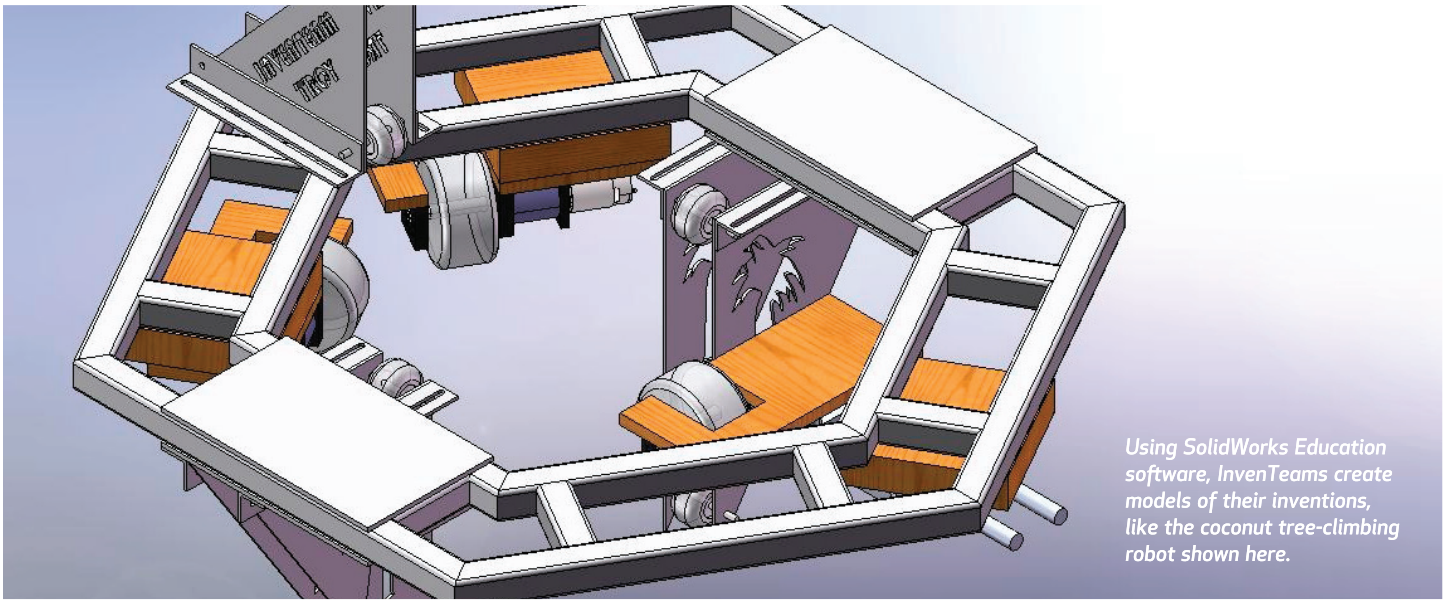
LEMELSON-MIT PROGRAM

Sparking the power of invention to solve real challenges with SolidWorks software



Using SolidWorks Education software, InvenTeams create models of their inventions, like the coconut tree-climbing robot shown here.

"Necessity is the mother of invention." – Plato, The Republic

The Lemelson-MIT Program has embraced the fundamental truth of Greek philosopher Plato's phrase as the foundation of its InvenTeam Program, which provides grants of up to $10,000 to high school teams from across the United States. Funded by the Lemelson Foundation and administered by the Massachusetts Institute of Technology (MIT)—one of the world's top technology universities—the Lemelson-MIT Program (LMIT) is dedicated to fostering inventiveness, encouraging innovation, and recognizing inventors. The Lemelson Foundation is part of the legacy of the late Jerome H. Lemelson, one of the twentieth century's five most prolific inventors with more than 600 patents.

Composed of high school students, teachers, and mentors, an InvenTeam collaboratively identifies a real-world problem, researches the problem, and then develops a prototype invention to solve the problem as an in-class or extracurricular project. To help InvenTeams achieve their goals, the Lemelson-MIT Program needed to partner with a technology company that could provide an easy-to-learn design solution, according to Invention Education Officer Leigh Estabrooks.

"A key characteristic of successful InvenTeams is the ability of team members to learn and efficiently apply design and engineering technologies to real-world challenges," Estabrooks explains. "We need to work with a CAD company whose software provides the necessary tutorials, learning aides, and ease of use for the team to quickly develop CAD skills. That way, they can spend more time tackling their real-world problems and engineering viable solutions."

The Lemelson-MIT Program chose to work with Dassault Systèmes SolidWorks Corp., which donates SolidWorks® Education Edition software to InvenTeam members. SolidWorks software was chosen due to several factors, including ease of use, widespread industry usage, and an existing company connection with the MIT 2.009 Product Engineering Processes course.

Challenge:

Provide InvenTeams with the advanced design technology required to quickly tackle problems while developing real-world skills and experience.

Solution:

Partner with Dassault Systèmes SolidWorks Corp. to provide InvenTeams with SolidWorks 3D design solutions because they accelerate design proficiency.

Results:

- Equipped InvenTeams with advanced design tools
- Shortened the CAD software-learning phase with SolidWorks software
- Provided valuable real-world skills and experience to students
- Connected local professionals as mentors to InvenTeams

SOLIDWORKS

Getting teams up to speed quickly

Because SolidWorks software is so user-friendly, it enables InvenTeams to compress their ramp-up time in terms of learning the CAD technology and applying it to solve real-world problems. This, in turn, maximizes the probability of their success while simultaneously building the CAD skills they will need to pursue future careers in engineering and technology.

"Fun is an important aspect of InvenTeams," Estabrooks stresses. "The students get a real kick out of creating 3D CAD models and designs, but the software has to be intuitive enough to keep them motivated and engaged. Many InvenTeams are working after school, so they need tools that are easy to use, and not intimidating. SolidWorks software has served the program well and provides an effective bridge for helping students make the journey from identifying a problem to creating a solution."

Reaching out to the SolidWorks Community

In addition to introducing students to 3D CAD technology, the relationship between the Lemelson-MIT InvenTeams Program and DS SolidWorks creates opportunities to connect with the extended SolidWorks Community—ranging from commercial companies and engineers, to software developers, professors, and researchers.

"DS SolidWorks takes its program sponsorship very seriously and has encouraged many of its customers and resellers to assist InvenTeams in their local area," Estabrooks notes. "The teacher's role is as a facilitator. Our teachers are primarily math and science teachers without CAD expertise, so the contributions provided by the SolidWorks Community—whether from the local manufacturer or CAD reseller—provide the support that teams need to remain energized and engaged in the program."

A coconut tree-climbing robot

One of the more interesting InvenTeam projects, developed by the Troy High School InvenTeam from Fullerton, California, involved the development of a coconut tree-climbing robot. The team used SolidWorks software to create a device that could climb a coconut tree and provide a single user interface for coconut harvesters, including a stable platform for future robotic attachments to perform tasks such as coconut harvesting, pesticide spraying, and pruning.

After learning how to use SolidWorks 3D CAD software, the Troy InvenTeam designed and built a remote-controlled coconut tree-climbing device that can ascend a 100-foot-tall tree that is 12 to 18 inches in diameter at a minimum speed of 33 feet per minute. Using SolidWorks software was an important key to the team's success. Their invention was later demonstrated at the Lemelson-MIT Program's 2008 EurekaFest celebration at MIT.

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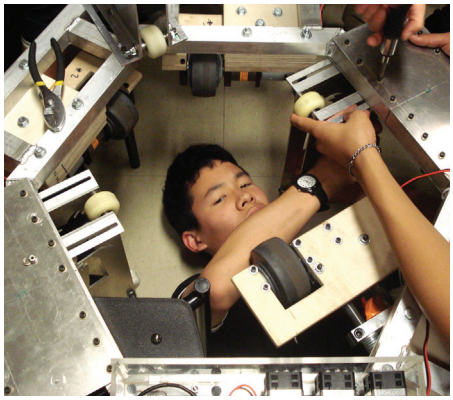
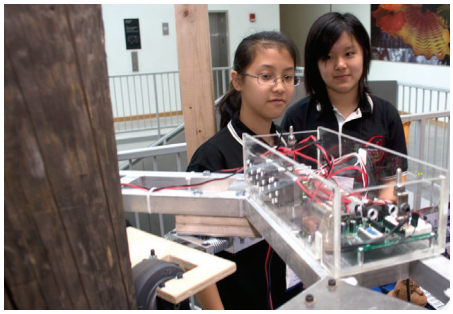
Education Officer





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LEMELSON-MIT InvenTeams
Inspiring a New Generation of Inventors

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