UT Solar Vehicle Team Races at Circuit of the Americas [1]

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For the past year, students across several Cockrell School of Engineering departments have been applying their classroom training to tackle a large-scale engineering challenge: Design, build, test and race a vehicle run on solar power.

The University of Texas at Austin Solar Vehicles Team (UTSVT) will race its newest solar car, the TexSun, at the Formula Sun Grand Prix, June 24-29, at the Circuit of The Americas complex.

?The Formula Sun Grand Prix challenges students to address areas of energy management, aerodynamics, fabrication and high-tech materials,? said Edgar Farrera, Circuit of The Americas? director of sustainability. ?We hope students? involvement in this challenge inspires them to seek careers in these critical fields of study.?

UTSVT will serve as the local university host for the Formula Sun event, which is an annual collegiate solar car race. This is the first time the race has taken place on an official Formula 1 track.

?We?re very excited about the upcoming race,? said UTSVT president Neda Abdul-Razzak, a mechanical engineering and psychology senior. ?We are all hoping to finish first place, though completing the car in and of itself is extremely rewarding.?

The event is free and open to the public, concluding with a Public Day on Saturday, June 29,

where spectators can view the end of the race as well as solar energy exhibits and displays from high schools and local groups.

Twelve teams from universities around the country and one from Canada are competing in this year?s race. Circuit of The Americas is sponsoring the UT Solar Vehicles Team, covering $50,000 of costs associated with building the TexSun vehicle.

UTSVT is a volunteer, student-run organization comprised of approximately 50 members, most of whom are undergraduate engineering students.

The Formula Sun Grand Prix kicks off with three days of ?scrutineering,? in which teams must pass a rigorous set of regulations in order to enter their solar cars in the actual race. The race itself will take place over the last three days of the event, with the winner being determined by the most laps completed over the three-day racing period. Solar charging times for the cars will take place before and after racing times each day.

TexSun?s design differs from the team?s previous car partially because it has a smaller amount of surface area, allowing it to better cope with issues such as air resistance.

?You want the car to be as aerodynamic as possible to reduce the amount of power you?re wasting just pushing yourself through the air,? said aerospace engineering graduate student Benton Greene said. ?You want it to be streamlined and you want the surface to be smooth.?

The car gets its power from a flat array of solar cells that derive energy from the sun alone. This presents a challenge, Greene said, because there is a limit to how much power the car can receive.

?The array only gives you about 1,200 or 1,300 watts maximum power when the sun is directly overhead, which is less power than you have in your microwave,? he said. ?To be competitive your car has to run on that, and it has to go about 30 to 35 miles per hour on just the power it takes to run your microwave.?

TexSun?s energy is supplemented by a rechargeable battery pack, which cannot be recharged once the racing for the day has begun. Fred Engelkemeir, electrical engineering graduate student, said teams use various strategies to conserve their car?s battery life throughout the day, as well as use it to accelerate and improve their lap time.

?The reason for a battery pack, besides the obvious ? what do you do when it?s a cloudy day ? is that solar panels only put out a little over a kilowatt, which is about the power of a hairdryer,? Engelkemeir said. ?To accelerate takes a lot of power, so you basically accelerate with power from the batteries.?

From the car?s base to its software to its battery, UTSVT students break into sub-teams that focus on each aspect of the car and then put it all together to create a working vehicle.

?It?s a lot of work, but once I get to competition I?m so excited that I forget I?m tired,? Engelkemeir said. ?Even though we?re technically competing, it?s a pretty jovial competition. Teams will help each other out; of course we do all want to win.?

Electrical and computer engineering professor Gary Hallock has served as the team?s adviser for the past decade. The TexSun is the third solar car he?s been involved with.

?The team has been working night and day finishing the car,? he said. ?I am extremely proud of the students. Our entry will be very competitive and highlight what UT engineering students can accomplish.?

This event made possible by generous support from Circuit of the Americas, Nissan, Plantronics, Schlumberger, Sunpower, Texas Motor Sports, Texas Solar Energy Society, Lockeed Martin, Cirrus Logic and Alfe Heat Treating.

For additional information, visit UTSVT?s webpage [2] and the team?s Flickr slideshow [3].

Related Faculty:

Gary Hallock [4]

Electrical and Computer Engineering

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