

CFX the key to solar car design

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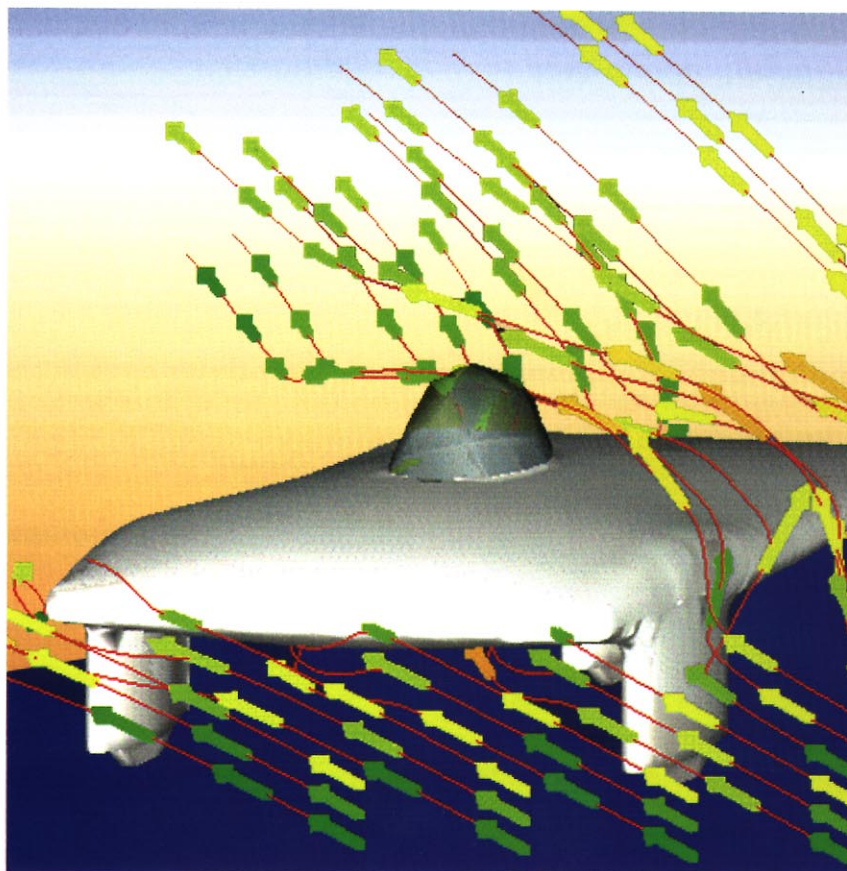
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IMAGINE TRAVELLING 1,980 kilometres without a single drop of fuel. That's what over 1,000 students from across North America attempt to do every two years in 'Sunrayce', the cross-country competition for solar-powered vehicles. In 1997, one of the cars in the race from Indianapolis to Colorado Springs was 'Midnight Sun IV', designed and built by a team from the University of Waterloo (U of W).

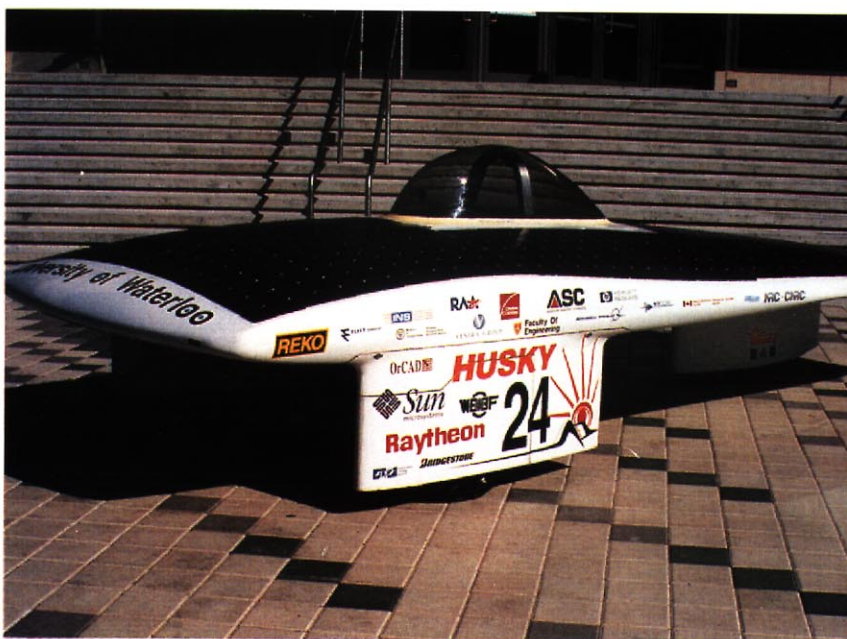
The U of W team recognized that to be competitive, their car had to be close to aerodynamically perfect, since drag accounts for approximately two thirds of the power consumption of a competitive solar car. Short of time, they used CFX to optimize the aerodynamics of the design without spending valuable resources and time building and testing wind tunnel models. Once happy with the aerodynamics, the team virtually assembled the car at the design stage using SDR I-DEAS, eliminating the post production debugging that most prototype vehicles require. The whole development process was further accelerated by using the same solid model, from the analysis stage right through to the manufacture.

The car was completed less than 24 hours before it had to be at the General Motors Proving Grounds in Michigan to participate in scrutineering and to qualify for the race. The untested car ran flawlessly and became one of the favorites. In the race itself, the car performed very well and by the sixth day, was in first place with an average speed of almost 65km/hr. And it would have remained there had it not lost two motor controllers in the next two days, costing it five hours and pushing it down to seventh.

Despite this let-down, the 'Midnight Sun IV' team was presented with the 'Technical Innovation Award for Outstanding Mechanical Design and Overall Mechanical Systems'.



Flow prediction around the solar car



The Midnight Sun IV car