

Udana Jayasekara

Manufacturing Engineer | Industry 4.0 | Advanced & Digital Manufacturing

su.jayasekara@outlook.com | udanajayasekara.com | linkedin.com/in/su-jayasekara

Melbourne, VIC | Open to relocation Australia-wide

Full Australian working rights, Temporary Graduate visa (subclass 485) valid to March 2028. No sponsorship required.

PROFESSIONAL SUMMARY

Manufacturing engineer with a Master of Engineering (Manufacturing) from RMIT, completed with a GPA of 3.8. Two of my design for manufacture and assembly projects produced measurable results: an optical mouse redesign that reduced the part count from 18 to 7 and assembly time from 287 to 29 seconds, and a wheel changing device where assembly time and cost each fell by 68%. My thesis developed digital twins from photogrammetry and established the conditions under which the technique fails. I have also built industrial monitoring using OpenPLC and Node-RED, and redesigned a load-bearing bracket for laser powder bed fusion. Earlier commercial work in embedded hardware covered design, prototyping and testing. I am seeking roles in process improvement, DFMA or Industry 4.0.

TECHNICAL SKILLS

Manufacturing and Industrial Engineering: Design for Manufacture and Assembly (DFMA/DFA), Boothroyd–Dewhurst analysis, Design for Additive Manufacturing (DfAM), assembly time and cost estimation, process improvement, manufacturing systems modelling, queueing analysis, supply-chain and transportation planning

Industry 4.0 and Automation: OpenPLC, e!COCKPIT, Structured Text (IEC 61131-3), ladder logic, Modbus, MQTT, Node-RED dashboards, digital and analogue I/O configuration, sensor emulation, digital twin

CAD and Engineering Analysis: SolidWorks, Fusion 360, AutoCAD, Inventor, 3D assembly modelling, finite element analysis, motion analysis, stress and factor-of-safety evaluation, material selection

Additive Manufacturing: Laser powder bed fusion (L-PBF), FDM, build-orientation planning, support strategy, Z-Suite, Z-ABS parameter selection, post-processing evaluation, print benchmarking

Digital Tools: Bentley iTwin Capture Modeler and ContextCapture, iTwin Viewer, photogrammetry, MATLAB, Python, Jupyter Notebook

Supporting Skills: Arduino, sensor interfacing, PCB development, hardware and software integration, Linux, Proteus

ENGINEERING EXPERIENCE

Embedded System Development Engineer

Feb 2021 – Aug 2021

Aptinex (Pvt) Ltd., Sri Lanka

- Delivered five hardware and firmware modules from initial requirements through to production-ready design, covering component selection, schematic work, PCB layout, bring-up and debugging.
- Designed a P82B715 I2C bus extender as a matched transmitter and receiver board pair, together with a compact SIM800 GSM module, both within defined cost and board-space constraints.
- Developed ATtiny13 firmware for an AC dimmer using zero-cross detection and TRIAC firing control, and an Arduino driver library for the AM1805/AM1815 ultra-low-power RTC.
- Specified the hardware architecture for a customisable BLDC e-bike controller against client and brake-system requirements.
- Performed circuit-level troubleshooting and prototype validation throughout the role.

ADDITIONAL EXPERIENCE

Team Member

Jan 2023 – Present

Woolworths Group, Melbourne VIC

- Maintained continuous part-time employment for over three years while completing two full-time master's degrees, working across grocery, nightfill and fresh food departments.

Electronics and Design Engineer (Trainee)

Sep 2021 – May 2022

Nemark Technologies (Pvt) Ltd., Sri Lanka

- Supported the design and configuration of solar power generation systems, assisting with component selection and system layout.
- Assisted senior engineers with practical electrical and electronic engineering tasks.

EDUCATION

Master of Information Technology (GPA 3.6 / 4.0)

Feb 2024 – Dec 2025

RMIT University, Melbourne, Australia

Key modules: Cloud Computing, Practical Data Science with Python

Master of Engineering, Manufacturing (GPA 3.8 / 4.0)

Feb 2023 – Dec 2023

RMIT University, Melbourne, Australia

Key modules: Advanced Manufacturing, Industry 4.0 Technologies, Manufacturing Systems Modelling

SELECTED MANUFACTURING AND INDUSTRY 4.0 PROJECTS

Optical Mouse DFMA Redesign

Design for Manufacture and Assembly Project

- Disassembled a Lenovo optical mouse, identified essential and non-essential components, and modelled the parts in SolidWorks to establish a manufacturing baseline.
- Applied Boothroyd–Dewhurst analysis across manual and semi-automated assembly scenarios. The redesign reduced the product from 18 parts to 7, reduced assembly time from 287 to 29 seconds, lowered manual assembly cost to approximately AUD 0.16, and achieved a DFA index of 73%.

Tools: SolidWorks, DFMA, Boothroyd–Dewhurst method, assembly cost analysis

Digital Twin Modelling with Photogrammetry

Master's Research Thesis

- Developed a workflow for producing digital twins from overlapping photographs using Bentley iTwin Capture Modeler and iTwin Viewer, with interactive markers and locally stored sensor data embedded in the model.
- Tested it across reflective, transparent, featureless, indoor, outdoor and dynamic scenes to establish where photogrammetric reconstruction fails on accessible hardware, and produced capture guidelines and mitigation strategies.

Tools: Bentley iTwin Capture Modeler and ContextCapture, iTwin Viewer, photogrammetry, 3D reconstruction

Wheel Changing Device DFA Redesign

Design for Assembly Project

- Developed an owner-assisted wheel changing device from initial concept through iterative sketching and CAD modelling, addressing lift, positioning and alignment during wheel installation.
- Quantified the redesign with the Boothroyd–Dewhurst method: assembly time fell from 285.5 to 90.47 seconds and cost from 114.2 to 36.18 cents, both a 68% reduction, while simplifying the part and fastener structure and improving portability.

Tools: CAD, DFA, Boothroyd–Dewhurst method, mechanical design, cost analysis

Industrial Monitoring and Control System

Industry 4.0 Project

- Programmed virtual PLC logic in Structured Text with OpenPLC and e!COCKPIT, configuring digital and analogue I/O addressing and implementing temperature-based control.
- Integrated the PLC with Node-RED over Modbus and developed a dashboard of gauges, charts, buttons and sliders, using sensor emulation and MQTT-style data flow to demonstrate the full path from acquisition through control to display.

Tools: OpenPLC, e!COCKPIT, Structured Text, Modbus, MQTT, Node-RED

Additive Manufacturing Redesign of Cantilever Seat Support

Advanced Manufacturing Project

- Recreated a cantilever train seat bracket in CAD and established its baseline structural performance under service loading using finite element analysis.
- Developed a lightweight design for laser powder bed fusion, assessed candidate alloys on strength-to-weight performance, compared original and redesigned structural behaviour, and determined print orientation, support and post-processing requirements.

Tools: SolidWorks, FEA, L-PBF, DfAM, material selection, build-orientation planning

Gearbox Design and Finite Element Analysis

Mechanical Design and Analysis Project

- Designed a one-speed gearbox in SolidWorks providing 8:1 reduction without reversing output rotation, modelling the full assembly of gears, keyed shafts, bearings and housing.
- Validated the drivetrain with motion analysis, then applied the resulting loads in FEA on the input shaft to evaluate stress, displacement, strain and factor of safety. The keyway was identified as the critical stress concentration, informing the design changes recommended.

Tools: SolidWorks, FEA, motion analysis, mechanical design

ADDITIONAL PROJECTS

- Design for Additive Manufacturing Benchmarking Model.** Fusion 360 test artefact assessing overhang angles, unsupported beams, holes, crescents, sharp corners and engraved text, prepared in Z-Suite for Z-ABS.
- Logistics and Operations Systems Analysis.** Distribution network modelled across plants and international demand centres, comparing truck, rail and cargo-ship flows with fleet sizing and queueing-based capacity recommendations.
- Automated Sorting System.** Three-station PLC cell with pneumatic actuators, vacuum pick-and-place and sensor-based sequencing.

PROFESSIONAL RECOGNITION

Member, Engineers Australia

Dec 2021 – Present

Engineers Australia skills assessment: Engineering Professionals NEC (Mechatronics Engineer)