

# Badger Solar Racing Work History

## *Abstract*

I was a member and leader of the Badger Solar Racing solar car team at the University of Wisconsin-Madison. Our team's mission was to build and race a piloted solar powered battery electric vehicle in the annual Formula Sun Grand Prix and biennial American Solar Challenge. While as a member, we competed in the 2023 and 2024 Formula Sun Grand Prix with our team's first ever car.

I took on a multitude of roles to help contribute to our team's success, and in my final year stepped into a leadership and consulting role to help guide our team's younger members on the process of designing, validating, building, and testing a new solar car, codenamed Car 2, for the 2026 American Solar Challenge.

## *Roles*

***Body and Chassis Manufacturing Member***

*August 2021 – August 2024*

***Ergonomics Design Member***

*August 2023 – July 2024*

***Race Strategy Team Member***

*June 2023 – June 2024*

***Industry Relations Lead***

*May 2023 – May 2024*

***Operations Director***

*May 2024 – May 2025*

***Lead and Development Driver***

*December 2021 – May 2025*

- On the body and chassis team, I helped to build the carbon fiber body and chassis of our car. Some of my tasks included:
  - Laying up and curing pre-impregnated carbon fiber for the body of our car. ○ Preprocessing molds and doing wet layups of carbon fiber fabric.
  - Learning to create custom vacuum bags for both the wet layups and pre-impregnated layups.
  - Postprocessing our carbon fiber to create grommet holes for bolts and round any sharp edges.
- I also helped the Ergonomics team through Computer Aided Design.
  - I completed a redesign of the car's steering wheel to be smaller in profile, while integrating the functionality of a regenerative brake button and potentiometer into the front of the wheel.
  - I Also created secondary pieces to hold the car's dashboard and start up sequence buttons (high voltage on/off, supplemental battery on/off, motor controller on/off, motor direction, and power level).
- I have also helped the race strategy team in the electrical division of the team. Some of my responsibilities included:
  - Helping to create and refine MATLAB programs that simulated solar panel efficiency, projected solar input through the car's projected race route and time, and mechanical and aero losses of the car in specific situations.
- My most recent leadership position within this club is officially titled Operations Director. As the Operations Director, I oversee the welfare of the club and timeline of any major processes that are due to occur within the school year and during the summer before our annual competition. My responsibilities include:
  - Managing finances and relationships with our current sponsors.
  - Registering for school events and creating relationships within the engineering department.
  - Managing the timeline of design/production of our solar car alongside our president, mechanical director, and electrical director.
- As the lead and development driver, I oversaw testing feedback and driver selection, since our competition requires a minimum of 2 drivers and a maximum of four. My responsibilities included:
  - Consulting on driver positioning within the car's cockpit and helped to created briefing and test plans for our drivers
  - Helped to inform race strategy on car handling characteristics and real time battery degradation to help refine simulation models
  - Creating driver briefings and requirements for driver selection, and documents outlining driving targets, track characteristics, and processes for egress, startup/shutdown of the car, etc. in collaboration with each process' subject matter expert