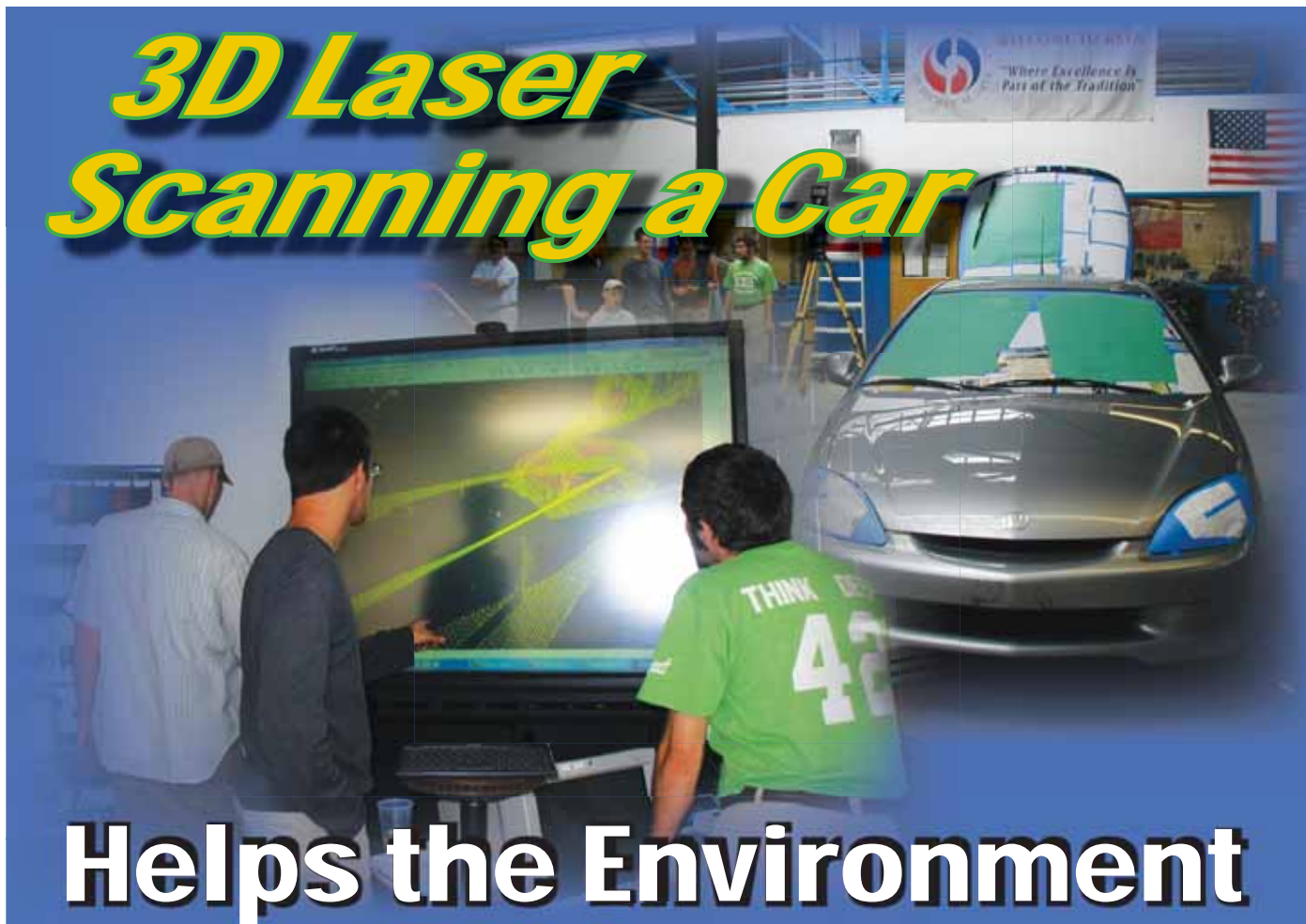


3D Laser Scanning a Car



Helps the Environment

*Background: Led by Dan MacIsaac, PLS, the team sets up for the first scan of the morning.
Foreground: The engineering team looks at scan data as it comes in.*

Michael Feldman

Many people perceive today's land surveyors as professionals who provide plans to enable landowners to develop land. How about the concept of using new survey technology to perform a 3D laser scan to help the environment? Harry R. Feldman, Inc., a 30-member, 60-year-old, professional land surveying firm in Boston, Massachusetts recently accomplished just that in conjunction with the International Vehicle Summit held at the Massachusetts Institute of Technology (MIT).

Beginning on June 13, 60 student engineers representing 15 countries and six continents gathered at MIT to form a multi-university collaborative to work with industry leaders and faculty to rethink the automotive industry. These participants were chosen based on their previous experi-

ence with vehicles, particularly in the World Solar Challenge, the American Solar Challenge (ASC), Formula SAE, SAE MiniBaja, and Human Powered Vehicle competitions.

The vehicles that come out of this think-and-do tank will be propelled by human-solar integrated systems, fuel cells, biofuels, and biomimetic photovoltaics. Whether the focus is on motor design, aerodynamics, propulsion, or composite materials, emphasis will be placed on the cutting-edge nature of the students' R&D as they strive for breakthroughs in systems integration and component manufacture. They were divided into five groups that will work on five different options. Together, these vehicles will do something that the tractor-trailers and fleets of SUVs currently used to accompany solar racecars fail to do. They will demonstrate the self-sufficient, reliable, and robust nature of an aerodynamic, ultra light hybridized automobile design.

Two students from the retrofit team,

one from MIT and one from the University of Twente in The Netherlands, contacted us. They were both very enthusiastic about the goals of their project, and they wanted our help. Their team's goal: take an existing Honda Insight, remove the engine, and replace it with an electric motor. They also planned on removing the body of the car and replacing it with composite materials such as carbon fibers and Kevlar to make the vehicle lighter. "The reason they needed us to perform a 3D laser scan of the car was so they



Honda Insight image - scan cloud after all scans were registered.



FEATURE

could import a very precise, 3D model into their software to develop a more aerodynamic design for the new retrofit," states Dan MacIsaac, PLS, one of Boston's first users of the scanning technology for high definition survey.

Harry R. Feldman, Inc.'s 3D laser scanning team went to the shop at MIT in the morning and performed six scans of 1/4-inch density for the project. Total scanning time ran about four hours and post-processing about six hours. They set four targets around the vehicle and scanned all four from every scan station to ensure a tight control network. "We obtained most of our data from four main scans," states Arnold Ross, who was running the laptop and registering the scans during the morning. "We needed two extra scans to fill in a few holes that resulted from a low angle of incidence between the laser and the car." The final product included a 3D mesh of the vehicle that was sent to the team for their analysis and design.

This was truly a feel-good project for our firm. We were able to use our new technology for a project that could not have been done any other way, and we helped a group of young, brilliant students who are our world's future regarding innovative design. We are proud to be affiliated with such cutting-edge engineers who are working to create fuel alternatives that promote a more sustainable environment. †

For more information about the Vehicle Design Summit, visit www.vehicledesignsummit.org.

Michael Feldman is president of Harry R. Feldman, Inc.

feel good project



Michael Feldman speaks with a student from Taiwan in charge or writing code for her team.

brilliant students



Arnold Ross from Harry R. Feldman, Inc. and student Rob Reilink from the Netherlands begin the first scan.

think-and-do



The team tapes up the windows to ensure a reflective surface for the laser.