

DEV KANANI

Senior Mechanical Design Engineer |Electromechanical Systems| Product Design Engineer

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PROFILE SUMMARY

Results-Driven **Design Engineer with 7+ years' experience** developing complex systems across high-tech sectors of aerospace, automotive, and energy. Proven expertise in leading end-to-end full **NPD lifecycle** from concept, feasibility through to detailed design, prototyping, and test validation. Expert in **CAD** (SolidWorks, Creo) and **CAE** tools (Ansys FEA/CFD) with strong capability in **verification, validation, and hands-on prototyping**. Adept in delivering production-ready components and assemblies engineered to withstand thermal extremes, complex fluid dynamics, and structural loads with **full compliance** to industry and **regulatory standards**. Known for driving design improvements, solving root-cause issues, and collaborating across disciplines to launch reliable, **cost-effective solution** on time.

PROFESSIONAL EXPERIENCE

Mechanical Design Engineer

Bowman Power Group 05/2023 - 08/2025 Southampton, United Kingdom

Lead Product Engineer (Interim): R&D corporation for turbocharger & genset OEMs of Aerospace, Rail & Automotive sector

- Directed complete **NPD cycle** leading end to end development of an electric turbocharger from feasibility to production, enforcing **DFMEA** to cut high-severity **RPN risks** by 30% and ensure compliance with stringent industry quality standards.
- Coordinated PDM-controlled releases and MRP - CAD **BOMs**, securing full standards CE compliance test readiness for electromechanical assemblies.
- Delivered **thermal validation** on turbocharger components, achieving results within **±10°C of predictions**, ensuring EMC compliance and partial discharge components.
- Reduced late-stage changes through management of cross-functional design reviews across UK & US teams, shortening **gate time by one month**.
- Modeled turbocharger alternator electromagnetic stack for **100–150 kW** systems in Motor CAD and ANSYS Maxwell, ensuring specification fit.
- Led design review for **Genset-compliant turbocharger**, validating power transmission for 20MW units and managing assembly and manufacturing processes.

Mechanical Design Engineer

- Engineered a carbon fibre rotor wrap for **40-100K rpm, validated by Ansys FEA**, achieving industry-leading rotor flux density.
- Developed high-voltage alternator cable housing in **SolidWorks** with PPS-PEEK (40% GF), validating thermal limits **below 125°C** and UL/TUV compliance, mitigating warranty risk by providing fatigue endurance evidence.
- Optimised turbocharger electromagnetic stack, enhancing iterations and accelerating prototype validation, **cutting 20% simulation time**.
- Implemented DFMEA and FEA/CFD methodologies, cutting late-stage integration errors by 25% and reducing prototype **validation time by one month**.
- Executed rotor-cartridge service interfaces with 3-ton press/puller tooling design, **validated ISO 1940 G2.5 balance**, standardising procedures to cut downtime by 10%.

Senior Design and Manufacture Engineer

Patel Industries Ltd. 04/2022 - 01/2023 Rajkot, India

- Lead a **team of five** engineers to design and assemble an 11-spindle granite edge-polishing system, completing on time and within budget
- Validated coolant and containment flow using **CFD (ANSYS Fluent)**, optimising enclosure seals and IP protection for moving axes, mitigating ingress risk and extending motor/electronics lifespan
- Programmed motion control in slab-cutting systems using **Allen-Bradley PLC**, cutting setup time by 50% and enhancing safety
- Engineered a high-speed die-punch system for candy molding, achieving 5,000 units per hour at 0.5-second cycle times
- Reduced defect rate to 0.05% in syrup-to-straw joining process, boosting yield by 500 units through process improvement
- Consolidated fixture redesign and accelerated PPAP by running **CAM collision/clearance simulations**, revising datum schemes, and adding relief features to respect real tool/fixture constraints

EDUCATION

Master of Science in Mechanical Engineering

Columbia University

New York, United States

Bachelor of Science in Mechanical Engineering

Columbia University

New York, United States

• Specialisation: Robotics & Thermodynamics

Bachelor of Science in Physics

Beloit College

Beloit, United States

• Minor in Mathematics

KEY ACHIEVEMENTS

Turbocharger Design Optimisation

Directed turbocharger development with FEA and CFD verification, reducing design errors by 25% post prototype validation

New Product Development Leadership

Directed full NPD cycle of electric turbocharger, cutting high-severity DFMEA RPN risks by 30% and achieving production readiness.

Technical Compliance & Commercial Delivery

Directed Critical Design Review converting 400+ requirements into compliance matrix, unlocking £300k earlier revenue through parallel workstream alignment

SKILLS

CAD Proficiency

SolidWorks ▪ Solid Edge ▪ Siemens NX ▪ CATIA V5 ▪ AutoCAD ▪ Fusion360 ▪ CREO

FEA, CFD, CAE Simulations

ANSYS Mechanical, Fluent, Maxwell, Motor CAD ▪ Autodesk Inventor ▪ Abaqus ▪ MATLAB ▪ Simulink ▪ Altium PCB design ▪ Altair Inspire ▪ nTop

GD&T (ASME Y14.5/ISO 1101 standards) ▪ BS 8888 ▪ Tolerance stack-ups & DVA ▪ ISO 9001 ▪ AS9100 ▪ P&IDs ▪ CAD & MRP BOMs ▪ system interfaces ▪ Technical drawings sign-offs ▪ CMM check

Programming Languages and Platform Software

Java ▪ C/C++ ▪ Python ▪ Arduino IDE ▪ Raspberry Pi ▪ STM32

CAD Design Engineer

Ferry Machine

📅 01/2021 - 04/2022 📍 New Jersey, USA

OEM for Lockheed Martin and J&J medical retractors

- Redesigned fixtures to modular plates, standardizing offsets and tool libraries. Reduced CNC setup time by 30%. Enhanced equipment effectiveness and throughput during frequent SKU swaps.
- Designed and standardised **SolidWorks model-based definitions**, configurations, and drawing templates, unclogging the design-to-sample pipeline and ramping up end-to-end workflows such as BOM, routings, setup sheets, and ECNs, eliminating line stops.
- Delivered a **Design for Manufacturing (DFM)** framework on team-designed parts and assemblies, resolving manufacturability issues early and preventing rework that would have added 15% to project costs.
- Conducted advanced testing and analysis of engine assembly components, resolving design challenges that reduced defect-related warranty claims by 10% and boosted client satisfaction ratings by 5 basis points.

Researcher

Columbia University

📅 05/2019 - 12/2020 📍 New York, United States

Dr. Sahin Laboratory – Extreme Biophysics, Creative Machines Lab

- Developed a 0.85m³ unit generating 1.26W from humidity using cellophane's cycle, showing renewable potential. Validated in **SolidWorks & Simulink**.
- Investigated rotary evaporation engines, building models in SolidWorks and **3D printing** SLA/SLS parts; collected performance data to de-risk deployment and solution integration, delivering 50.23 mN·m torque on a 10-wheel assembly for additive manufacturing.
- Developed cost-efficient structure fabricated from Carbon fibre, modeled in **Altair** (for FEA) and **nTop**, by **precise CNC** milling and laser cutting for the final product testing that gave approximately 1W of power from evaporation.
- Developed an optimal **PCB design** for AD9280, achieving 32 MSPS throughput, enabling high-speed live data capture.
- Integrated **Raspberry Pi** and STM32 platforms for seamless synchronization and stable real-time transmission feed for motion control.
- Engineered **2D sonogram handheld** device for image rendering through live data pipeline, delivering clear, accurate image visualization on mobile device.

Research Assistant

- Led embedded-systems R&D for a handheld ultrasound device around **STM32** and a custom **Arduino IDE** with AD9280 chip, achieving 32MSPS real-time streaming and clear 2D imaging, demonstrating sensors, control systems, and electro-mechanical systems capability.
- Built an evolutionary-algorithm physics simulator in Java and C++ to evolve robot morphology and gait, optimizing a locomotion fitness function and advancing motion control capability.
- Designed and manufactured a two-way cam-follower valve regulating a two-stroke pneumatic engine at 95 psi, evidencing practical pneumatics, actuators, and mechatronics in a compact system.

Junior Engineer - Power System Engineer

Fairbanks Morse Engine, Enpro Industries

📅 05/2017 - 08/2018 📍 Beloit, United States

- Standardised factory documentation for drawings, BOMs, and CAD inclusions, embedding adaptable quality control processes across engineering.
- Collaborated with quality engineers on **ISO-aligned** compliance, executing audits and corrective actions to ensure 100% adherence to safety standards.
- Applied **statistical time-motion study** at crankshaft station, implementing process changes that cut installation time by 40 seconds per engine.
- Contributed to diesel engine chassis design in **Siemens NX**, optimizing motion control parts to reduce fuel consumption by 5%.

Compliance & Standards

UKCA/CE • REACH/RoHS • UL/TUV certifications • EMC/EMI compliance • H&S • Requirements (FDS) and compliance matrix

Systems engineering

V&V testing • ECR/ECN • RCA • 8D/5W • Lean Six Sigma principles • SOP reports and specification • acceptance criteria • RSD tracing • Concept-to-production ownership; Stage-Gate delivery; ECN/ECR governance

Materials & Manufacturing

Metal Alloys; Carbon composites; Additive Printing • Injection moulding • CNC • sheet metal • Rigs and fixtures • duty cycle time reduction

Thermal & Fluids

conjugate heat transfer & cooling system design • pressure-drop • hydraulic & pneumatic mechanism • HVAC • thermodynamics transient simulations,

Analytical Calculations

simulation correlation • stiffness • fatigue • correlation to test • sensitivity • mesh convergence

Robotics design

kinematics, actuators, motion planning, and machine vision integration • Sensor integration;

CERTIFICATION

FE certification (EIT), Member of ASME - USA

IEng UK Equivalent

UNIQUE EXPERTISE

Mechanical Design Engineering

Manufacturing Engineering

Robotics Engineering

Automation

Leadership and Management

Team collaboration

On-Time Delivery