integration.
- Comfortable working across mechanical, electrical, software, CAD and documentation tasks.
- Able to communicate technical ideas clearly through diagrams, written explanations, dashboards, reports and structured documentation.
- Strong self-directed learning ability and willingness to develop under experienced engineers in multidisciplinary project environments.