Rutej Talati

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EDUCATION

Pennsylvania State University, University Park, PA (Graduation: December 2025) **ME GPA: 3.5**
Bachelor of Science in Mechanical Engineering, Minor: Physics.
Dean's List: Summer 2023, **Summer 2024.**

EXPERIENCE

Automotive Consultant (April 2025 – September 2025)
PwC Southeast Asia – Mumbai, India
- Conducted technical benchmarking of Caterpillar, Kubota, and Tata-Hitachi platforms by analyzing powertrain layouts, hydraulic flow behavior, efficiency curves, and drivetrain load paths, identifying 8 improvement areas.
- Built SDV-level technical mapping models for two OEM platforms, assessing E/E architecture, connectivity layers, software structure, in-vehicle compute distribution, and deployment pathways for localized system integration.
- Analyzed semiconductor options across **20 Tier-1 suppliers** by comparing compute capability, memory architecture, thermal envelopes, and ECU integration feasibility for next-gen infotainment and control systems.

Technical Strategy Intern (April 2025 – May 2025)
AIQ Space – Mumbai, India
- Evaluated drone platforms by comparing sensor suites, payload interfaces, flight-control software, telemetry rates, and compute requirements across startup systems.
- Assessed **12 drone-tech startups at IIT**, recommending top candidates for GIS mapping investment in India.
- Built Excel-based scoring models using pivot tables, feature matrices, and weighted metrics to identify high-performance candidates for GIS and mapping applications.

PROJECTS

Research on the Aerodynamics in Formula 1 (January 2023 – March 2023)
- Modeled F1 bodywork and aero surfaces in **SolidWorks** for flow analysis.
- Ran CFD studies capturing boundary-layer behavior, flow separation, and pressure gradients, achieving **<4% drag error**.
- Analyzed vortex structures, wake formation, and cooling-duct airflow to assess stability and efficiency.
- Designed wing diffuser updates yielding a **7% increase in predicted downforce** at similar drag.
- Analyzed 2026-regulation wake structures, focusing on vortex decay, turbulence intensity, and laminar-flow preservation for improved trailing-car stability.

Energy-Efficient Mining Truck Challenge – Wabtec Corporation (August 2023 – December 2023)
- Modeled tire and suspension components in SolidWorks to quantify deformation cycles across varying loads and terrains.
- Designed a piezoelectric energy-harvesting system and simulated strain-to-power output relationships in MATLAB/Simulink.
- Developed a Simulink-based control strategy for power conditioning and storage optimization.
- Achieved a projected **18%** improvement in fuel efficiency through deformation mapping, and piezoelectric placement.

Drive Axle Load Analysis – Dana Inc. / Shanghai Jiao Tong University (China) (January 2025 – April 2025)
- Modeled axle geometry in **SolidWorks** and performed static and dynamic FEA in **ANSYS** for stress evaluation.
- Used **MSC ADAMS** to simulate drivetrain duty cycles and generate realistic time-varying load profiles.
- Optimized geometry to **reduce stress concentration by 6%,** improving structural reliability and efficiency.
- Correlated ADAMS load cases with ANSYS fatigue results to create a load-to-life prediction workflow, improving accuracy of durability and NVH assessments.

Software Defined Vehicle Architecture Research, PwC White Paper (June 2025 – July 2025)
- Benchmarked OEM systems across E/E architecture, in-vehicle networking and semiconductor performance.
- Analyzed SoC chipsets and memory hierarchies, to assess vertical integration of infotainment and compute platforms.
- Processed supplier datasets using **Excel (XLOOKUP) and Python** to clean data and automate performance comparisons.
- Mapped compute loads, bandwidth requirements, and hardware–software dependencies to ECU zone architecture readiness, supported by radar charts and heat-map dashboards.

CAMPUS INVOLVEMENT

Teaching Assistant, Mechanical Engineering **(**Thermodynamics**)** (May 2024 – May 2025)
Pennsylvania State University, University Park, PA.

Grader, Mechanical Engineering (Engineering Math**)** (January 2024 – Present)
Pennsylvania State University, University Park, PA

SOFTWARE PROFICIENCY

MATLAB **SOLIDWORKS** **AutoCAD** Arduino **Excel**
MSC ADAMS **CATIA V5** ANSYS Fusion 360 Python

LEADERSHIP AND INVOLVEMENT

Autonomous Vehicle Team, **Safety Technologies Lead** **(**August 2022- May 2025)
Nittany Motorsports Formula SAE Team, **Chassis Lead** **(**August 2022 – March 2023)
Wind Energy Club, **Member** **(**January 2023 – Present)
Society of Penn State Mechanical Engineers, **Member** **(**August 2022 – Present)