

Luke Birchenough

Mechatronics Engineer

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Summary

Mechatronics Engineer with 5 years of experience building industrial measurement systems in the railway industry. Skilled in software development, from computer vision and machine learning to building full-stack web applications. Combines strong analytical and technical abilities with an engineering mindset and hands-on experience in hardware and system integration, sensor calibration and end-to-end testing. A fast learner and practical problem-solver with a background in customer service and education that supports clear communication and collaboration across multidisciplinary teams. Motivated by challenging problems and complex systems.

Skills

- **Programming:** C#, C++, Python, JS/TS
- **Full-Stack:** ASP.NET Core, Next.js, React, Angular, REST APIs, SQL, SaaS Integrations
- **Computer Vision & Machine Learning:** Camera/Laser Measurement, Camera Calibration, Object Detection, Image Segmentation
- **Robotics & Embedded:** ROS, SLAM, Microcontrollers
- **Cloud and DevOps:** AWS, Azure, Docker, Terraform, Git, CI/CD Pipelines

Professional Experience

Solutions Engineer | Siemens Mobility MRX

2020 – 2025

Member of the software team developing computer vision and laser-based systems for automated measurement and detection of train components. Worked across both software development and hands-on engineering activities, including hardware integration, system setup and configuration, testing, and validation.

Responsibilities

- Developed and maintained measurement processing software and supporting microservices (C++) for Next-Generation and legacy products.
- Built internal tools (Python, Bash) to streamline troubleshooting and automate workflows.
- Managed containerised deployments (Docker Compose/Swarm) across multi-system sites, handling service configuration and integration.
- Delivered remote technical support for systems across international sites, resolving critical hardware and software issues.
- Performed initial site commissioning including database seeding and system configuration.
- Trained object detection and segmentation models for integration into Visual Inspection products.

- Set up Grafana dashboards to monitor embedded sensor activations and computer system performance.
- Configured embedded systems to fine-tune sensor triggering and activation parameters.
- Performed camera calibration, sensor alignment, and measurement validation across multiple systems.
- Executed Factory Acceptance Testing (FAT) and Site Acceptance Testing (SAT), producing technical documentation and customer reports.
- Integrated system hardware and software to enable end-to-end system functionality.
- Produced 3D models and assemblies for measurement processing simulation.

Achievements

- Key contributor across the Next Generation (NxG) Wheel Profile Measurement System (WPMS) development lifecycle, from R&D and prototyping to end product, covering measurement processing software, system builds, and hardware integration. Led final testing and verification, delivering the first Next-Generation WPMS shipment.
- Led a small team as software technical lead on a two-month deadline project, identifying a critical software incompatibility and delivering a successful solution on schedule.
- Created the core FAT procedures adopted across the NxG product line and personally led the build, integration, and FAT of five systems through to shipment.
- Completed SAT for six separate projects, producing detailed reports and managing customer feedback cycles to secure key milestone payments.

Robotics Intern | Woodside Energy

2019 - 2020

- **Developed** python-based ROS nodes to interface with an embedded microcontroller, enabling dynamic LED pattern control for real-time robot status indication and operational safety.
- **Integrated** a roller door controller with an IP camera to enable remote operation and visual verification. Implemented control logic enabling autonomous robot facility access.

Digital Imaging Support Officer | Henry Schein Halas

2013 - 2015

- **Delivered** on-site technical support and customer service for dental imaging systems across WA and SA, liaising directly with clinic staff to resolve installation and hardware issues.
- **Executed** preventive maintenance programs including routine calibrations increasing system reliability.

High School Teacher | Darling Range Sports College

2011 - 2012

- **Taught** IT curriculum for Years 9–12, covering computing and digital technologies to secondary students.
- **Collaborated** with teaching staff to develop and enhance learning programs.

Education

Bachelor of Engineering (Honours, First Class) – Mechatronic Engineering

Curtin University, 2016 – 2020

Projects

Heavy focus on web technologies and expanding full-stack development capabilities. See [projects](#).

- [TeacupBoutique](#): E-commerce platform with microservices and event-driven architecture, built with ASP.NET Core and React.
- [IoT Pipeline](#): ESP8266 posting sensor data to a cloud-native AWS pipeline. Provisioned with Terraform.

Certificates

- [AWS Certified Cloud Practitioner](#) - Developed cloud fluency and foundational AWS knowledge.
- [Robotics Software Engineer](#) - Localization, mapping and navigation using ROS.

References

Available upon request.