Abhinav Bhanupratap Singh

abhinavsingh1176@gmail.com +1(765)-543-5317 abhinav-bhanupratap-singh
Mechanical Engineering Student | CAD | Simulation | Thermal-Fluid Systems | Spring 2026 Co-op Applicant

Summary

Sophomore Mechanical Engineering student with hands-on experience in CAD, simulation, and fabrication with a strong foundation in collaboration, documentation, and leadership. Excited to contribute in fast-paced engineering teams.

Education

B.S. Mechanical Engineering West Lafayette, IN
Purdue University *December 2027*

- Dean's List & Semester Honors.
- Cumulative GPA: 3.88

Experience

Cooling Technologies Research Center, Purdue University West Lafayette, IN
Undergraduate Researcher *April 2025 - Present*

- Performed end-to-end simulation pipeline in ANSYS Fluent — geometry creation, meshing, case setup, and post-processing — to analyze heat transfer and pressure drop across pin-fin heatsink geometries.
- Simulated multiple pin-fin orientations using varied modeling methods (2D vs 3D, symmetry, fine resolution) to evaluate thermal performance, pressure loss, and accuracy-speed trade-offs. *(12 hrs/week)*

Department of Mechanical Engineering, Maharaja Sayajirao University, Vadodara Gujarat, India
ME Research Intern *July 2023 - August 2023*

- Conducted full-time research on parabolic solar concentrators and thermocouple-based heat flux sensors; drafted thesis manuscript and performed comparative thermal analysis to evaluate sensor and system performance.
- Led data acquisition and experimental validation to assess thermal conductivity, sensor sensitivity, and solar concentrator efficiency using graph-based visualization techniques.
- Gained exposure to academic research methodology, patent drafting, and intellectual property strategy through literature reviews and collaboration with faculty and grad researchers.

Projects

American Society of Mechanical Engineers Racing Purdue University
Powertrains Team Member *January 2025 - Present*

- Designed Purdue's first in-house CVT mount using Autodesk Fusion in coordination with chassis and engine sub teams, performing weight and cost calculations to optimize packaging and transmission efficiency; fabricated a custom metal shroud using bandsaw, brake, and drill press to reduce heat exposure and protect drivetrain components.
- Engineered a repositionable exhaust mount to correct misalignment issues - enabling a secure fit for the muffler while improving exhaust stability and integration with the kart's frame; Performed countermeasure analysis to address poor contact and fitment issues with original mounting structure.

Electric Vehicle Event Infrastructure, Eng. Projects In Community Service Purdue University
Project Archivist, Kart Manual Team *January 2025 - May 2025*

- Developed a beginner-friendly kart assembly manual for the MSTEM3 EV Kart for high school students, used at the Purdue EV Grand Prix; Managed design and transition documentation for the EV Kart Manual team, coordinating midterm and final deliverables.
- Collaborated with Director of Purdue Motorsports and TopKart USA to build instructional templates for chassis, rear axle, and brake module assembly.
- Created and integrated CAD visuals using SolidWorks to support hands-on learning. Incorporated student feedback to refine documentation and reduce kart assembly time for high school teams.

Global Air Quality Trekkers, Eng. Projects In Community Service Purdue University
Electronics Team Member *August 2024 - December 2024*

- Designed a compact, cost-efficient air purification system with Arduino-based VOC/CO_2 sensor integration; reorganized circuit layout and programmed real-time data acquisition for classroom deployment.
- Built and tested circuits via breadboarding, integrating sensor modules with an Arduino Uno for real-time air quality monitoring.
- Contributed to design documentation and supported a successful Stage 2 grant application for further development.

Skills

Siemens NX, Autodesk Fusion, SolidWorks, CATIA V5, GD&T, Drafting | ANSYS Fluent, ANSYS Mechanical | Python, MATLAB, Arduino | CNC, Woodworking tools, Soldering, Welding | Excel, GitHub, LaTeX