

CRIMSON **RACING**

FORMULA **SAE**



February 2024 Newsletter

Hello from Crimson Racing!

As competition approaches, we're eager to update you on our progress. Before diving in, we wanted to express our gratitude for the feedback we've received on our newsletter- your input has fueled our enhancements, and we are thrilled to showcase our team happenings in a more engaging way. So, buckle up and join us as we highlight everything our team has to offer!



New Livery

CR22 has a new look! The aerodynamic package now includes the logos and names of our generous sponsors and supporters. We think the splash of color from the vinyl completes the look of our car.



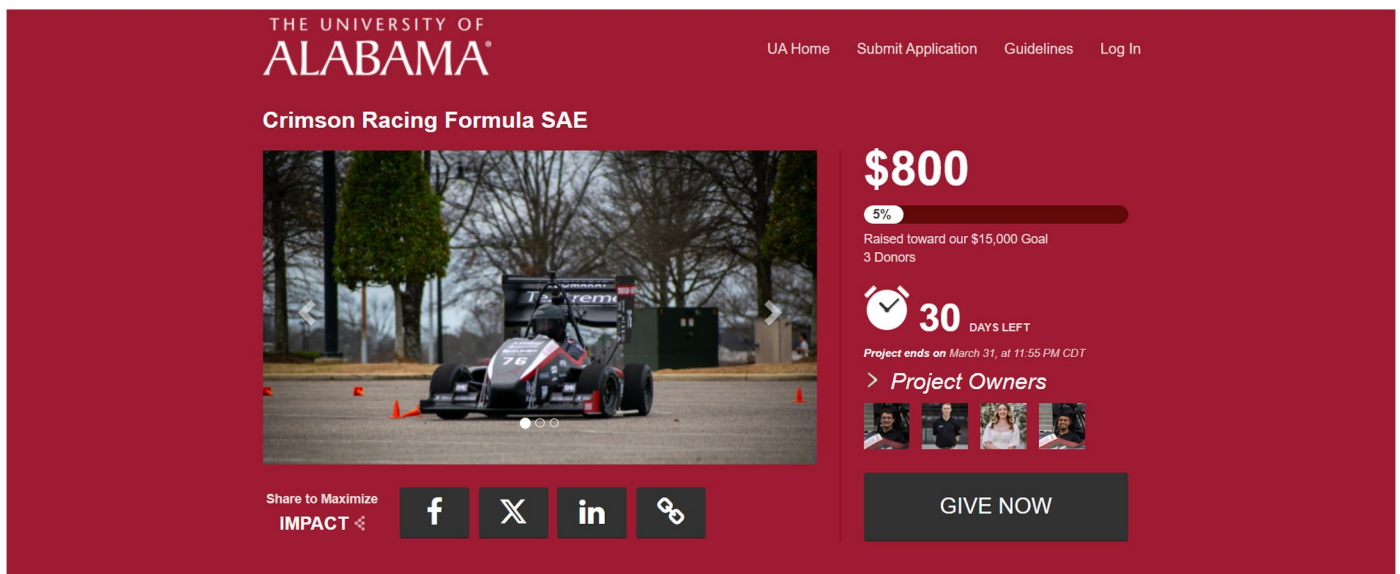
Speaking of sponsors, Casados Design recently helped us clearcoat our aerodynamic package in their paint booth. We greatly appreciated the opportunity to work with them and utilize their space. They taught us many new techniques for painting which helped us achieve our satin finish. The clearcoat will protect the carbon long term, with the added benefit of giving the car a sharp look!

Crowdfunding

Moving onto the business-oriented side of things, Crimson Racing's annual crowdfunding campaign will run from March 1st through March 31st! We have set a goal of \$15,000 for our campaign, which is our most ambitious yet, but an anonymous donor has offered to match the first \$7,500 in donations, so please consider donating early to have your gift doubled!

Crowdfunding donations are a sizable part of the team's budget and are integral to helping the team finish the year successfully. A large focus for our crowdfunding campaign this year is to purchase new safety equipment for our team members. This includes personal protective equipment such as safety glasses, gloves, and coveralls to best comply with our shop safety guidelines as well as new driver safety equipment. Check out our crowdfunding page and consider donating at the link below!

<https://crowdfunding.ua.edu/crimsonracing2024>



The screenshot shows a crowdfunding page for "Crimson Racing Formula SAE" on "THE UNIVERSITY OF ALABAMA" platform. The page features a video of a Formula SAE car on a track. To the right of the video, it displays a goal of \$800, a progress bar at 5%, and a countdown timer for 30 days left. Below the video are social media sharing buttons for Facebook, Twitter, LinkedIn, and Email. A "GIVE NOW" button is prominently displayed at the bottom right.

THE UNIVERSITY OF ALABAMA

UA Home Submit Application Guidelines Log In

Crimson Racing Formula SAE

\$800

5% Raised toward our \$15,000 Goal 3 Donors

30 DAYS LEFT

Project ends on March 31, at 11:55 PM CDT

> Project Owners

Share to Maximize IMPACT

f X in e

GIVE NOW

Apparel

We are also in the process of designing our new apparel for this year. We should have our designs finalized by early March with purchasing available shortly after. Once we have a link available, we will send it out for you to be able to purchase. We have some exciting updates to our apparel this year, including multiple color options for most items, men's and women's cuts, and shipping directly to you. The team will receive a portion of the proceeds of apparel purchases, so stay tuned for updates and consider getting yourself some new gear!

Presentation

The presentation team is also busy getting ready for the business portion of the competition. This year's scenario has recently been released. They will be presenting online in April, with the chance of presenting at competition if they place in the top ten.

Go Kart Project

The go kart project offers new members an opportunity to acclimateto the dynamic environment of the team while building up some basic design and fabrication skills.This steel framed chassis driven by a single cylinder Briggs and Strattonengineis passed down from each first-year generation of Crimson Racing to the next, modified and repaired in the unique style and priorities of new members from across the team.

This year's crew has been focused on reviving the kart from its time in storage. Rebuilding and restoring the brakes, engine, and carburetor, as well as addressing wear and tear in the fuel system and chassis, have been major tasks for the project so far. The kart is now in working order and our new members are eagerly waiting for the chance to test it alongside CR22 at the next drive day.

Simulator Task Force

This semester the simulator task force finalized brand new visual models for both our car and our testing lot. The goal of this is to increase immersion for our drivers in the sim. They have been working closely with the driver development program to ensure the sim is an accurate representation of driving the physical car.

Moving forward, they will continue to tune the physics model based on measured data, CAD data, and driver feedback. Their current projects include setting up live telemetry data from simulator sessions to compare to the physical car, aligning the tuning capabilities in the sim to that of the real car, and researching potential hardware improvements.



New Lat G Record

At one of our drive days this month, we reached a new sustained maximum lateral acceleration for CR22 of 1.65G. We were able to achieve this by tuning the ride height to keep our floor in its ideal range to extract the maximum performance. We also tuned our car's setup for LCO tires, a softer compound than previously run, to achieve peak grip in as many places around the track as possible. The higher lateral acceleration will improve our performance in the skid pad, autocross, and endurance events by allowing us to maintain higher corner speeds and thus faster times.



Sidepod Tab Issues

In adjusting our ride height, it became necessary to raise the floor, which meant raising the sidepods as well. Consequently, the old sidepod tabs no longer aligned with the new sidepod positions, so new tabs were made and welded. However, the new upper tabs on the leading edges of the sidepods are quite long, so when the car was driving, this caused a springboard effect, leading the sidepods to flutter. To rectify this issue, we increased the stiffness of the tabs by adding gussets to the back. At the following drive day, the sidepods remained stable without fluttering.

Bellcranks

New bellcranks were recently manufactured for CR22. The weight per side of the car dropped by 0.438 lbs with the new front bellcranks due to less material and the switch from heavy bearings to lightweight bushings. Manufacturing time also went from 12 hours on the mill for both front bellcranks to under 2 hours with the waterjet cut and mill finishing. With over 80% of time cut in manufacturing we look forward to seeing what else we can do to maximize efficiency in the future.

EV Updates

After extensive simulation and energy usage calculations, we have purchased over 100 Lithium-Ion modules from ENEPAQ and are awaiting its delivery to begin assembly of our High Voltage Battery Pack. In addition to the battery pack, we have reached out to Mitchell Instruments for multiple sets of high voltage personal protective equipment (PPE), ensuring the safety of our team members working with these electric systems. All the necessary test bench hardware is currently being delivered.

This equipment will facilitate the setup of our high voltage area, allowing comprehensive testing and analysis of our high voltage systems leading to future development for Crimson Racing EV. We recently had the privilege of meeting with Dr. Lemmon, one of UA's professors specializing in power electronics applications, and associates from the Mercedes Benz Battery Analysis Center. During these meetings, we gained valuable advice and insights on HV safety protocols and grounding techniques to further optimize our test bench.

E-Day 2024

At E-Day we had to chance to meet with local middle and high school students. We got to show off CR22 and teach them all about Formula SAE!

It was a great opportunity to engage with our community while sharing our experiences as students. We hope to see many of them around campus in the future!



Old Noses Find a New Home

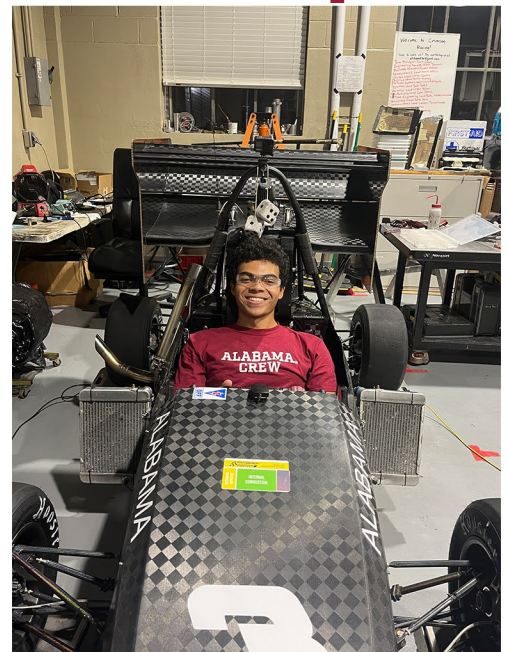
The noses of our retired cars have been rehung in the shop! Dating back to 2007, the noses are an integral part of our team history. They showcase the progress Crimson Racing has made over the years and remind us of how far we've come as they transition from fiberglass to carbon fiber. They are a reminder of the dedication and hard work it takes to design and manufacture a car in a year, as we drive towards the future on the foundation built by our alumni. We look forward to one day having the noses of the cars we've worked on hung alongside the others.



Member Spotlight: Caleb Joseph

This month, we would like to recognize one of our new members, Caleb Joseph. Caleb is a freshman from Shreveport, LA studying Mechanical Engineering. He is on the Chassis subteam and has been leading the Drive Simulation project. As a frame junior engineer, he has been working on his welding skills alongside other frame-related projects such as the torsional stiffness jig.

Caleb's design for the steering wheel front shell will be manufactured soon. His visual models for CR22 and the Northeast commuter test lot were also recently integrated into the simulator to help our drivers. Additionally, Caleb has done a fantastic job taking pictures and videos at drive days, as it is something he really enjoys.



Wrapping Up

For now, it's back to the shop for us. We hope you enjoyed this revamped version of our newsletter. Thank you for your continuous support and stay tuned for further updates as CR22 races toward competition at Michigan International Speedway!



Until next time,

Roll Tide!

A **CRIMSON**
RACING