David Vasilev

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Education

Purdue University - West Lafayette Expected Class of 2027

B.S. Aeronautical and Astronautical Engineering *Deans List | 3.66/4.00*

- Purdue Solar Racing Team: Chief Engineer

Relevant Coursework:

- Aeromechanics, Structural Analysis, Thermodynamics, Fluid Mechanics, Dynamics and Vibrations, Signals Analysis, Physics Mechanics, Physics Electricity and Magnetism, Object-Oriented Programming, Data Structures

Experience

Purdue Solar Racing Club | Chief Engineer West Lafayette, IN

American Solar Challenge, Formula Sun Grand Prix *Aug. 2024 – Present*

- Led 200+ member team in top-down subsystem integration for 2026 competition, coordinating schedules, cross-team workflows, and weekly deliverables while dedicating 40+ hours/week.
- Solved complex packaging challenges by designing chassis layouts under tight spatial constraints; optimized component placement and orientation for cooling, wire efficiency, and structural integration.
- Developed pre-preg carbon fiber monocoque chassis and composite layup molds, guiding weight reduction and load optimization while ensuring compliance with system and safety regulations.

Purdue Aerial Robotics Team | Avionics and Optics Team Member West Lafayette, IN

Student Unmanned Aerial Systems Competition *Aug. 2024 – Aug. 2025*

- Derived electrical and optical component requirements to meet system specifications for the 2025 competition.
- Performed Finite Element Analysis of mounts under crash load conditions using Siemens Simcenter.
- Conducted thermal and electrical load analysis on batteries and processing components.
- Designed avionics installation and defined wiring harness specifications, performing dynamic analysis to optimize RF cable lengths, antenna separation, and signal transmission.

Popmintchev Labs | Research Assistant San Diego, CA

Center for Advanced Nanoscience - University of California San Diego *Apr. 2023 – Apr. 2025*

- Researched conservation of orbital angular momentum through anti-resonant waveguides for generation of coherent X-rays with applications in bio/nano-imaging and semiconductor manufacturing.
- Designed, assembled, and tested various optical and vacuum experimental setups using SolidWorks and MATLAB.
- Collaborated with international manufacturers and scientists, including Nobel Laureate Donna Strickland.
- Led 20+ high school, undergraduate, and graduate students in laboratory research in absence of Dr. Popmintchev.

Projects

Solar Car - Artemis | *Top-Down Modeling, System Integration* *Aug. 2024 – Present*

- Applied top-down modeling and wavelinking in Siemens NX to enable in-place design and full-system integration across mechanical, electrical, and structural assemblies.
- Resolved integration challenges by aligning electrical systems and mechanical assemblies with chassis geometry, optimizing spatial layout, serviceability, and mechanical compatibility across subsystems.
- Managed and validated CAD data integrity and concurrent workflows via PDM, while defining structural interfaces (hinges, aeroshell supports, cross-members) for rigidity and aerodynamic fit.

Monocoque Chassis | *Composites, CAD, Finite Element Analysis* *Aug. 2024 – Present*

- Designed a pre-preg carbon fiber monocoque chassis as the vehicle's central load-bearing structure, integrating suspension, electronics, and driver systems into a unified geometry.
- Integrated CG targets, suspension hard-points, safety regulations, and packaging constraints into layout; optimized stiffness-to-weight ratio and selective coring via FEA to reduce mass while maintaining crash safety.
- Generated layup-ready geometry and tooling surfaces in Siemens NX to support composite manufacturing and iterative design validation.

Skills

Design Tools: Siemens NX/Simcenter/Teamcenter, Altair Hypermesh, Autodesk Inventor/Fusion 360, SolidWorks, OnShape, Bambu Slicer
Manufacturing: Hand Layups: VARTM, Pre-Preg, Wet; Bambu X1C, Bambu P1S, AnkerMake M5
Programming Languages: Matlab, Python, C, Java, HTML, JS, CSS