

Gaurav Joshi

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OBJECTIVE

Graduate student in Aeronautics & Astronautics at the University of Washington seeking election as GPSS Vice President of Finance for 2025–2026. Skilled in budget management, financial analysis, and cross-functional collaboration with experience supporting strategic decision-making and advocating for student needs through data-driven initiatives.

EDUCATION

University of Washington
Master of Science – Aeronautics & Astronautics; GPA: 3.55/4
Relevant Coursework: Mechanics of Solids, Finite Element Analysis, Nanocomposite Materials, Dynamical Systems, Vector Calculus & Complex Variables, Tensor Calculus, Computational Design & Fabrication.
Experience: Graduate Student Grader, Executive Senator – Student Senate

Seattle, WA
Sep 2024 – Aug 2026

Sant Longowal Institute of Engineering & Technology
Bachelor of Engineering - Mechanical Engineering; GPA: 9.26/10 (Honors GPA: 9.85/10)
Relevant Coursework: Machine Design, Heat & Mass Transfer, Control Systems, Kinematics of Machines, Numerical & Statistical Methods, Advanced Welding Processes, Fluid Mechanics & Machinery, Applied Thermodynamics, Manufacturing Processes.
Experience: Team Lead – BAJA SAE, Career Development Chair – Student Council, Event Chair – Alumni Relations

Punjab, India
Jul 2018 - Jun 2022

WORK EXPERIENCE

Mahindra & Mahindra Ltd.
New Product Development Engineer

Aug 2023 – Mar 2024
Chandigarh, India

- Led cross-functional teams (R&D, manufacturing, and supply chain) to develop and launch next-generation tractor, leveraging Siemens NX, CATIA, and ANSYS for design optimization and structural analysis, reducing prototype-to-production timelines by 20% while ensuring compliance with ISO/TS 16949 quality standards.
- Optimized drivetrain component production by applying DFM, DFA, and Lean Six Sigma methodologies, integrating finite element analysis (FEA), computational fluid dynamics (CFD), and predictive analytics to enhance structural integrity, thermal efficiency, and manufacturability, resulting in a 15% reduction in manufacturing costs and a 25% improvement in assembly efficiency.

Mahindra & Mahindra Ltd.
Graduate Engineering Trainee

Aug 2022 – Aug 2023
Chandigarh, India

- Enhanced metal casting efficiency and yield by leveraging FLOW-3D Cast simulations to predict solidification defects, flow turbulence, and pouring inconsistencies, implementing data-driven process optimizations that reduced scrap by 14 tons, increased yield by 16%, and improved first-pass quality, minimizing rework costs.
- Developed and deployed a real-time production tracking system for molten metal pouring of ASTM Grade 25 components, integrating camera-based thermal monitoring, IoT sensors, and Excel-driven data acquisition, enhancing process control, defect detection, and operational efficiency.

Vehicle Research & Development Establishment (VRDE)
Mechanical Design Engineer Intern

Feb 2023 – June 2023
Maharashtra, India

- Leveraged SolidWorks for 3D CAD modeling and Design Engineering to optimize a compact heat exchanger using MATLAB-based parametric analysis and STAR-CCM+ CFD simulations with porous media modeling, improving thermal efficiency, space utilization, and system reliability.
- Validated transient thermal behavior through rigorous testing processes using analytical and numerical analysis in MATLAB, achieving ~90% correlation with real-world combat vehicle test data, ensuring performance reliability under degraded conditions.

ACADEMIC EXPERIENCES

Graduate Researcher in Charlie Dorn’s Lab, Aero & Astro, UW

Mar 2025 – Present

- Conducting research on phononic materials and periodic structures to analyze wave propagation and bandgap behavior using numerical simulations and dynamic modeling techniques.

Graduate Researcher in Programmable Matter Lab, Aero & Astro, UW

Sep 2024 – Dec 2024

- Developed a parametric design representation for a Prusa MK3 camera mount using Fusion 360, ensuring adaptability.
- Leveraged parametric constraints and design space optimization to enhance manufacturability and stability, while integrating the solution into an AI-driven process monitoring framework for improved 3D printing performance.

Undergraduate Researcher in Welding Metallurgy Lab, SLIET

Mar 2021 – Feb 2022

- Optimized additive manufacturing and fabrication processes for AISI 316L steel using Cold Metal Transfer (CMT) and Wire Arc Additive Manufacturing (WAAM), refining deposition parameters (travel speed, current) in Simufact Welding to improve dimensional accuracy by 20% and reduce material waste by 15%.
- Enhanced corrosion resistance of additively manufactured AISI 316L steel by integrating Inconel 625 interlayers, improving fatigue performance under cyclic loading.
- Conducted electrochemical corrosion testing using Cyclic Potentiodynamic Polarization (CPP), Electrochemical Impedance Spectroscopy (EIS), and Double-Loop Electrochemical Potentiodynamic Reactivation (DLEPR) (Gamry Potentiostat), achieving a 25% increase in pitting corrosion resistance through tailored solution annealing heat treatment.
- Developed and tested multi-material weld matrices, fabricating AISI 316L-Inconel 625 interlayers via WAAM and analyzing mechanical durability through Fatigue Crack Growth Rate (FCGR) testing (ASTM E647).
- Implemented robotic additive manufacturing workflows using a Kawasaki BN600 robotic arm, improving process automation and repeatability in large-scale metal deposition applications.

- Designed and optimized an H-arm suspension system with camber link for an all-terrain vehicle (ATV), utilizing MSC Adams, MATLAB, and ANSYS to enhance handling, impact absorption, and ride comfort, achieving a 20% reduction in sprung mass.
- Optimized the CVT system using MATLAB, Simulink, and Powertrain Blockset to improve power transfer efficiency, validating refined parameters through real-world testing with a CvTech LP3 CVT and Briggs & Stratton engine for enhanced performance and drivability.
- Led a team of 18 engineers in the design, analysis, and fabrication of a tubular chassis and structural components, conducting FEA-based stress, impact, and fatigue analysis to ensure durability under extreme off-road conditions.
- Applied Technology Readiness Level (TRL) methodology, taking suspension and chassis design from TRL 3 (concept validation) to TRL 6 (prototype testing) through iterative simulations, optimization, and field testing.
- Conducted Design Failure Mode and Effects Analysis (DFMEA) and executed Design Verification Plan and Report (DVP&R) for suspension and structural components, mitigating critical failure risks and ensuring compliance with safety, durability, and performance benchmarks.

PROJECTS

- **Forward Kinematics of Robotic Arm:** Modeled and analyzed the forward kinematics of a 2R robotic arm using Python and the Denavit-Hartenberg Transformation method, ensuring precise joint position estimation and workspace optimization for robotic motion planning.
- **Genetic Algorithm for Function Optimization:** Developed and executed advanced genetic algorithms to optimize functions using MATLAB, achieving a significant 30% reduction in processing time while integrating real-time plotting for enhanced visualization of experimental parameter changes.
- **PID Control System Design for Autonomous Vehicle Navigation:** Developed PID control strategies for autonomous vehicle path tracking, integrating Pure Pursuit, Stanley Method, and Kinematic/Dynamic Models. Simulated controller performance in CARLA under varied road conditions, optimizing trajectory accuracy and stability for real-time navigation.

RESEARCH PUBLICATION

Gaurav Joshi, A.S. Shahi, Prediction of angular distortion in austenitic stainless steel welds using finite element analysis, Materials Today: Proceedings, Volume 62, Part 14, 2022, Pages 7517-7522, ISSN 2214-7853 [Link](#)

OTHER

Technical Skills: MATLAB, Simulink, Abaqus, Ansys, STAR-CCM+, FLOW-3D Cast, MSC Adams, Python, C++, Siemens PLM Teamcenter, Solidworks, Autodesk Fusion, DFMA, Lean Six Sigma, FMEA, GTAW Welding, Machining (Lathe, Milling, Drilling), Lab Testing & Instrumentation, Microsoft Office Suite: Excel, PowerPoint, Project.

Honors & Awards:

- *Finalist* – STS 2025, Autonomous Drone Fleet for Campus Safety, University of Washington (*Jan 2025*)
- *Best Performer* – Operational Excellence for Young Engineers, Mahindra & Mahindra (*Jan 2024*)
- *Contributory Talk* – Conference Advancement & Futuristic Trends in Mechanical & Materials Engineering, (*Dec 2021*)
- *Finalist* – AIT 5-Minute Research Pitching, Asian Institute of Technology, Thailand (*Oct 2021*)