

PRASHIL RAJ SHRESTHA

Mechanical Design Engineer | Precision Electro-Mechanical Systems, Design for Manufacture
Weymouth, England | +44 7436 598751 | prashilrajshrestha@gmail.com | UK Skilled Worker Visa

PROFILE

Mechanical design engineer with five years on precision electro-mechanical products. Most of my work has been motion systems and optomechanics for Surface Mount Technology (SMT) equipment: linear motor stages, encoders, camera gantries, and the fixtures and build documentation needed to get them onto a production line. I take designs through to release under formal change control, so tolerance analysis, DFMEA, supplier drawing sign-off and ECR/ECO are part of the day job rather than someone else's. I machine, weld and print my own prototypes, which means manufacturing problems usually surface on my bench before they reach a supplier.

CORE SKILLS

- **CAD and PLM:** NX (daily driver), SolidWorks, Fusion 360. Teamcenter for BoM control, drawing release and ECR/ECO.
- **GD&T and tolerancing:** BS 8888 and ISO GPS. Datum scheme design, profile, position, runout. Worst-case and RSS stacks, Monte Carlo stacks written in Python. CMM inspection planning.
- **Analysis:** Linear static and modal FEA in NX Nastran and ANSYS. ABAQUS (crack propagation), ProCAST casting simulation, MATLAB and Simulink.
- **Quality and release:** DFMEA, control plans, FAI, root cause analysis, non-conformance resolution, production readiness reviews, build and test instruction packages.
- **Manufacturing:** CNC machining (I run a 3-axis mill on SolidCAM toolpaths), sheet metal, injection moulding, casting, FDM printing, MIG and TIG welding, surface finishes and coatings.
- **Software:** Python, NX Open journaling, Excel VBA, JavaScript and TypeScript. AWS S3 and DynamoDB.

EXPERIENCE

Mechanical Design Engineer | ASMP T SMT UK Limited, Weymouth

Apr 2023 – Present

Solder paste printing machines for semiconductor and electronics assembly. High duty cycle capital equipment working to micron-level accuracy.

- Owned the Vision Assembly Module from concept to prototype for Design to Cost, saving \$692: a linear motor stage, encoder, camera optics and kinematic mounts in one precision assembly. Wrote the build instruction pack covering torque schedule, motor air gap setting, encoder home bump-stop adjustment and ESD handling, and closed the open production readiness points before the line accepted it.
- Working on the gantry redesign for our current platform to support the end of life of the current camera and to add jetting functionality.
- Wrote a Python Monte Carlo tolerance model (50,000 runs) for a new platform gantry when the worst-case stack came out marginal. It put a real number on per-machine failure probability and justified a slotted-hole datum change instead of a sub-assembly redesign.
- Ran static and modal FEA on motion stage structure to confirm stiffness targets and check that no mode sat inside the operating frequency range.
- Built an EMA and modal analysis comparison tool that correlates experimental modal test results with FEA, using the Modal Assurance Criterion (MAC) for mode shapes and a natural frequency comparison.
- Requalified rare-earth magnets across the product range against Chinese export controls. On the under-screen cleaner pot magnet I set 5.5 kg pull force as the critical characteristic, confirmed it was not a high temperature application, moved it from SmCo to a catalogue NdFeB part, and had the supplier life test it before I released the change.
- Led DFMEA sessions for new module introductions and fed the failure modes and detection methods straight into the control plan.
- Designed and released jigs, fixtures and calibration tools for gantry, feeder and vision sub-assemblies, with poka-yoke features anywhere an operator could get it wrong.
- Reviewed supplier drawings on machined, sheet metal and injection moulded parts for GD&T compliance and tolerance realism. On one supplier I printed the part myself first, so the pushback on quality came with evidence attached.
- Worked on Sustaining, resolving real customer issues by finding and fixing the root cause of hardware problems on our production machines.

Engineering tooling I built alongside the design work

- AntIT (gdteditor.com), a browser-based PDF drawing review tool in React and TypeScript on AWS. It replaced our Acrobat licences and standardised how the team marks up drawings. It also scores a released NX drawing against our 84-point internal checklist automatically.
- NX drafting macros written in NX Open for CNC and 3D part drawing creation. Colleagues are testing them now and I am packaging them as a team plugin.
- An ECR BoM compare macro in Excel VBA that parses Teamcenter exports and produces a redline report. Reconciliation per change cycle dropped from around two hours to under fifteen minutes.
- A set of LLM engineering agents covering drawing checking, machine diagnostics and process guidance across our 13 machine modules. Presented at the company AI colloquium in Munich.

Contract Electro-Mechanical Design Engineer | Zyzze Ltd t/a BigSis, Reading

Jan 2023 – Mar 2023

- Three-month contract to deliver a working bio-control prototype. Designed a modular egg feeder around linear guides and a stepper motor, with Duet2D-controlled feed logic, inside a fixed mechanical envelope.
- Built and iterated the FDM printed and CNC machined prototypes myself, and handed over a functional firmware-integrated unit inside the contract window.

Mechanical Design Engineer | Real Time Solutions Pvt. Ltd., Nepal

Oct 2019 – Sep 2021

- Led mechanical design of sealed sensor enclosures, PCB housings and battery-powered field units for hydrological monitoring, packaged for waterproofing and thermal load in harsh outdoor service.
- Designed and structurally analysed a motorised cableway on tensioned guywires, with FEA to verify safety margins under load.
- Ran the in-house 3-axis CNC mill on SolidCAM toolpaths and managed prototype builds end to end, including casting and machining. Also co-built an electric tiller as an internal R&D project, doing the MIG and TIG welding on the chassis and integrating motor, transmission and tine assemblies.

Research Assistant | Design Lab, Kathmandu University, Nepal

Mar 2019 – Oct 2019

- Casting simulation of a 92 kW Francis turbine runner in ProCAST, covering thermal, solidification and porosity behaviour. Validated against photogrammetry of a 3D printed pattern and a lost-wax cast prototype, and published in AIP Conference Proceedings.
- Generative design optimisation of drone airframes in Fusion 360 for a medical supply drone project, with FDM prototypes for fit and handling checks.

EDUCATION

MSc Advanced Mechanical Engineering | Cranfield University, UK

2021 – 2022

- Thesis on textile-based wearable RF energy harvesting for medical devices. Group projects in crack propagation (ABAQUS) and CPV solar cell thermal-electrical modelling (Simulink).

BE Mechanical Engineering (Design and Manufacturing) | Kathmandu University, Nepal

2015 – 2019

- Thesis on casting simulation of the Francis turbine runner above, carried on into the Design Lab role. Workshop, machining and welding training formed part of the course.

PROFESSIONAL AND TRAINING

IMechE member, working towards IEng registration under UK-SPEC. Formal GD&T training to BS 8888 and ISO standards. Machinery Safety Fundamentals. Lean Six Sigma. Teamcenter PLM training. Python for Data Science and Aerial Robotics with MATLAB (Coursera).