FACHHOCHSCHULE TRIER
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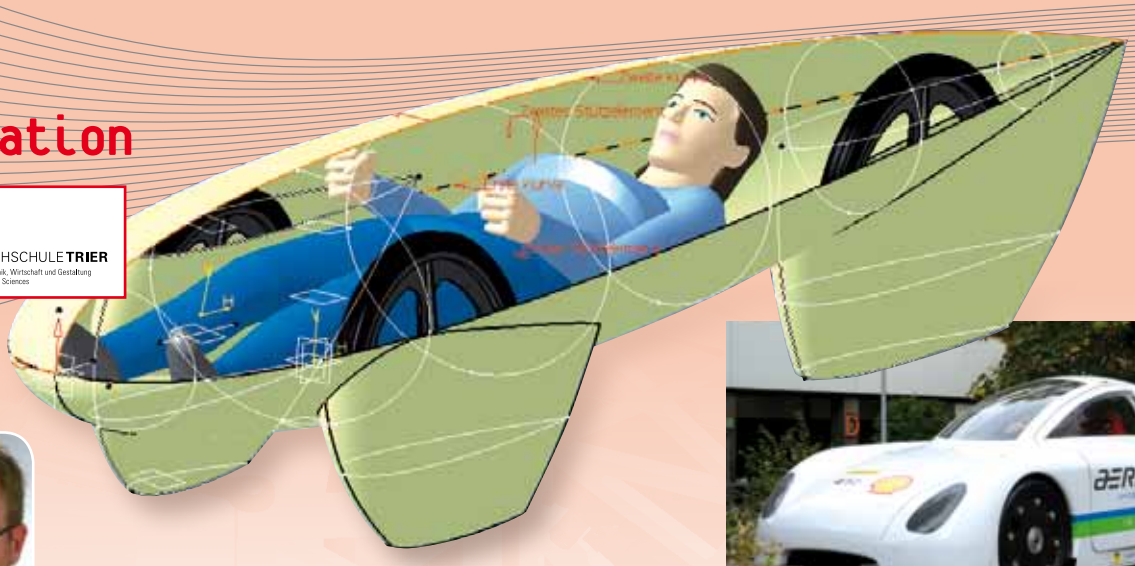
University of Applied Sciences



proTron: Surface construction of the skin in CATIA GSD

Michael Hoffman
Trier University

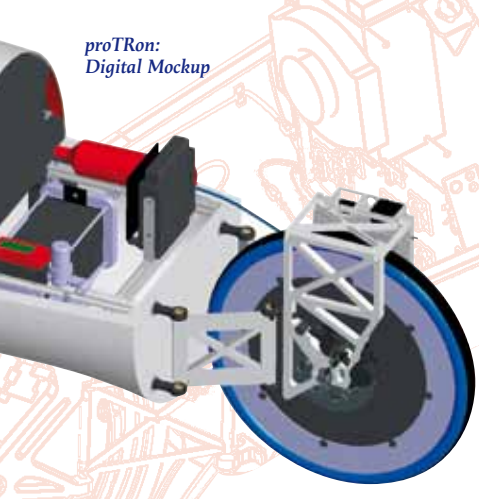
AERIS: driving test on FH Trier campus

CATIA makes it possible to operate using a common database without interfaces, from the ergonomic study, through calculation and optimization, to NC simulation and machining.

» the car, the higher the probability of failure. The easiest way to make the vehicle fail-safe is to eliminate any dispensable components."

TRIER TEAM SHINES IN SHELL ECO-MARATHON

In fact, eliminating dispensable vehicle parts is one of the most important tasks for the teams taking part in the Shell Eco-marathon. The basic aim of this "green" competition is to design the vehicle that can travel the furthest distance on the equivalent of one liter of gas.



proTRon:
Digital Mockup

The current record, held by the Science and Technology University of Zurich, is 3,836 km.

Two classes of vehicles are assessed: the highly efficient prototype class and the urban concept category, in which roadworthiness is a criterion. The 197 teams lined up at the start of the 2009 Lausitzring included 18 German teams, the best of which was Trier University of Applied Sciences whose proTRon II vehicle came in fourth at 3,178 km. Their AERIS, developed in eight months competed for the first time and won the Design Award in the Urban Concept category.

AIRSTREAM AND TOPOLOGY OPTIMIZATION WITH CATIA

Although no vehicle travels faster than 30 km/h in the Eco-marathon, vehicle aerodynamics is of great importance. Airstream optimization integrated into CATIA was therefore included even in the early proTRon II and AERIS design phases. To keep the weight of eco-vehicles as low as possible, the students added a self-supporting carbon-fiber body and topology optimization. The result: proTRon II weighs just 50 kg, while AERIS is 110 kg. In both vehicles, a single fuel cell drives two electric motors, one to start with the necessary torque and the other for constant speed. The Trier team also attached great importance to the best ergonomic design for the driver's position, using CATIA human builder: the proTRon II driver was measured and the car actually built around her. The students also designed AERIS in such a way that the 1.80m-tall driver has enough room. CAD/CAM Instructor Michael Hoffman, who supervised the proTRon and AERIS teams' PLM and IT operations in 2009, said of the tools: "We've benefited hugely from the consistency of CATIA, given that we are using several tools. CATIA makes it possible to operate using a common database without interfaces, from the ergonomic study, through calculation and optimization, to NC simulation and machining." Given the short development cycles, it is also important that the SER team of some 30 CATIA users work in concurrent engineering. To enable this, the Trier team used ENOVIA SmarTeam for access to product data and release management.

This year will be no different. In 2010, between Dassault Systèmes software and a great deal of creativity and commitment, the students will try to have the proTRon break the record and beat the 4,000 km target •)

For more information:
www.racing.tuwien.ac.at
www.whz-racingteam.de
www.protron.fh-trier.de