Duct tape, Pumpkin and Apples bring robot to life

11/19/2009 by: Darleen Hartley - Get more from this author

The organization For Inspiration and Recognition of Science and Technology (FIRST), puts on an annual robotics competition. The goal is to involve youngsters in, yep that's right, science and technology. Competing teams receive nearly $10 million in scholarships from some of the best science and engineering schools in the country.

The non-profit organization's mission is to "engage children in programs that build science, engineering and technology skills, that inspire innovation, and that foster well-rounded life capabilities including self-confidence, communication, and leadership while practicing *Gracious Professionalism*. This means that all 1,700 teams expected to participate in 44 regions around the world are encouraged to compete like crazy, but to also help their opponents do well too.

FIRST whetted the imagination of one high school student, a spectator at last year's function, He was invigorated, and petitioned his school to enter this year's competition. As a rookie team, they have a long way to go. Beyond acquiring technical knowledge in a short period of time – the regional competition begins in March 2010 – a major challenge is funding.

If their creative marketing strategy carries over to their robot constructing ability, the Circuit Breakers Team made up of students from four schools, have a good chance in the competition. Coaxing a win out of a tough environment is traditional in their neck of the woods. El Dorado Union High School District sits in the middle of historic California '49er gold mining territory. More rural than cosmopolitan, resources are scant, but the inhabitants are resourceful by nature.

Led by instigator and team captain, Torgeir Lindborg, a sophomore at Union Mine High School, and inspired by Emma Holm, a freshman helping in public relations and fundraising, the students, to draw attention to their project, made a ***"mobile robot."*** "Bot 3189" as he is identified on his placard, was put together, you might say, with spit and glue.

The travelling goodwill ambassador, who appeared at an Apple Hill Autumn Festival was made from a plastic trash can. Flexible aluminum air ducting forms his legs and arms. A roof vent, light fixture, and screen for visibility comprise the head. Students take turns being the robot's innards, his CPU. The placard states his purpose – to raise funds for building the real robot for entry into the FIRST competition – and explains that putting money in the coin or bill slot will make the robot move.

Children were fascinated as they dropped cash through the slots which fell into a zip lock bag taped inside. On cue, the student inside Bot 3189 went into action causing the robot's cardboard-box feet to move in a robotic impression of Michael Jackson's moon walk. Adults laughed and pointed as

a young boy mimicked the moves, then asked his dad, who was eating apple pie, for more money to feed the robot.

A fair share of duct tape was involved in the mobile bot project, according to Charlotte Lindborg, Team Coordinator. However, the real thing will be built from true computer components, and other commercially available parts. Each team starts with the same Kit of Parts sans instructions, which they must purchase, in addition to paying the entry fee. They can add up to $3,000 more in parts to complete their project. The materials and design depend on which game their robot is assigned to.

Pumpkin, Inc., maker of the Cube Sat Satellite and its founder, Dr. Andrew E. Kalman, who leads the Space and Systems Development Lab at Stanford University, gave the team a $6,000 donation to cover initial fees. A Pumpkin aerospace engineer, Adam Reif, leads the build project, helping with mechanics and design. Two software engineers from the Intel Folsom campus, which is only 18 miles down the road, are coaching the students in programming, while two electrical engineers are lending their know-how. Volunteers abound, but as of this writing, the kids still need over $4,000 to meet expenses and participate in the competition. The El Dorado Union High School District is using PaySchools, an on-line payment processing system to garner donations for the Circuit Breakers robot project.

The planned robot will have both autonomous and remote control, should measure 4'x4' approximately, could reach 6' tall, and weigh about 150 pounds. No further blueprint can be laid out until FIRST announces the theme of the game on January 9, 2010. From there the kids must hustle to deliver their entry in only six weeks time from design, to build, through programming. The Circuit Breakers will participate in their regional event at the University of California at Davis come the end of spring next year.

Right now, they must hustle to raise thousands of dollars to to meet the expenses outlined on their website. Encouraging a future engineer or scientist takes caring, time, and money.

The highest award in the competition is not necessarily presented to the best robot developers, but rather to the team that has done the most to help other teams and promote *Gracious Professionalism*, a concept some of the more established technology companies might try practicing.