THE SPARTAN RACER

SEPTEMBER 2021

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GO FAST

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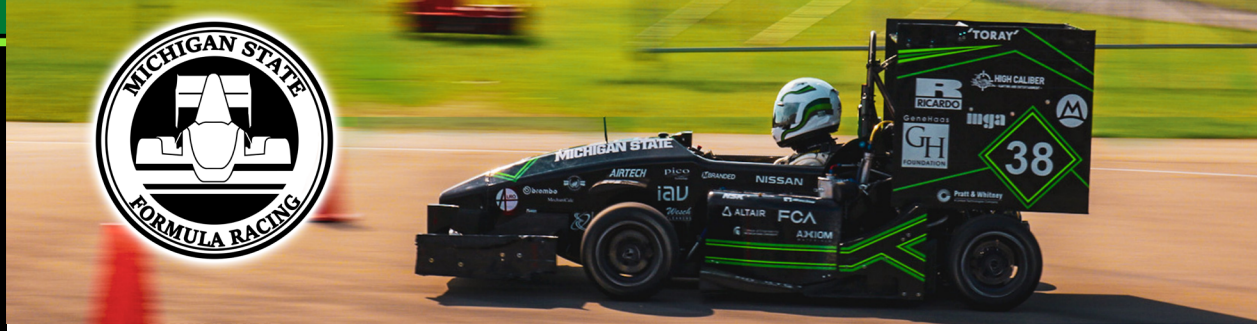
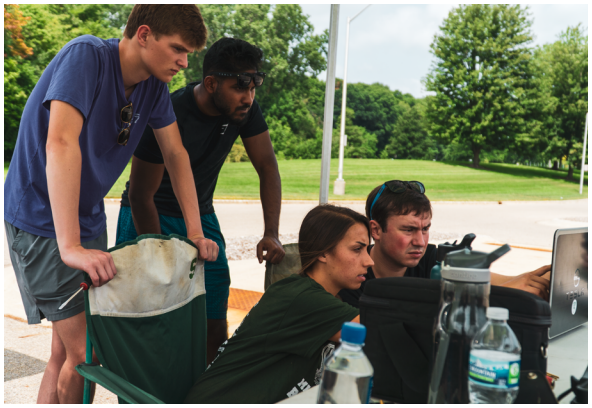


Pittsburgh Shootout 2021

With the new team structure in place, the team values knowledge transfer above anything. As new leads continued to figure out where design left off and what still needs to be done before the manufacturing of SR-22 starts, everyone collectively reevaluated the team and car goals.



New leads analyzing data during testing

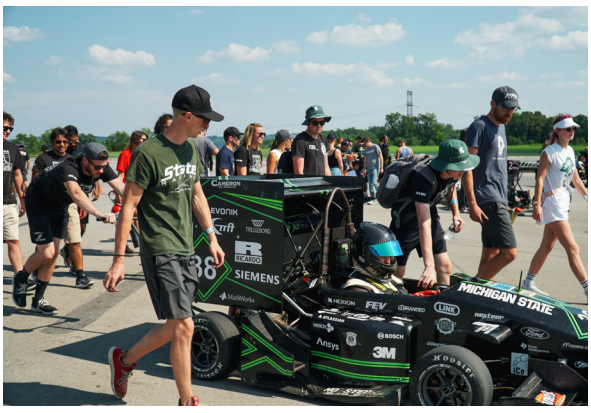
As the Pittsburgh Shootout, hosted by Pitt FSAE, was coming up on August 21st, the team was eager to drive SR-20 competitively one last time. A full vehicle inspection was done to the car, and testing resumed to give drivers more seat time. Since drivers first drove with aerodynamics at competition, it was crucial to tune the car based on their feedback.

Testing came with a few challenges, as the brake fluid vaporized and spilled out of the brake bleeder valves. The Outboard Assemblies lead, Matthew Ajlouny, switched out the brake fluid which fixed the issue. However, upon further inspection, a puddle of brake fluid was found under the master cylinders. After examining the banjo fitting, it was determined that a copper crush washer would be used instead of an aluminum crush washer.

The team left East Lansing early on Friday, August 20th, as soon as they packed up and finished working out some last minute issues. With technical inspection open on the night of arrival, the team was able to pass tech before the actual event began.

Unfortunately, the next day brought on complications, as the team reached brake pressures they have never seen before (upwards of 2100 psi). This is the result of the team's most experienced driver, Jimmy Provax, advising the team's novice driver, Dave Yonkers, to "mash the brakes." The front brake calipers were leaking fluid and the rear line exploded. The team suspected that the line was nicked during regular vehicle maintenance. Shortly after replacing the brake line, the brake test was passed.

No time was wasted on getting some laps in with Jimmy Provax. The team got back into line immediately after pulling off the track.



The team walking to the track at Pittsburgh

After a long day, SR-20 placed 3rd overall at the Pittsburgh Shootout. It was good experience for those unable to attend FSAE Michigan.

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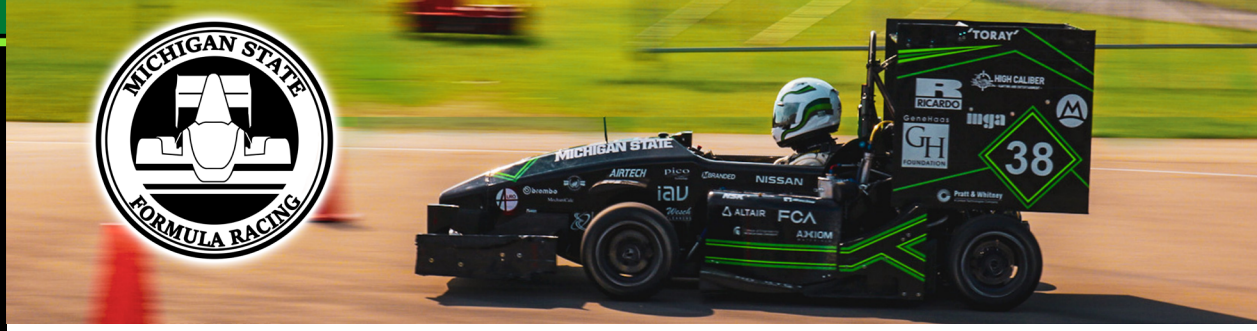
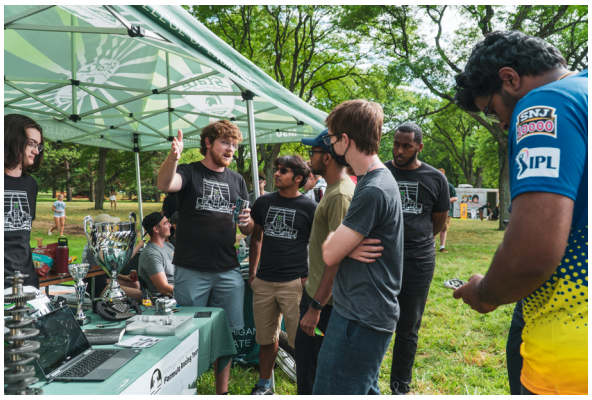


University Outreach

With Michigan State University officially back in person, students and staff could not be more eager to get back to work. SR-19 was reassembled and put on display in the engineering building, meanwhile, the team has also been reaching out to young engineering students through various events such as Sparticipation and Colluqium for the College of Engineering. This is an exciting time to inspire students what numerous hours of hard work and determination can produce.

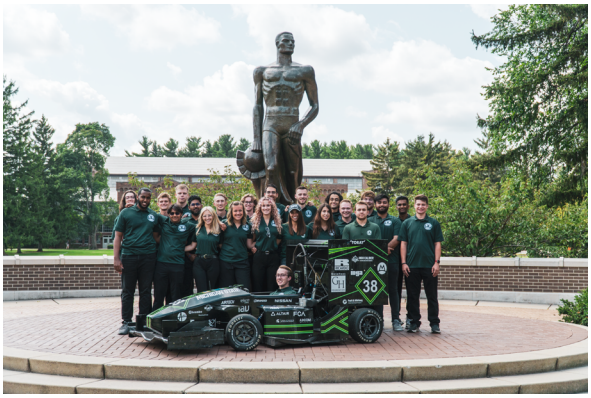


Team members at Sparticipation

Bringing a car to recruitment events is certainly an attention-grabber, and this year was no different. Brochures were handed out as leads explained all that the team has to offer to other students.

One of the biggest misconceptions of those interested in joining the team is that they must have previous experience in engineering or manufacturing to be able to join. Some also believe that they must have interest in the automotive industry, however, it doesn't matter what someone's previous background entails. The most alluring thing about the team is that everyone is accepted, but it is those who possess the desire to learn and the passion to work who get the most out of the club.

For over thirty years, Michigan State Formula Racing has founded itself off of the core value of providing its members the opportunity to apply what they have learned in the classroom to a faced-paced work environment, riddled with problem solving scenarios. From procuring sponsors and participating in community outreach events, to the design process and on-track testing and validation, the learning never stops. Team members develop an in-depth understanding of technical theory, manufacturing processes, cost effectiveness, and



2021-2022 team photo

inter-personal skills. Upon graduation, experienced members of the team posses the skills to make an immediate impact in the workforce.

With the first informational meeting of the season occurring on September 23rd and 24th, the team is eager to welcome the next generation of Spartan Engineers. For more information regarding these events, be sure to follow the team's social media for updates!

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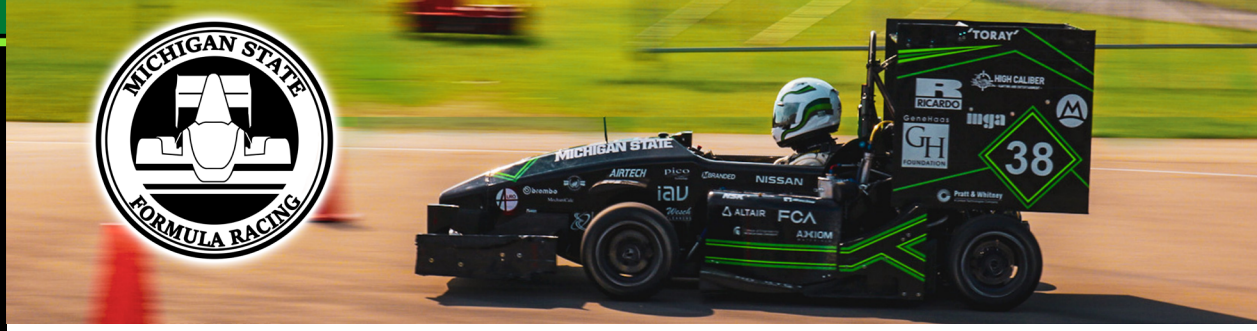
MEMBERS



Name: Bashar Byrouthy
Role: Cooling Project Lead
Hometown: Accra, Ghana
Major: Mechanical Engineering
Class Standing: Junior

Why did you choose to study Mechanical Engineering?

Mechanical engineering provides enough avenues to allow its graduates to enter most industries without having to worry about the possibility of losing interest in a specific field. I've always had a lifelong curiosity for the mechanical aspect of things. This even led me to attempt "fixing" a stationary bicycle at age three, which resulted in me losing part of my index finger to a bicycle that, ultimately, remained unfixed.

What are you most excited about for this upcoming racing season?

Despite this being my third year on the team, it will be my first year leading a subsystem where I'm able to directly implement my designs onto the next car, as opposed to a more long-term R&D role like I had last year. I am very excited to use skills I learned from my internships to analyze our cooling data, run simulations, and come up with designs that end up helping the team at competitions next year: an accomplishment long overdue. Also, with the return of in-person meetings, I look forward to getting back into the rhythm of going to the shop every night after classes, and to have everyone there to share ideas with and learn from.

What are some of your favorite hobbies or activities outside of the racing team?

I enjoy playing around with digital 3D art whenever I have the time. There are tons of styles to experiment with, and I especially like the photography aspect of it. So, not only can you create any shapes and materials you want, be it for photorealistic or abstract or any other style, but you also have to think about lighting, the environment, and what kind of camera you want to use for the render to recreate exactly the image you have in your mind. In a way, I have the liberty to create photographs I could never take in the real world.

Name: Andrew McNamara
Role: Composite Structures Lead
Hometown: Petoskey, Michigan
Major: Mechanical Engineering
Class Standing: Senior

What does your role on the team entail?

My role on the team entails designing and fabricating parts that are most commonly made out of metal and composite materials. I have been working on the design and fabrication of our new carbon suspension and started the design of carbon fiber wheels. I also help oversee any structure and FEA related questions that other leads may come across when designing their sub-system parts.

How have you been able to make a difference in the team?

I like to push our team to get away from traditional designs and look at more experimental designs. This helps us to create a lighter, faster car that will perform better at competition. These experimental designs can also help expand some of our member's talents, whether that be in topology optimization with Altair Inspire, or through laminate optimization in HyperMesh OptiStruct.

What are you most excited about for this upcoming racing season?

I am most excited about working with the team again in our shop. Due to being out of state this past summer for my internship, I have yet to see SR-20 run. I am also looking forward to meeting all the new leads for the first time.

Do you have any professional work experience?

I have had the amazing opportunity to intern at Tesla as a Manufacturing Engineering Intern in the body division. I coordinated with many production associates, contractors, and technicians to manufacture vehicles. I also assisted in the design of tooling fixtures using CATIA V5 and worked with engineers from other departments to find the optimal solution in scenarios such as quality, design, or the production level of the factory.

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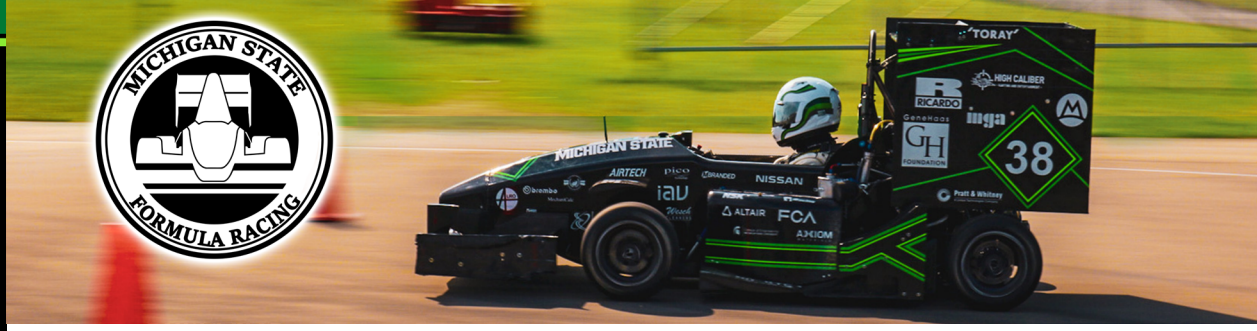
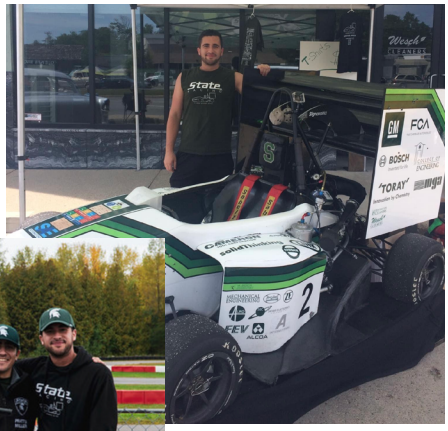
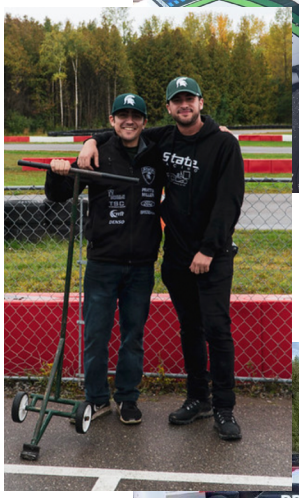
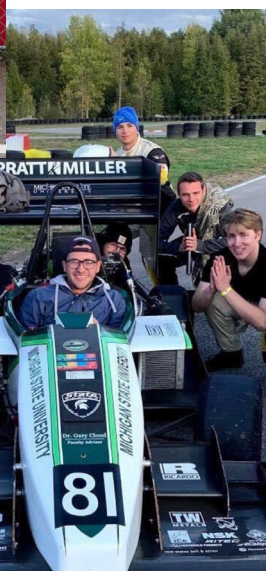
ALUMNI



Name: Miri Jakupi
Hometown: Troy, Michigan
Degree: B.S. Mechanical Engineering (2020)
Years on the team: 2017-2020
Roles: Suspension Lead (2019)
Suspension Kinematics Lead (2020)







How did you contribute to the advancement of Michigan State Formula Racing?

My main goal as suspension lead was to make sure the system was reliable, but also to maintain a well-tuned and agile vehicle for the drivers. Reliability was increased by tightening tolerances and focusing on manufacturing quality. Maneuverability was improved by changing tire size, then making changes in the steering geometry to maximize gains in agility. I was also able to procure a chassis slip angle sensor that would allow the team to do more vehicle dynamics data acquisition and analysis.

What is your favorite memory from the team?

The cars I helped design and build while on the team were Car 16, 11, and 38. Seeing the car finish 2nd place in Nebraska my first year, spending countless design and manufacturing hours in the shop during weeks leading up to our first drives, attending competitions, and celebrating with the team are things that I will always remember. As mentioned by other alumni, the family-like friendships will be valued the most after graduation, since you spend so much time with others that have the same passions as yo while in formula.

What is your current professional role?

I currently work at Ford Motor Company as a Chassis System Engineer on the Mustang, Ford Explorer, and Lincoln Aviator programs. I'm in charge of these vehicles' suspension systems, including hard points, alignment, ride heights, and rate curves. I do analytical modeling using ADAMS software to analyze/meet chassis and vehicle dynamic targets (steering, handling, ride NVH, acceleration and braking targets). I also do some quality assurance work by maintaining plant vehicles' alignment, weight, and ride height specifications.

How did your experience as a member of Michigan State Formula Racing help shape your future?

Without a doubt, I was able to secure my current job from my experience on the MSU Formula Racing Team, and I am very grateful for that. A lot of the responsibilities that I have at Ford are very similar to what I had on the team as Suspension Lead. Ford realizes how valuable this fast-paced, real-life experience is. Beyond obtaining technical skills, I learned to effectively manage my time and work as a team member that worked towards overall goals. The MSU Formula Team has had an extremely positive impact on my life and career.

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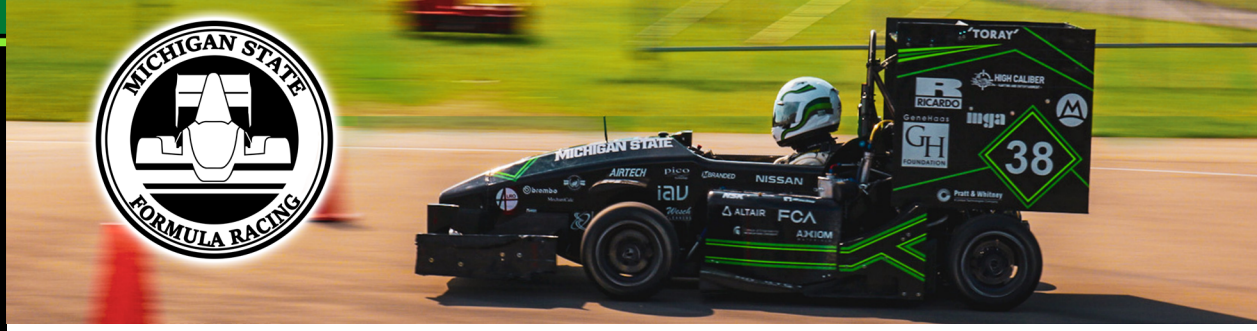
SPONSORS



Name: Raising Cane's Chicken Fingers
Location: Baton Rouge, Louisiana

Since the first Raising Cane's that opened in 1996, they have prided themselves with one love - quality chicken finger meals. Though their menu is quite limited, they take extra care in producing a high quality product served quickly and conveniently. Their vision is to expand their business all over the world and be the face for quality chicken finger meals while maintaining a great crew, cool culture, and an active community involvement.

The team has always enjoyed the tradition of stopping for Raising Cane's on the way to compete. This year, we were ecstatic to find out the General Manager, Craig Ross, and his incredible staff in Youngstown were willing to support us by providing some quality meals and some cool swag!

Thank you Raising Cane's for not letting the tradition fade away. We will make sure to stop by on the way to our next competition!

Name: Ricardo
Location: Shoreham-by-Sea, UK

Known for their global strategic engineering and environmental consultancy that specializes in the transport, energy and scarce recourse sectors, Ricardo has been a trusted sponsor for years.

The team has appreciated their help in providing 5 seats of WAVE, VECTIS, IGNITE (including IMoved, Thermofluid and Powertrain modules), RDM - 32 CPU and 1 seat of HEEDS. The most beneficial being Ricardo WAVE which has helped the team by being a 1D simulation software that simulates airflow through our powertrain system from its induction (intake) to exiting (exhaust). Ricardo WAVE is also used for its acoustic simulation post processing which allows people to analyze sound wave properties like frequency, sound pressure level, and engine orders.

Without Ricardo, the team would not have the applications to help better our intake and exhaust system. We hope to continue this sponsorship for years to come and appreciate Ricardo for their continued support.

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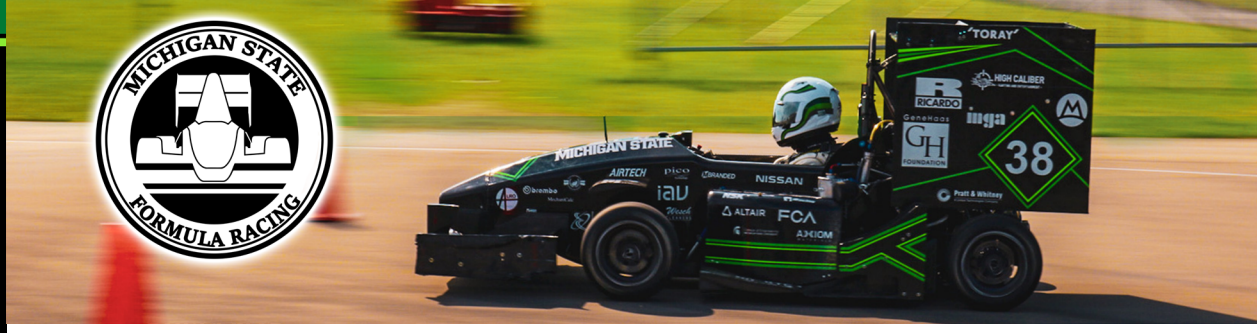

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