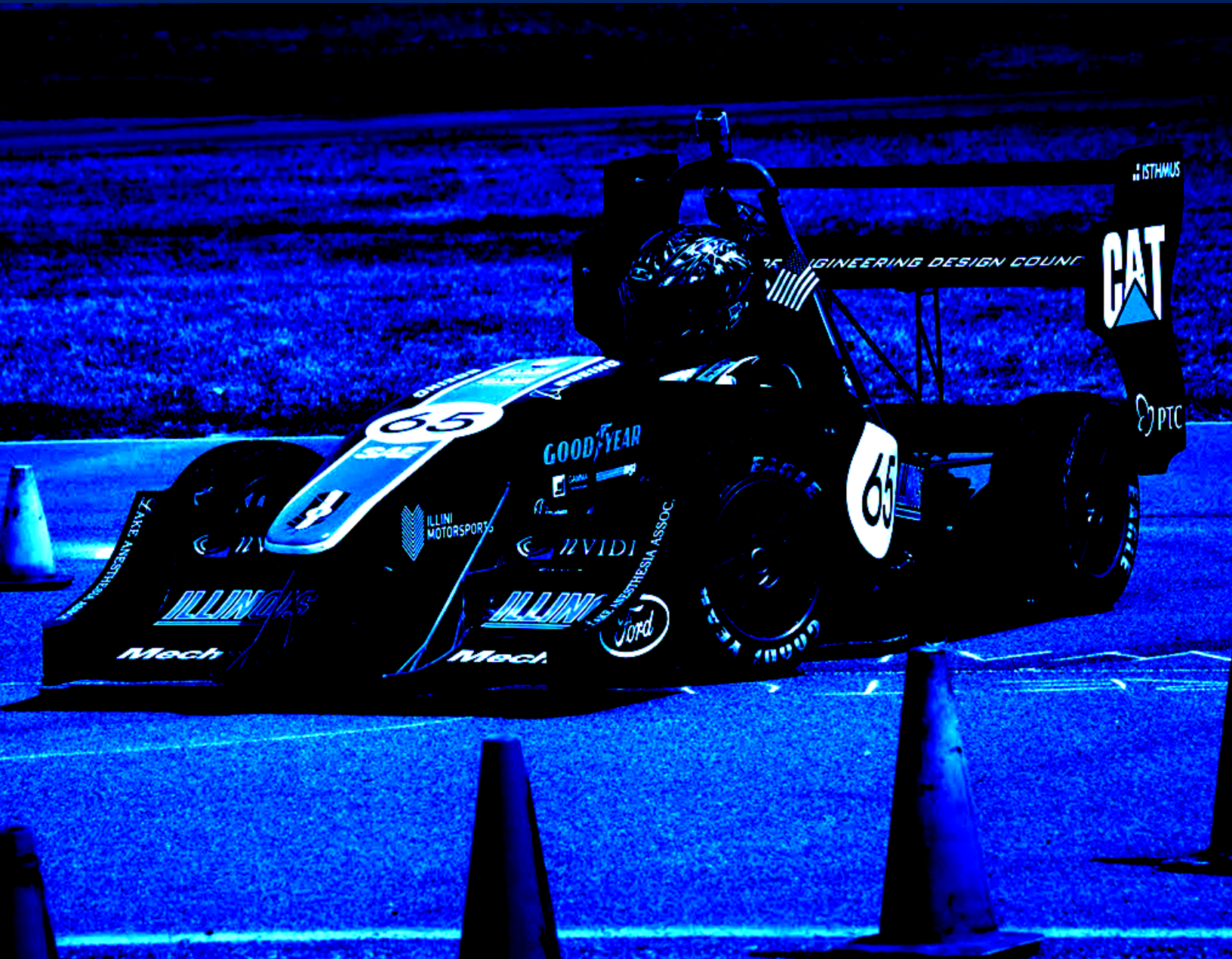




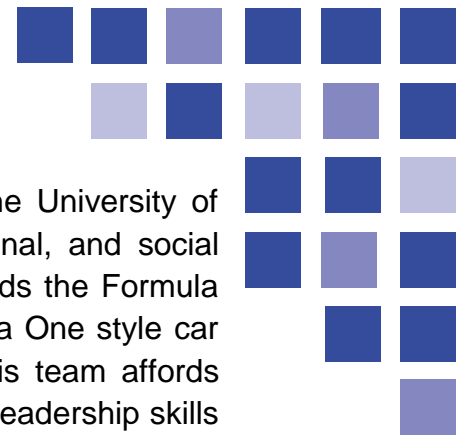
# ILLINI MOTORSPORTS

UNIVERSITY OF ILLINOIS  
URBANA / CHAMPAIGN  
SOCIETY OF AUTOMOTIVE ENGINEERS

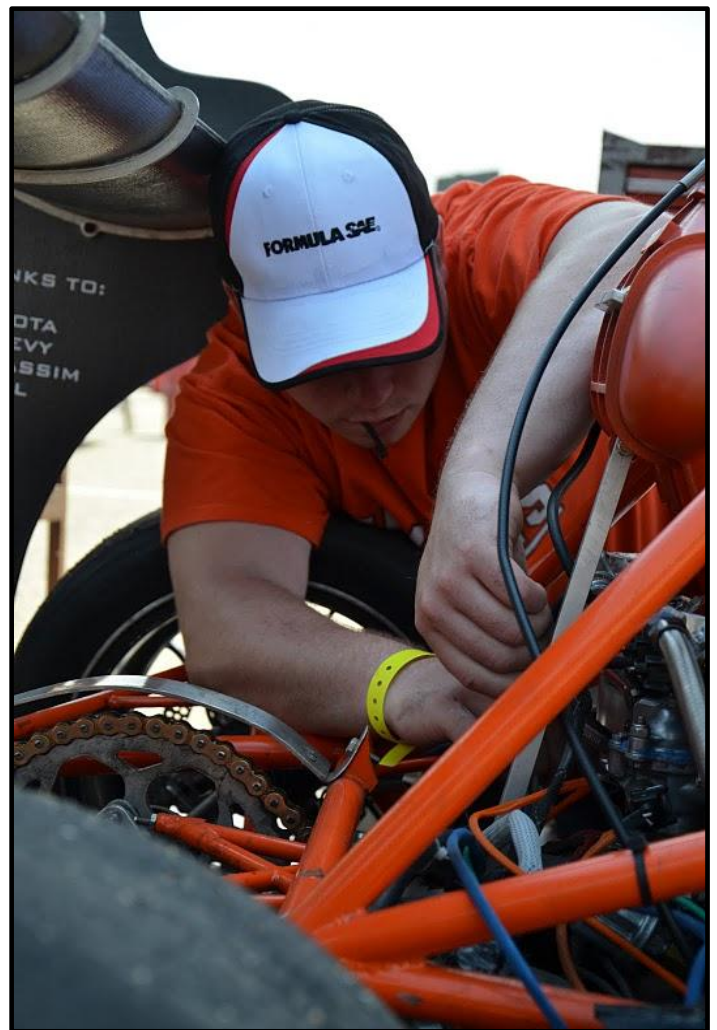


## Corporate Sponsorship

# THE PROGRAM



The collegiate chapter of the Society of Automotive Engineers (SAE) at the University of Illinois aims to provide its members with numerous educational, professional, and social opportunities related to vehicular design. As part of this initiative, UIUC fields the Formula SAE team. This team designs, constructs, and races a scaled down Formula One style car against university-level teams from all over the world. Participation on this team affords students the opportunity to gain real-world engineering, communication, and leadership skills that are otherwise not necessarily available in an academic setting. Furthermore, engineering students have the chance to apply the theory they learn in the classroom, leading to a better understanding of their engineering discipline overall. Upon the completion of their degree, FSAE graduates are among the most highly sought-after candidates for engineering jobs due to their enthusiasm for the field and their experience with the application of engineering theory.

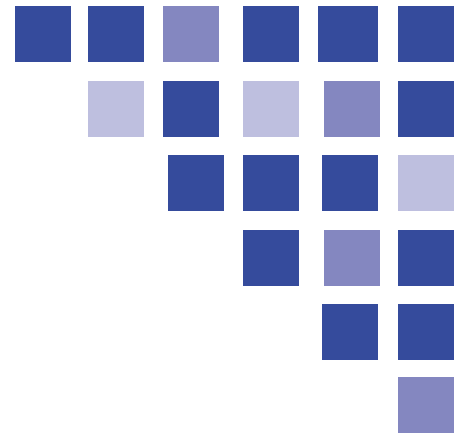


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# FORMULA SAE



## What it's all about...

The Challenge: A fictional manufacturing company has enlisted the services of a design team to develop a small formula-style racing car targeted at the nonprofessional weekend autocross enthusiast. Based on a predetermined set of templates and rules, they must design the fastest, most effective racing machine possible while minimizing costs, maximizing reliability, and utilizing the latest technologies in racing today. Formula SAE students have the opportunity to become this design team, using skills learned in the classroom to execute this company's vision. Each year, competitions are held in various places all over the world (Michigan, Nebraska, Australia, Brazil, Italy, Germany, etc.) where these design teams are able to bring their car and compete against some of the best engineering students from across the planet. Each competition has a broad range of events with a certain amount of points allotted to each as follows.

### Static Events:

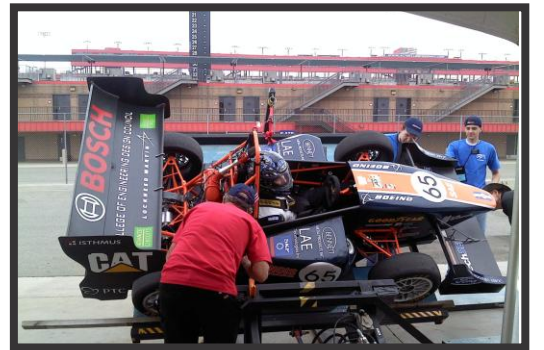
Presentation	75
Engineering Design	150
Cost Analysis	100

### Dynamic Events:

Acceleration	75
Skid-Pad	50
Autocross	150
Fuel Economy	100
Endurance	300

Total Points 1,000

Such a diverse set of grading criteria demonstrate how Formula SAE competitions foster multiple disciplines amongst its participants. Team members must learn not just how to create a successful race vehicle, but also how to defend their designs, and make the vehicle marketable to prospect buyers.

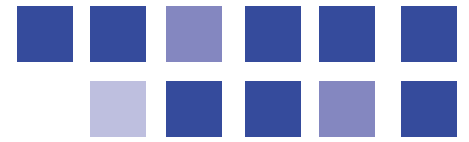


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# DESIGN FOR SUCCESS



For our 2011 entry, our team designed an evolution of the 2010 car, retaining its best elements while incorporating improvements to maximize performance. Based on the success of last year's car we opted to continue using an aerodynamics packaged but redesigned all of the elements to be more effective while weighing less. These improvements were accomplished by implementing more advanced computer simulations and manufacturing processes. After careful consideration it was decided to retain the Honda F4i engine from the previous year and improve performance by applying what we had learned. This goal was accomplished through aggressive simulation, physical testing, and the implementation of high performance engine

upgrades. The end result was an engine with more horsepower than any previous year with more usable low-end torque. Our new and improved racer had a slow start to the annual competitions due to an engine failure during the Michigan Competition endurance event. This failure was caused by insufficient oil cooling. While the car was running, however, it showed that it was a force to be reckoned with, taking 6<sup>th</sup> place in the Skidpad event out of the 108 competing teams, but finishing 40<sup>th</sup> overall. After the Michigan the team continued to test and reconfigure the car making it a stronger competitor. These efforts were rewarded in our second competition in California. Our car, despite still battling cooling issues, took 6<sup>th</sup> place overall out of 86 registered teams. Our strongest events were: Design 8<sup>th</sup> place (tied), Skidpad 6<sup>th</sup> place, Autocross 8<sup>th</sup> place, and Endurance 9<sup>th</sup> place. All in all, a very strong finish to the competition season.



Going into the 2012 season, we are greatly looking forward to further evolving our design. Most importantly, we have opted to place a heavy emphasis on simulation and physical testing to help us further refine our package and extract it's full potential. Here are some short blurbs from our team leaders about what their goals are for the 2011 contender:

## Powertrain

(Led by Ryne Jones)

On the engine side, transient tuning and cooling analysis will be the main focus this season. Based on last year's tune, we're looking to expand our knowledge, focusing specifically on our

interpolation of MAT (manifold absolute temperature). Also on the docket this year is the development of a transient tune to better compensate for our acceleration enrichments along with our idle quality which will improve fuel economy. Last year we designed a new intake and exhaust. Along with an intake camshaft adjustment the new

intake gave us a better-balanced power band by increasing low-end torque. This year we are going to validate the flow characteristics in the intake and verify we have an adequate design. Cooling was a major issue that did not receive enough attention last year due to the lack of testing time. As a result, it cost us a motor at the Michigan event during endurance. This year, we are going to test the cooling of both the radiator and oil cooler. With the help of a few sponsors we are hoping to acquire new sensors on the engine.

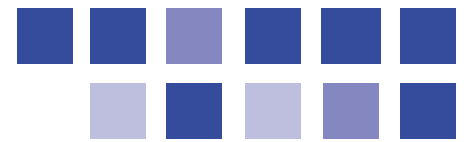


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# DESIGN FOR SUCCESS



These will condense the sensors we have into smaller packaging, thus reducing excess wiring and weight.

Our drivetrain was very well designed last year and much will remain the same. The primary focus will be on validation of this design which will include adding brake pressure sensors and rotor temperature indicators. Our differential will be reevaluated this year as well to determine if it could be condensed into a smaller package. Also, gearing ratio and hub design will receive additional consideration with the focus of better competition performance and serviceability in mind. New for this year, carbon fiber rims that use machined aluminum spokes and centers will be developed. Such a project has the dual advantage of reducing unsprung weight and rotating mass.

## Chassis

(Led by Gregory Catrambone and Felipe Pugas)

The main focus for this year's chassis design will be to improve rear suspension packaging to allow for easy implementation of anti-roll bars. Extensive finite element analysis simulations will also be run, allowing us to optimize tube selections and save weight. The weight reduction target for this year is 8-10lbs. The chassis is also going to be modeled in a way that allows the individual tube profiles to be extracted for CNC end profiling. This will improve the dimensional accuracy of the chassis while also improving the fit and finish.

## Electronics

(Led by Jack Sormaz)

This year the electronics package will work off the success of the student developed data acquisition system from the previous car. Offering real time wireless feedback to our engineers during the race, the data system allowed us to constantly monitor the excessive engine temperatures seen at the California event, ultimately allowing for such a successful finish. Wiring harness and enclosure design will be tightly repackaged with the car to allow for ease of troubleshooting and simple sensor addition when necessary.



## Aerodynamics

(Led by Kyle Gabry)

After exemplary reviews on the 2011 aerodynamics package, the main focus for 2012 is to fix the few flaws without negatively affecting the car performance. Package mounting will be one of the main focuses of the

redesign. Further package validation by employing iterative CFD analysis will ensure an equal if not better performance after necessary changes have been made. As weight is always an issue, in an effort to make the car lighter, manufacturing will be given more consideration during the design process to ensure higher quality, light weight elements.

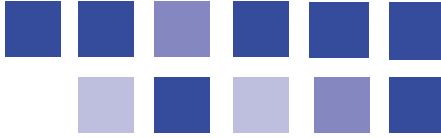


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# DESIGN FOR SUCCESS



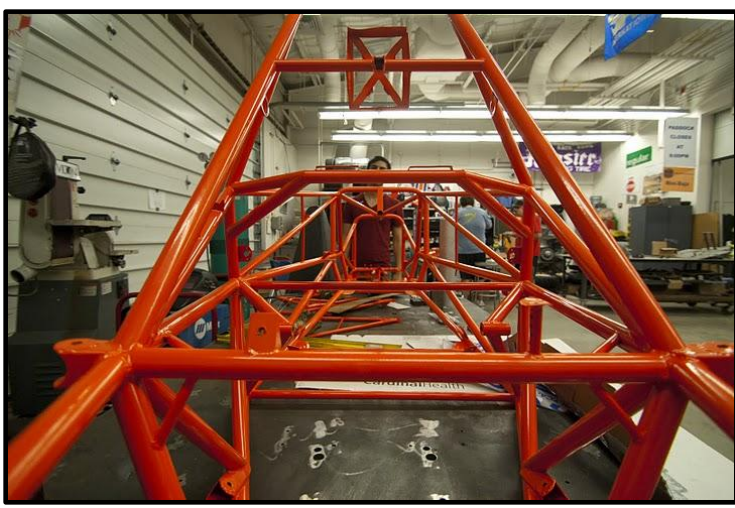
## Suspension

(Led by Jack Sormaz)

The primary focus for suspension this year is going to be compliance reduction, vehicle integration and weight reduction. Slight changes will be made to steering feedback to reduce driver fatigue while maintaining good feel. Toe and camber compliance will be specifically identified and managed. To reduce weight, we will be moving to carbon fiber wishbones and links from the current steel design. In terms of integration, specific attention will be paid to shock and rocker placement to allow for easy anti-roll bar integration. Another big focus is going to be primary timeline management to allow for increased testing and tuning time.

By fulfilling these design goals, we are certain that our program will maintain the high level of success that it has experienced over the past few years and that our car will once again be a top performer on the international stage. We expect that come May of 2011, this car will be competing for overall victory at both the Michigan and Nebraska events. At the same time we have also begun to set up the framework for a potential full re-design of the car for future seasons. This would include the possibility of switching from our current steel-tube chassis to a carbon fiber monocoque, as well as transitioning to different engine. Because such changes

would require a great deal of flexibility from all the other vehicle systems, a 2 to 3 year plan has been laid out where current sophomores and juniors would be responsible for the primary design and development of this future car with assistance from the seniors. We believe that by taking this amount of time to refine and test our ideas now, a completely redesigned car debuting in 2013 or 2014 could be highly competitive within its first year of competition.



KeyShot Demo (NOT FOR COMMERCIAL USE)



# WHY SUPPORT SAE?



Like all racing teams, Illini Motorsports heavily relies on corporate partnerships to operate. Despite our vehicle's consistent premier ranking amongst higher-budget teams built on substantially higher budgets, the cost of remaining competitive is always increasing. A breakdown of our projected budget for this year is provided below:



By becoming a sponsor of the University of Illinois Formula SAE team, you will be supporting a program with a proven track record (pun definitely intended) of producing some of the finest engineers in industry today. Some examples of companies that our recent grads have gone to work include: SpaceX, Lockheed Martin, Bosch, Northrop Grumman, Federal-Mongul, Navistar, Cummins, and many other industry leaders.

As mentioned earlier, participation on a Formula SAE team gives students the chance to apply lessons from the classroom and experience “real-world” engineering projects. Furthermore, participants pick up valuable leadership skills which are rarely developed in other collegiate organization. There truly is no other engineering extracurricular organization that prepares engineering students for industry like Formula SAE. In addition, your support of our team can deliver excellent return on investment. Because we bring our car to competitions around the country attended by schools from many parts of the world, your company would have the opportunity to experience global exposure to a well-reputed group of engineering professionals and academics, most of who are involved with state-of-the-art engineering firms and projects. On a much more intimate level, we routinely have sponsors visit our team either at our shop in Urbana or at any of our competitions. Visiting sponsors not only get to witness the design and construction of our car, but they also have the chance to speak to our engineers about their company. This allows our corporate partners to develop a “one-on-one” relationship with our engineers, thus making for a much more effective recruiting experience.

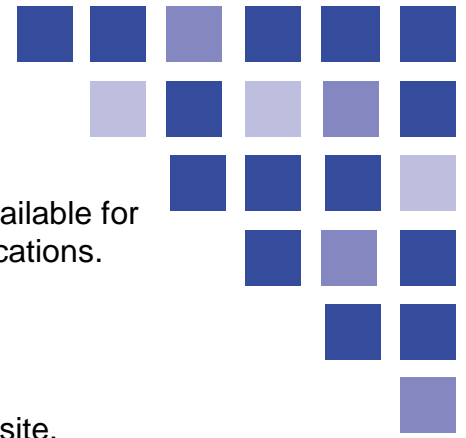


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# SPONSORSHIP LEVELS



## Orange and Blue Partnership – (\$20,000 and Above)

Largest logos placed in the most prominent areas of race vehicle. Car available for expos or day events. Company logo and name included in all team publications. Priority to team recruiting. (Includes all “Gold” benefits)

## Gold Partnership – (\$10,000 - \$19,999)

Large logo on race vehicle. Company logo displayed on all pages of website. (illinimotorsports.net) Distribution of cooperate recruiting material at team events. (Includes all “Silver” benefits)

## Silver Partnership – (\$5,000 - \$9,999)

Medium size logo on race vehicle. Large company logo and name displayed on sponsorship board at race event and any other SAE event. Invitation to speak with the Illini Motorsports team. Logo included on team apparel. (Includes all “Bronze” benefits)

## Bronze Partnership – (\$1,000 - \$4,999)

Small logo on race vehicle. Company Logo displayed on team website (illinimotorsports.net) including link to company website. Team photo and appreciation letter. (Includes all “Honorary” benefits)

## Honorary Member – (Up to \$1,000)

Company name on sponsorship board (displayed at all SAE events) and on team website (illinimotorsports.net). Sponsor newsletter subscription.

Sponsorship can be in the form of monetary donation, company resources and time, or in-kind donations such as materials, parts, or equipment.

As a University of Illinois sponsored student organization, Illini Motorsports is 501 (c)(3) tax-exempt, so all monetary and many in-kind donations are tax-deductible.

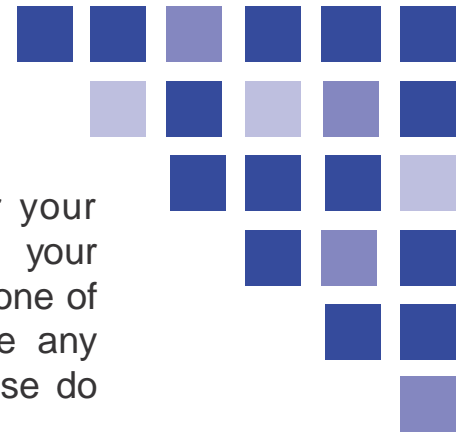


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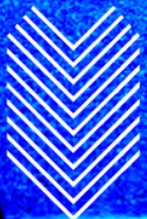
# THANK YOU!



The University of Illinois Formula SAE team thanks you for your thoughtful consideration. We hope we'll be able to add your organization to the list of partners that have helped us become one of the premier collegiate racing teams in the world. If you have any questions about our team or our SAE chapter in general, please do not hesitate to contact us!

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