The Sprocket:
A Robotics Geared Newsletter

An Eden Prairie Robotics Production

www.team2502.com Volume 1 Issue 1 Wednesday, February 2nd 2011

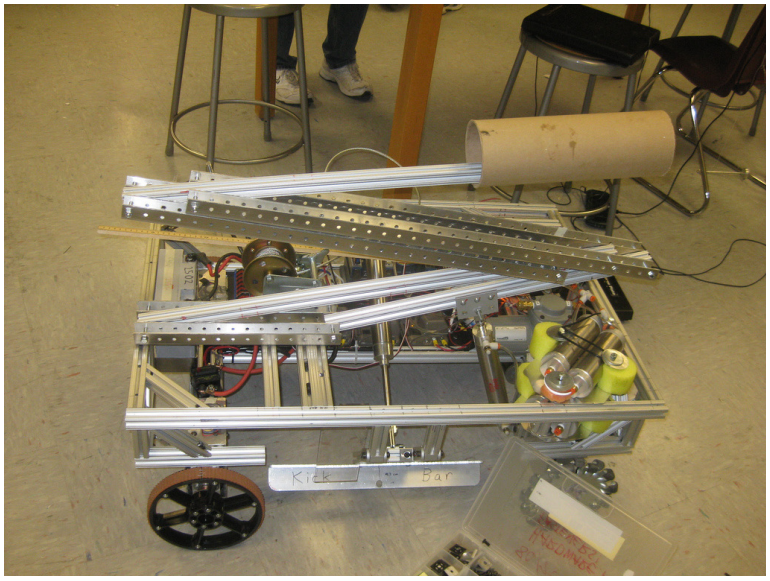
Eden Prairie Robotics Team 2502

The 2011 season of FIRST Robotics Competition (FRC) has officially begun! Eden Prairie High School's robotics team, Team 2502, has been participating in this competition since 2007. Team 2502 has seen success at these competitions, receiving awards such as the Best Website Award and the General Motors Industrial Design Award. The members, based on their knowledge or preference, are divided into three teams: building, programming, and marketing.

Members of the building team assemble all the components necessary for the robot to perform the necessary tasks for the game. Programmers must write code for the human operated period of the game, where a driver is controlling the robot to score points. In addition, programmers may write more code for the autonomous period of the game, where the robot must move without driver instruction to complete objectives for additional points. The electronics team bridges the gap between the build team and the programming team by wiring electrical components. The marketing team helps Team 2502 by getting sponsors, which allows for the team to continue making robots.

With the new season, FRC releases a game with completely new objectives and challenges. The teams are given 6 weeks to design and construct a robot to compete in the game. This year's game is called "Logomotion." The objective of the game is to place inflatable tubes onto a wall of pegs of varying heights. Robots are to travel across the field to grab new pieces and then back to place them onto the pegs. If the inflatable tubes are placed in the correct sequence, bonus points are awarded to teams. In the last 10 seconds the game, robots can deploy mini-bots onto towers located in the four quadrants of the field. Once they are in place, the mini-bots race to the top to earn bonus points.

If you are interested in joining Team 2502, look for us next year at the Activities Rush! No knowledge of robotics, programming, or marketing is necessary to join.



Team 2502's robot fom last year's game called "Breakway"
Photo by Keehun Nam

What Can I Do To Help Team 2502?

1. Come support us at the competition on March 31st to April 2nd at the Williams Arena on the University of Minnesota campus!
2. We are currently in the process of starting FIRST Lego League teams for Eden Prairie. You can help by mentoring kids in grades 4-8 that join, no experience is required! If interested, send an e-mail to mail@team2502.com

Flip over for technology news!

Technology News

Watson competes against Ken Jennings and Brad Rutter on Jeopardy every year from February 14-16.

Photo by Venturebeat.com

Iranian Nuclear Setback

Soldiers are typically seen as courageous men and women fighting on the front lines, but there are many soldiers who are doing so in the comfort of their own homes. Their biggest strike was in 2010, when a malicious computer software dubbed "Stuxnet" attacked a nuclear facility located in Natanz, Iran. Recent evidence has confirmed that the Iranian nuclear program has been set back by as many as three years. It is almost certain that the United States and Israel secretly collaborated to develop Stuxnet.

Stuxnet was designed to spread slowly and infect as few computers as possible. Stuxnet was deployed to a very specific region in Iran. Based on analysis of the underlying code, it most likely entered the facility via an infected flash drive, and once it infected a computer within the facility, it was also capable of spreading over the network that connected computers within the plant. After the code penetrated Natanz, it installed itself to the Programmable Logic Controller (PLC) after performing several complicated tests to ensure that it was in the Natanz system. It used the PLC to instruct the nuclear centrifuges to repeatedly speed up and slow down -- a very damaging process. At the same time, it projected a recording of standard system monitoring signals to the operators so that its dirty work went completely undetected. Some hypothesize that this went on for over a year before Iranian scientists realized what was going on.

The future of America might depend on highly skilled "computer fighters" to defend critical American computer systems. The head of the Department of Homeland Security's Cybersecurity Center called Stuxnet a "game changer." Stuxnet marks a new era: an era in which almost no computer-run system is safe. However, knowing this same virus could be generated by other countries, it is possible the U.S. is vulnerable to these attacks as well.

Computers battle Humans in Jeopardy

In the coming weeks, there will be a big day for robotics and artificial intelligence enthusiasts everywhere. Every year on February 14-16, a computer named Watson competes against contestants Brad Rutter and Ken Jennings on Jeopardy. Watson was developed by IBM and has already beaten both of his opponents in an impressive practice round.

Watson, named after IBM founder Thomas J. Watson, is an array of 90 servers, and has no connection to the Internet during competition. Instead, it has stored troves of information from thousands of encyclopedias, dictionaries, and news sources from the web. It even has every question and answer from Jeopardy's long-running history included in this system. The computer uses hundreds of ways to analyze the question and comes up with a range of solutions and ranks them on a confidence scale. If Watson is not confident about any of the answers, it chooses not to answer. When confident however, Watson buzzes in and gives the solution. After the competition, it goes online to learn more about that area and improve its knowledge.

According to an engineer from IBM, the majority of Watson's technology rests in its revolutionary language processing. He commented that IBM believes that one day everyone could have their own Watson in their pocket for multiple purposes. IBM says that Watson is just one of their many challenges that they dedicate themselves to solve, hoping that the solution will greatly impact society.

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