Team Fast Forest

Quick as lightning - MSC Software supports ‘Team Fast Forest’ from Deggendorf

MSC Software is providing support to 26 teams in Germany, Austria and Switzerland with its simulation software MSC Nastran and Adams. One of these is the ‘Fast Forest Team’ from Deggendorf.

Young university students make use of Adams multi-body simulation software to construct a vehicle for entry in the Formula Student competition. ‘Team Fast Forest’ from Deggendorf is using the software to study tires and chassis. Breaking conventional car design, the team will focus on electric vehicles.

Focus on electric cars

Due to high fuel consumption and the increasing number of regulations aimed at urban driving, attention is now, more than ever, focused on electric cars. But concerns about fuel efficiency not only play a role in the design of larger vehicles; they are also a significant factor in the Formula Student competitions. Titus Meier-Kraut, technical director for ‘Team Fast Forest’ from Deggendorf, reports on his experiences with Formula Student.
The formula student contest

Formula Student is a contest in which university students construct a single-seat formula racing car. It’s not the fastest car that wins, however, but rather the team that racks up the highest overall score across a range of categories: design, financial planning and sales strategy. Formula Student was initially launched in the US in 1981. Starting in 2006, students have been allowed to participate at the Hockenheimring in Germany. In all, 346 teams from 50 countries around the world take part in developing cars for the competition.

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Mr. Meier-Kraut has been studying mechanical engineering at Deggendorf University, where he is currently completing his Bachelor thesis. To him, the most important thing about Formula Student is that it allows him to apply the experiences he has learned at the university to designing vehicles. “Formula Student is a great introduction to a professional career and to everyday work life. You’re dealing with things that a technician normally doesn’t deal with, like cost planning. So it’s extremely important that we keep an eye on inputs and outflows,” says Meier-Kraut.

“In Formula Student, you learn how to handle stress and work as part of a team. It’s often the case that the car decides not to start right before the competition begins – and you have no idea why. That’s when you really need to be able to keep calm and think everything through carefully so you can figure out where the problem lies. ‘Team Fast Forest’ is made up of nearly 70 students from various fields of study. Most of its members are studying mechanical or electrical engineering, but there are also some in the team who are majoring in business administration and media technology. Members are divided into various groups focusing on production, management and batteries, in order to make the project as successful as possible. The team’s greatest achievement to date came when they placed 9th in the Formula Student competition held at the Hockenheimring last year.

Electric model for car design

Team Fast Forest has now switched over completely to an electric model for the design of its car. During the first three seasons that they took part in the contest, the team concentrated on combustion engines, or combustion engines combined with electric engines. But owing to time and money constraints, they have now decided to switch over entirely to electric-powered cars. They recognized the potential it presented and have not been disappointed by the response.

“A number of companies have shown an interest in the new design and were quick to provide support in the form of both materials and know-how,” says Meier-Kraut. Formula Student Electric (FSE) allows the use of all types of rechargeable batteries and condensers as energy storage devices, but does not permit high-temperature batteries or fuel cells. FSE has been part of Formula Student for only the last five years, so new teams have had an opportunity to demonstrate their skills at innovation.
Simulating mechanical systems with confidence

In designing and building their car, the students made use of the multi-body simulator Adams from MSC to help them develop the best chassis possible. Adams stands for Automatic Dynamic Analysis of Mechanical Systems. It’s the most frequently used software for simulating mechanical systems and provides analysis of three-dimensional motion dynamics in mechanical systems under realistic conditions, factoring in all physical interactions. Adams integrates elastic components via flexible bodies and takes into consideration friction as well as complex contact interactions. Tire behavior and complex road profiles can also be studied using multi-body simulation in order to save on time and expenses. Vehicles designed for Formula Student can reach speeds between 80 and 100 km/h on straightaways.

The teams are sponsored by a variety of different companies, as well as by the city of Deggendorf and the university itself. The dedicated young students have made optimum use of the materials they were provided with to build the vehicle.

“We appreciate what our sponsors have done for us. Without their help, we’d never be able get the project off the ground. And the contacts we make with the sponsors are also helpful in finding internships and in getting started in a career,” Meier-Kraut points out.

Going forward

For 2014, the team is eager to show that they can build a reliable vehicle in their sixth season of participating in Formula Student. They hope to be among the top six teams at Hockenheim. Along with the event in Germany, the team will also be participating in competitions in Austria and Spain.

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Titus Meier-Kraut, Technical Director for ‘Team Fast Forest’ from Deggendorf
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