

Uljan Sinani

Senior Mechatronics & Robotics Engineer | United Kingdom

uljan.sinani@gmail.com · 073-7977-8240 · linkedin.com/in/uljansinani · Full UK driving licence

Portfolio: **sinani.ai** — physics-based simulation, world-model latent audit, open engineering notebook ·
github.com/USinani

Professional Summary

Senior Mechatronics Engineer with 6+ years' experience designing, building, and deploying automated electro-mechanical systems — from closed-loop test rigs integrating motors, sensors, DAQ, and embedded controllers, to a field-deployed robotic coating-application system that turned a manual industrial process into a repeatable automated workflow. I work across the full stack of physical automation: mechanism and system design, device integration and I/O, control and scripting (Python, C++, ROS/ROS2), calibration and error handling in real operating environments, and validation through structured test campaigns to production-grade robustness. Currently completing a PhD in Biomedical Engineering / Collaborative Robotics (physics-based simulation of human movement — MATLAB, OpenSim, MuJoCo).

Core Competencies

Robotic system design, build & deployment · Device & instrument integration (motors, actuators, ToF/current/voltage sensing, DAQ, embedded controllers) · Python & C++ for device control & workflow automation · ROS/ROS2 · Closed-loop control, calibration & error handling · Translating manual processes into automated workflows · Physics-based simulation (MATLAB/Simulink, MuJoCo, OpenSim, Gazebo) · Motion planning, kinematics & PID control · Test-campaign data logging & analysis · Prototype-to-production

Professional Experience

AssetCool Ltd., Leeds, United Kingdom

May 2025 – June 2026

Senior Mechatronics Engineer (Mechanical Design Lead)

- Led the design, build, and deployment of the Dynamic Coating Application Module (DCAM) — a robotic system automating the application of protective coatings onto power-grid conductors, carried on base robotic platforms — taking it from proof-of-concept prototype to a robust, repeatable, field-deployed system.
- Translated a manual coating process into an automated workflow in close collaboration with chemists and fluidics specialists: capturing process requirements (delivery rate, uniformity, coverage), designing the actuation and fluid-delivery system to meet them, and building in the sensing and controls needed for repeatable, in-spec application.
- Integrated the module's devices end-to-end — actuators, motor drivers, ToF/current/voltage sensing, and embedded control — working with the electronics and software teams on I/O, device behaviour, calibration routines, and error handling for safe, reliable operation in a harsh outdoor environment; ran structured lab test campaigns across build iterations (3D-printed concept to CNC-machined production-intent), logging test and sensor data to verify performance against specification.
- Delivered international field commissioning and validation with Hydro-Québec, Canada (June 2025) — full uniform 360° coating across a 300m conductor span on a decommissioned line — including installation health & safety planning for site work on utility grid infrastructure.
- Coordinated a multidiscipline design effort across mechanical, electronics, software, chemistry, and fluidics teams; held the mechanical design accountable to functional requirements and client specification, managing design change between prototype and production-intent builds.

Federal-Mogul Powertrain / Tenneco, Essex

2023 – 2025

Mechatronics Design Engineer (Lead)

- Led a five-person team investigating and redesigning the power-electronics water cooling plate on the Belt Integrated Starter-Generator (AMG programme): hydraulic/thermal design, tolerance analysis, and FEA, delivered as a complete 3D model and 2D drawing package to BS 8888 with GD&T; coordinated the checking, approval, and validation handover (shaker and integration testing) against customer specification.
- Owned the mechanical design of the generator housing through a client-driven change programme (new connectors and mounting points for range expansion) — implementing design change control and reporting progress directly to the end customer alongside internal stakeholders.
- Built an electromagnetic/thermal simulation of the switched reluctance motor in Motor-CAD to characterise flux and heat dissipation; used the temperature-gradient insight to define optimal thermistor placement and advise the power-electronics team on power modulation and conductor/harness routing to minimise EMI.
- Designed, prototyped, and validated a precision thermistor clamp for repeatable sensor placement within the stator bore, carrying the design from lab verification through to final customer approval at the Munich production site.

- Delivered technical drawings to relevant ISO and BS standards for the housing, cooling plate, and rotor; reviewed and approved design work from junior engineers and mentored the team on analysis methods, CAD standards, and documentation practice.

Borg Automotive UK Ltd., West Midlands

2019 – 2020

Mechanical Design Engineer

- Designed bespoke electro-mechanical test fixtures and automated validation systems for electric power-steering assemblies — closed-loop test rigs integrating motors, sensors, DAQ, and embedded controllers; conducted stress, thermal, and dynamic FEA to verify sub-assembly robustness under operational loads.
- Standardised CAD modelling conventions and 2D drawing standards across the design office; conducted design reviews to improve documentation quality, consistency, and checking efficiency.

Car Parts Industries (CPI), Belgium

2018 – 2019

Mechatronics Engineer – R&D

- R&D and New Product Introduction for electric steering columns (VW, FIAT, Opel/Vauxhall); on the Prometheus project, developed an embedded module interfacing with the CAN communication between steering units and the vehicle ECU — hands-on work with automotive connectors, harnessing, and electrical interconnects.

BORG Automotive A/S, Denmark

2016 – 2017

Junior Mechatronics Engineer

- New Product Introduction for electric and mechanical steering racks; authored test-rig specifications, developed jigs and diagnostic test equipment, and fed structured issue reports back to the remanufacturing team.

Doctoral Research

University of Reading — PhD, Biomedical Engineering / Collaborative Robotics (distance, part-time)

Nov 2021 – Present

Physics-based biomechanical simulation of human upper-limb motion

- Developing two- and three-link rigid-body dynamic models of the human arm in MATLAB with anthropometric parameterisation; integrating Hill-type muscle actuators (OpenSim) and building 3D visualisation pipelines in MuJoCo and Unity — applying structured modelling, simulation, and performance-evaluation methods to complex mechanical system behaviour.

Education

Tallinn University of Technology — MSc, Mechatronics Engineering

2014 – 2016

Exchange, University of Southern Denmark — Mechatronics for Nanotechnology

Polytechnic University of Tirana — BSc, Mechatronics Engineering

2012 – 2014

Technical Skills

Robotics & Controls: Forward/inverse kinematics & dynamics, motion planning, trajectory generation, PID control, closed-loop systems, calibration & error handling

Software & Scripting: Python (NumPy), C++, MATLAB, ROS/ROS2, Git, real-time systems, data analysis, applied machine learning

Simulation & Modelling: MATLAB/Simulink, Robotics System Toolbox, MuJoCo, OpenSim, Gazebo, Unity, FEA, Motor-CAD (electromagnetic/thermal)

Device Integration & Electronics: Sensors and DAQ, ToF/current/voltage sensing, BLDC/FOC motor control, motor drivers, embedded controllers, CAN protocol work, signal conditioning, safety circuits, PCB collaboration

Mechanical & Prototyping: SolidWorks, Onshape, Fusion 360 (all Advanced); DFMA, tolerance analysis, precision mechanisms, rapid prototyping (3D printing, CNC, WaterJet)

Data & Test: Test-campaign design and execution, instrumented data logging, performance characterisation and validation against specification

Collaboration: Cross-disciplinary work with scientists (chemistry, fluidics), electronics, software, and customer stakeholders; junior engineer mentoring; global/matrix teams

Courses & Interests

Udacity Robotics Software Engineer Nanodegree | Industrial Automation | Leadership in Engineering

Open-source robotics, embedded systems projects, hardware prototyping, applied AI for physical systems, mentoring engineers.