The Open University

Finite Element Analysis

This is Formula 1!

Formula 1 motor racing is a multi-billion dollar, high technology and highly competitive professional sport. In many ways at the leading edge of car design - be it aerodynamics, electronics, materials engineering, and so on.

The very best drivers compete on a world stage in races where vital fractions of a second mean the difference between winning and losing.

And it is not just the drivers. Enormous effort goes into the design, manufacture and testing of a racing car and all its components and systems - to gain those fractions of a second. The very latest tools and equipment are called upon to create the engineering components - usually with a rapid turnaround time and short production cycle.
A modern formula one car then is an ideal example to show Engineering at its best.
During this study we are going to take a look behind the scenes to see how one team - Red Bull Racing, use finite element analysis when designing their Formula 1 cars.
Red Bull use the MSC system for all their computer aided analysis and design. For example, Patran for pre and post-processing, and Nastran for the analysis.

For our two case studies, we're going to look at the design and stress analysis of 2 parts of the car - the wheel hub and the tub or chassis.