AKSH RAJPUT

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SUMMARY

Mechanical Design Engineer with strong experience designing, analyzing, and validating complex mechanical and electromechanical systems for industrial applications. Proven ability to take designs from requirements and CAD through analysis, prototyping, testing, and manufacturing support, with a focus on precision assemblies, tolerance-driven design, and manufacturability.

EDUCATION

Master of Science in Mechanical Engineering — Blacksburg, VA

Virginia Tech ***(GPA – 3.86/4)*** — *Aug 2023 – Jun 2025*

Thesis: Accurate On-body distance estimation using BLE RSSI and IMU sensor fusion.

Relevant Coursework: Design of Machine Elements, Solid Mechanics, Mechanical Equipment Design, Applied Linear Systems and Control, Optimization Techniques, Industrial Automation, Machine Learning, Linear Algebra

WORK EXPERIENCE

Headwaters Solutions LLC — Ithaca, NY

Mechanical Engineer I — *Jun 2025 – Present*

- Designed **30+ complex 3D CAD models** of heat exchangers, vessels, and PSA plant assemblies using SolidWorks, applying GD&T and tolerance analysis for production-ready drawings.
- Owned pipe & tube routing layouts for PSA hydrogen systems, **reducing material usage by ~12%** through geometry optimization.
- Supported manufacturing, assembly, and installation by resolving fit-up, tolerance stack, and interference issues identified during build and early testing.
- Developed **electromechanical integration drawings (loop diagrams, P&IDs)** for 100+ sensors, actuators, and control units, cutting cross-team integration time and reducing wiring ambiguities during commissioning.

Assistive Robotics Laboratory, Virginia Tech — Blacksburg, VA

Graduate Research Assistant — *Feb 2024 – June 2025*

- Designed, prototyped, and integrated **wearable BLE + IMU (ESP32 + BNO08x)** embedded modules into a compact on-body device, using Creo and iterating with rapid prototyping to achieve improved mounting rigidity and **reducing orientation-induced noise by 15%,** improving BLE-IMU localization stability.
- Conducted structured experimental validation (50k+ datapoints), applying **repeatability analysis and data-driven evaluation** to verify design performance against requirements.
- Authored firmware and test procedures to ensure **synchronized data acquisition and consistent validation results**, improving experimental robustness.

TMEIC Corporation Americas — Roanoke, VA

Intern — *Aug 2024 – Dec 2024*

- Supported automation system development by benchmarking PLC communication performance and documenting impacts on system reliability and deployment.
- Converted legacy steel mill schematics to modern CAD-based formats, enabling smoother automation integration.

Mercedes-Benz Research and Development India — Bangalore, IN

Student Trainee — *Aug 2022 – Jan 2023*

- Developed Python automation scripts and custom Tkinter GUIs to streamline CAE pre-processing workflows, reducing setup time and manual input errors, and achieving a **90% improvement in processing efficiency**.
- Simulated mechanical load cases for Cargo vehicle designs, analyzing deflection and bending moment data to inform structural recommendations and support data-driven engineering decisions for chassis improvement.

PROJECTS

Suspensions Lead, SAE BAJA Team, BITS Pilani | *Solidworks, Ansys, Manufacturing* — *Aug 2020 – Jun 2022*

- Led end-to-end mechanical design of a full vehicle suspension system from concept through fabrication, performing **hand calculations, tolerance stack-ups, and FEA (stress, fatigue, impact)** to validate structural performance.
- Designed machined and welded components, coordinating **manufacturing processes, fixturing, and assembly sequencing** to ensure dimensional accuracy and durability.

TECHNICAL SKILLS

CAD & Mechanical: SolidWorks, AutoCAD 2D, Siemens NX, GD&T, FEA (Ansys Mechanical), DFM principles.
Electronics & Robotics: Arduino, ESP32, IMUs (BNO08x), ROS, sensor integration, test fixture development.
Programming & Tools: Python (Numpy, Pandas, Matplotlib), MATLAB, 3D printing, CNC machining, PLC, C++.