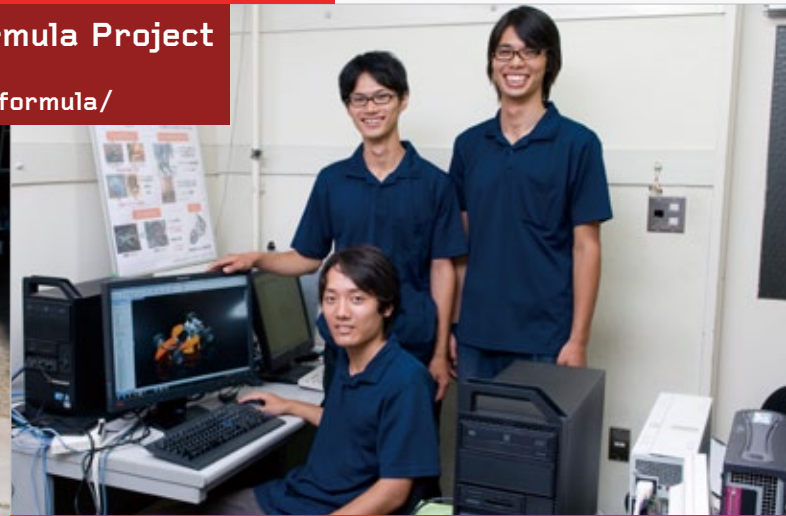


FORMULA CAR DEVELOPMENT TEAM RELIES ON LENOVO THINKSTATIONS AND SOLIDWORKS FOR 3D CAD AND ANALYSIS

Osaka City University Formula Project

Established: 2004

URL: <http://www.osaka-cu.com/formula/>



Osaka City University Formula Project

2011 Project Leader

Yusuke Hatano (pictured upper left)

2012 Project Leader

Shingo Hayashi (pictured upper right)

Chassis Team Suspension Manager

Sho Nakajima (pictured lower left)



OSAKA CITY-UNIVERSITY
FORMULA PROJECT

The Osaka City University Formula Project, Established for Participation in the Student Formula SAE Competition of Japan

The Osaka City University Formula Project is a club at Osaka City University formed for the purpose of participating in the Student Formula SAE Competition of Japan sponsored by the Society of Automotive Engineers of Japan. The Project debuted at the 4th annual competition and has participated in every following year's competition (with the exception of 2009). The team won 1st Place for rookies at the 4th annual competition, with cumulative points placing it 16th out of 50 participating schools. After winning 2nd Place for acceleration at the 5th annual competition, the club is showing solid results.

The reasons that key members Nakajima, Hatano, and Hayashi joined this Project are varied, but they have one point in common: "We like cars, and we like building things." The reason the Society of Automotive Engineers launched the Student Formula SAE Competition of Japan was "with the aim to foster engineers brimming with creativity, through creating an environment in which they can experience the difficulty, fun, and joy of building things." It could be said that the project members fully embody that goal.

Development of a New Vehicle in Pursuit of Cornering Performance

For the 9th Competition that was held in September 2011, the Project developed a new vehicle, which was model No. 6. "The concept for the development of No. 6 was the pursuit of cornering performance. We designed with consideration of deceleration before the corner, turning, and escape-time acceleration, and designed it with a focus on overall balance" states Yosuke Hatano, 2012 project lead. Specifically, they say they designed the suspension so that the tires are always perpendicular to the ground, and made the engine intake and exhaust systems themselves so that the power characteristics would be easy to handle for escape-time acceleration.

Additionally, they diverted a motorcycle engine (600 cc) for the vehicle engine, but since they are required to mount a restrictor to limit intake, the output is suppressed.

SOLIDWORKS FOR 3D DESIGN AND ANALYSIS

In the production of a formula car, it is essential not only to use 3D CAD to carry out mechanical design, but also to perform simulations and analysis. SolidWorks is a comprehensive tool that allows not only 3D CAD, but also simulation and analysis. That a low-cost student license is available is another part of its appeal. The tutorial is substantial as well, and very popular with students, as it allows mastery of the operations through self-study.

SolidWorks runs even on a normal PC, but to conduct high-load work like analysis, a workstation with sufficient performance becomes necessary. The high-performance, highly reliable Lenovo ThinkStation is a perfect platform to run SolidWorks.



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Although Unable to Reach Goal of Completing All Events, There Were Definite Returns

The goal for the 9th annual competition was to "complete all the events." The Osaka City University team participated in all three static competition events, and recorded solid results in the 10th to 20th place range for each. In the dynamic competition, four events are conducted in order: acceleration, skid pad, autocross, and endurance.

However, during the skid pad event, the clutch on the team's vehicle broke. "We ran it in the autocross with the broken clutch. However, since it would be impossible to do endurance in this condition, we replaced the clutch and were waiting for our entry. But we ran out of time and couldn't enter" says Hatano. However, the team recorded a strong finish of 8th place out of 75 teams in the acceleration event.

Using the 3D CAD SolidWorks to Design and Analyze a Formula Car

The team is using SolidWorks for the design and analysis of its formula cars. According to team member Sho Nakajima, "SolidWorks is convenient because it can do not only 3D CAD, but also strength analysis and fluid analysis". He mastered the program through self-study, but that once a year, the universities in the Kansai area jointly invite a SolidWorks representative and conduct a training session.

The activities of the project are supported by many businesses, and negotiating with the sponsors is another important task.

Great Improvement in Development Efficiency with Introduction of ThinkStation E Series

The team introduced Lenovo's entry-level workstation, the ThinkStation E Series and development efficiency improved significantly. Nakajima says he was surprised at its high performance. "Compared to a normal PC, the performance is completely different.

Running the full assembly of all the collected parts for the formula car on the PC we were using up to this point would make it perform extremely slowly, but with ThinkStation E Series it runs comfortably." That it has the stability not to freeze even when subjected to prolonged loads is another part of ThinkStation's appeal.

In ThinkStation E30, the performance is even more improved, and it completes analysis in a shorter amount of time. On the PC before, even if we started analysis in the morning it would take until evening, and it would freeze partway through again and again, so that if it analyzed once in one week it was doing well. However, the ThinkStation E30 can reliably complete analysis several times in one day.

"We also appreciate that the operating noise is quiet", says Hayashi. There are also many members who enjoy Lenovo's laptop PC ThinkPad. They have chosen the ThinkPad because "when compared to other companies' products, it operates at a high speed, and also has high stability."

Lenovo Workstation Supports Improvement in Japan's Technological Capabilities

Hatano describes his experience on the Project in the following way. "At school, there weren't many classes where we could actually make things, so it was a really big deal that in this Project, by carrying out the sequence from design to production, we learned the flow of testing and sending feedback to design again. I was even able to have the valuable experience of bringing the team together as a leader."

The Lenovo workstation is supporting activities like these, which lead to the improvement of Japan's technological capabilities.

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