



Careers come FIRST

Photography by Adriana M. Groisman, courtesy of FIRST



Fun-filled FIRST
Robotics
Competition
encourages

careers in science, technology
and engineering.

by **Robert Sberna**

Combine the energy of a rock concert and the excitement of the final minutes of a championship sporting event, and you've got a fair idea of the atmosphere at a FIRST Robotics Competition.

Amidst pulsating music, frenzied fans and the play-by-play commentary of professional announcers, remote-controlled robots vie to complete tasks and score points in a series of fast-paced matches. The robots are designed and built by teams of high school students — with the assistance of educators and adult mentors from engineering and automotive firms and other industries.

Held each year at 29 regional sites throughout the country, the FIRST Robotics Competition was inaugurated 13 years ago by Dean Kamen, inventor of the Segway Human Transporter. Kamen founded FIRST, a nonprofit organization based in New Hampshire, in

1989 to motivate young people to explore career opportunities in science, technology and engineering. Along with the robotics competition, FIRST also oversees the FIRST LEGO® League for kids 9-14 years old,

and FIRST Place, a science and technology center that features an interactive children's science museum.

When he launched FIRST (For Inspiration and Recognition of Science and Technology), Kamen envisioned activities that would promote hands-on learning while fostering an atmosphere of team-building, entrepreneurship, sportsmanship and fun. Kamen also wanted to instill in kids an appreciation and respect for engineers that is ordinarily reserved for rock stars and sports heroes.

"FIRST helps kids discover the excitement and rewards of education and careers in science and technology," says Paul Gudonis, president of FIRST. "The FIRST teams are faced with challenges in design, engineering, fund-raising, communication, management and competition."

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- Paul Gudonis, president, FIRST

Noting that the competition is "never easy," Gudonis explains, "The participants come away with an understanding of the real-world engineering experience and confidence in their ability to solve tough challenges. It's the hardest fun they'll ever have."

Each January, FIRST provides participating teams with a robot kit that includes batteries, a variety of motors, gears, pneumatic cylinders, hoses, a compressor, wiring and control joysticks. The teams have six weeks to build their robot, which can weigh no more than 130 pounds and

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have a maximum height of five feet.

The challenge for the students and their mentors is to configure their robot for a specific kind of game, which changes each year. This year's game, Triple Play, includes elements of soccer and tic-tac-toe. The robots race around a 57-by-24-foot field picking up tetras, which are basically tubular pyramids, and stacking them on goals. Extra points are earned for putting tetras on three goals in a row. During the matches, which feature two three-team alliances, the robots may engage in defensive strategies.

Teams compete in regional contests in March, with winners advancing to the championship event in April. More than 30,000 high school students on 1,000 teams competed in this year's regional events, which attracted participants from almost every state in the U.S., as well as Canada, Brazil, Ecuador, Israel, Mexico and the United Kingdom.

At each regional event, trophies are awarded for highest point totals, robot design, engineering inspiration, safety and sportsmanship. In addition, FIRST participants are eligible for more than \$8 million in educational scholarships from some of the most prestigious science and engineering colleges in the nation.

While the matches are spirited and often intense, the defining aspect of the competition is the level of work ethic and gracious professionalism exhibited by contestants. As such, the most prestigious prize at regionals and the championship is the Chairman's Award, which is presented to the team that is judged to have best demonstrated student-mentor partnership and the FIRST principle of "competitive cooperation."

At the start of the Buckeye Regional competition held at Cleveland State University, high-spirited kids — some sporting wigs or spray-painted hair to match their team's colors — cheered and danced in the stands. In the curtained-off "pit" area, Michelle Ward and her Delphi ELITE teammates made last-minute adjustments to the electrical system of their robot,



With encouragement from a mentor, students participate in a FIRST Robotics Competition event.

Xtremachen 8. Delphi ELITE, all students at Warren G. Harding High School in Northeast Ohio, was one of 42 teams from 10 states competing in the two-day event.

"It's definitely a fun atmosphere," says Michelle, 15, a member of Delphi ELITE's electrical and control team, which is responsible for con-

figuring and troubleshooting components as well as creating the software programs that operate the computer. Delphi ELITE, like most other participants, also has teams that are responsible for design, build, competition, promotion, audio-visual and Web site operation.

"We have a diverse group on Delphi ELITE," says Michelle, who aspires to a modeling career after high school. "That's a good thing because it gives me an opportunity to interact with people who I typically wouldn't know in school. I've always been shy, but working alongside so many different people has helped me to open up."

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An essential aspect of the FIRST Robotics Competition is the partnerships created between teams and their corporate and private sponsors, which typically provide financial assistance as well as mentoring. Mark Baka, an industrial engineer at Delphi Packard Electrical Systems in Warren, Ohio, the primary sponsor of Delphi ELITE, says new mentors typically find that they are "hooked" after their first competition.

"There's a real satisfaction in watching the kids take on a project and learn from the hands-on experience," says Baka, a mentor since 1998. "I find it rewarding to help prepare the team members for college and possibly a career in engineering."

Estimating that about half of the 40 or so team members will go on to pursue engineering and technology careers, Baka notes, "The competition still benefits the kids that don't want to be engineers. I've seen kids turn their lives around because of this program. Some of the team members are here because they couldn't find any other interest in school. Actually, I've known of eight or nine kids who probably wouldn't have graduated from high school if they hadn't gotten involved in this robotics competition."

While youngsters are having fun building robots

and gaining experience in project management and problem-solving, their corporate sponsors view the FIRST Robotics Competition as a potential recruitment tool. "The kids gain valuable career skills, such as drafting, computer-aided design, automation and even video production," explains Lindsey Williams, media relations manager for Delphi, a Michigan-based supplier of mobile electronics, transportation components and systems technology.

"One of the things that Delphi prides itself on is leadership in technology," Williams says. "We have seen that one of the best ways to grow our technology base is through FIRST. The robotics competition makes technology and the learning of technology a fun experience. Sometimes, students learn better through hands-on experience, rather than classroom study. For some of these kids, building robots is fun; for others, it will turn into a career. This is a great program for enlarging the talent pool of tomorrow's scientists and engineers."

For more information about FIRST, visit www.usfirst.org.

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