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Kelvin Le

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Summary

Kelvin is an **undergraduate Mechatronics Engineer**, pursuing the bachelor degree at **Queensland University of Technology**. He has a strong passion on addressing real-world challenges with an engineering mindset, particularly through the application of robotics.

Technical Skills

- **Robotics & Control System: ROS2** (Docker, ros2_control framework, ...), **MATLAB & Simulink** (Control).
- **Embedded Systems:** STM32, ESP32, **IOT systems**, AVR Series, Raspberry Pi, **Linux-based Embedded System**.
- **Hardware Design**: **CAD Design** (SolidWorks, Inventor), **Circuit & PCB Design** (Altium Designer, LTSpice)
- **Machine Learning & Computer Vision**: Computer Vision with **OpenCV**, LLM and Machine Learning on **AWS & Google Colab**.
- **Programming Languages: Python** (ROS2, Machine Learning, Embedded), **C/C++** (Embedded systems,ROS2 integration, System Programming), **C/C++** (OOP), **HTML/CSS/JavaScript** (Web Development).

Education

Queensland University of Technology, BS in Mechatronics/Aerospace — Jan 2023 – Dec 2026

- GPA: 6.7/7.0 (Academic Transcipt)
- **Coursework:** Computer Architecture, Comparison of Learning Algorithms, Computational Theory
- **Achivements & Certifications: QUT Dean's Scholar**, Executive Deans' Commendation for Academic Excellence (2023-Now), Virtual Peer Learning Leader (2023-Now)

Qualifications & Certifications

Generative AI with Large Language Models — issued by DeepLearning.AI

- **Coursework & Skills:** Computer Architecture, Comparison of Learning Algorithms, Computational Theory

Introduction to Machine Learning on AWS — issued by AWS

- **Coursework & Skills:** Artificial Intelligence, Machine Learning, AWS SageMaker, Large Language Models

Experience

Robotics Engineer Intern, QUT Motorsport Design Internship – Brisbane, QLD — Nov 2024 - Feb 2025

- Improved vehicle (QEV-3D) performance by **20%** by replacing the custom ROS2 controller component with built-in controllers from the `ros2_control` framework.
- Migrated and optimized the existing ROS2 Humble base to the lattest base.
- Ensured **70%** effective of LiDAR point cloud by tuning the ground segmenter & refined LiDAR cone detection.
- Implemented CANBUS package for the vehicle to communicate with the Hardware, ECUs.

CAD/PCB Designer, AAA Salon Supply – Brisbane, QLD — Dec 2022 – Nov 2023

- Designed and finalized CAD models for salon equipment, including UV lamps and tools, ensuring functionality.
- Validated prototypes and final products, providing design enhancements for improved performance.
- Developed and manufactured PCBs for prototypes using 3D printing and advanced PCB design techniques.

Robotics/STEM Instructor, Junior Engineers – Brisbane, QLD — Nov 2023 – Now

- Cooperating with the team to develop a curriculum for the program in (AI, Robotics, web programmming).
- Leading classes with < 20 students in varying age groups (7-14) to teach about robotics and programming
- Designed and manufactured PCBs and 3D-printable, assemblable robot parts for teaching materials.

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STEM Lead Instructor, CodeCamp – Brisbane, QLD Nov 2023 – Now

- Working closely with the team to deliver a drones programming 3-day camp with < 20 students.
- Managing after-school classess of Scratch programming for kids aged 7-14.

Projects

"SmileBot" Autonomous Warehouse Robot (TRL3 Prototype) github/smilebot

- Ensured vision system accuracy by implementing a RGB camera and an object detection using OpenCV.
- Developed and manufactured developement board PCB for the robot, connecting Embedded systems and sensors, actuators, I/O terminal via I2C communication protocol.
- Design and manufactured robot chassis and gripper ensuring the robot's stability and durability.
- Tools Used: **ROS2, Python, C, OpenCV, Altium Designer, Google Colab, SolidWorks.**

ROS2-based "Diff-bot" Robot github/diff-bot

- Hardware developed from "SmileBot" Autonomous Warehouse Robot, adding a display for GUI.
- Implemented ROS2 Differential Drive controller from ros2_control framework.
- Set-up and optimized the ROS2 navigation stack for the robot. **YOLOv5** trained for object detection.
- Hardware Interface with the robot's sensors and actuators.
- Tools Used: **ROS2, Python, XML, ros2_control, C/C++, OpenCV, Google Colab.**

Mini DC Power Supply (Finished)

- USB Type-C for charging/discharging and banana plug for output.
- OLED display for GUI, voltage/current monitoring, and 3D-printed industrial case.
- 4× 21700 Li-ion batteries (16,000 mAh) with IN/OUT circuit, delivering up to 100W.
- Tools Used: **PCB design, C, Altium Designer, SolidWorks, 3D-printing.**

"Quadro" Quadcopter (Further Developemnt Planned) github/quadro-quadcopter

- **Kalman filter** for IMU sensor fusion, PID control for stabilization.
- Designed, 3D-printed frame, propeller. **Toroidal Propeller** to increase Efficiency & Thrust while reducing noise.
- AutoPilot Board developed and manufacured for the quadcopter, using ESP32 and IMU9250.
- Controlled by an emmbedded system with a custom-built controller via I2C communication.
- Tools Used: **C/C++, AutoDesk Eagle, SolidWorks, PID control, Kalman Filter Computer Vision.**