

CASE STUDY

NUS Formula SAE

Singapore | Automotive



Formula SAE is a design competition for university students, organized by SAE international since 1978. NUS Formula SAE has been building a high-performance race car yearly since 2003 for the competition in Michigan.

THE CHALLENGES:

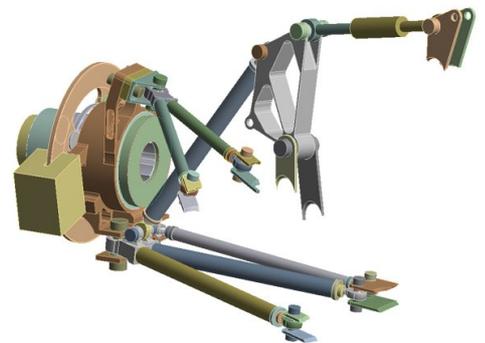
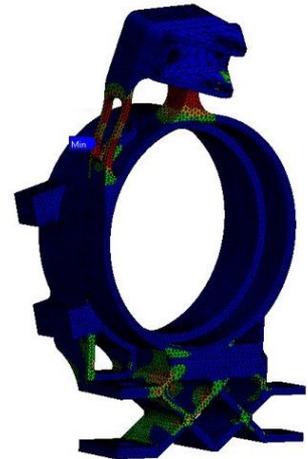
In the past we have used other simulation software to design our parts. However, there are several occasions where the parts fail despite having validated with FEA from other stress simulation software. The lack of specific customizations in other software to accurately define our components was the reason for this.

THE SOLUTIONS:

We have switched to ANSYS for our FEA instead and it allows us to study the structural integrity of our components accurately. We can properly dimension our materials and attribute them with highly specific mechanical properties that aid in narrowing the gap between real world and simulated results. Post processing of completed simulations are also thorough and comprehensive. The intuitiveness of ANSYS complements the level of work done to ensure a structurally sound race car.

THE RESULT & WHY WITH CAD-IT & ANSYS:

ANSYS has enabled us to do complex system FEA simulation on a system level. This allows us to gain deeper insights to how the parts work and interact as a system. With great Technical advises from CAD-IT, the in-depth set up features along with multi layered post processing options allows us to negate time wasted due to practical testing. We also do not have the need to validate simulation results providing more time for focus on other aspects, such as systems in



+65 6508 7575

marketing@caditglobal.com / sales@caditglobal.com

Anslys / ELITE CHANNEL PARTNER

CASE STUDY

NUS Formula SAE

Singapore | Automotive

CUSTOMER

NUS Formula SAE participates in the Formula SAE Event in Michigan, USA yearly. The competition challenges teams of university undergraduates and graduate students to conceive, design, fabricate and compete with small, formula style, autocross race cars. The competition places great importance on design, and cars must be carefully planned which consists of statics and dynamics of events. Static events require the team to be innovative and come up with unique design choices to gain additional points, but the focus remains on functionality to allow the car to perform properly in dynamic race events.

TESTIMONIAL

Due to the intensity at which the car runs at, many of our car components undergo high loads and stresses. Several components have broken down in the past, due to a lack of proper force analyses. When parts get broken during our test runs, it not only puts the driver's safety at risk but also disrupts our testing phase which gives us more data on how to tune the car better to perform better in the competition. With the implementation of ANSYS and assistance from the CAD-IT Team, we can run a more accurate simulation that reflects the real-world load cases better. At the same time, we can run larger systems with more dynamic and static parts together, a significant difference compared to past used software and testing methods. This allows us to not only run a more accurate simulation, but it also allows us to save time by running a system-level large-scale simulation.

METRICS BASED ON CAD-IT SOLUTION

With simulations done with Ansys, we are able to reduce about 40% of weight from our components, each year we are steadily able to reduce about 3kg of weight from our cars via topology optimization. Not only this, but we are also able to work with a significantly smaller safety factor since our ANSYS models have now been optimized over the years to accurately reflect real-world results. This means that we do not have to over-engineer components to compensate for structural integrity due to differences between real-world and simulated results, saving a tremendous amount of weight and space. As a result, we can test our cars more vigorously to get better timings and build faster cars to win the competition.

CONNECT WITH US TODAY!



+65 6508 7575

marketing@caditglobal.com / sales@caditglobal.com

