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Mrs. Beverly Fransen

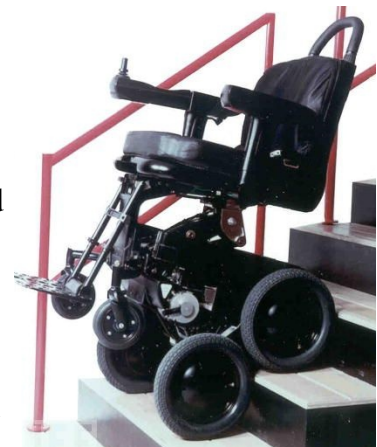
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The Fun and The Frustrating!

Zach Steiner

The music blares! The crowd roars! The competitors eagerly await the start...“Ta-da-da d-da! Charge!” And they're off! One competitor crashes into the wall while his handler hopes nothing is broken. Another competitor sits at the starting line, almost like he's asleep or didn't hear the buzzer. Two other competitors crash into each other, thankfully they are well padded. The last two competitors in this round perform beautifully! Zooming around the stalled and dazed opponents. “Buzz!” the round is over and they stop waiting for their handlers to come and lead them back to their pits. What are these competitors you ask? They aren't animals or humans, these are automatons...machines built to compete in a game we call “FIRST Robotics Competition”!

FIRST is an acronym which stands for For Inspiration and Recognition of Science and Technology. FIRST Robotics was developed by Dean Kamen and Dr. Woody Flowers about eighteen years ago. Who are these people? Dean Kamen is an inventor. He invented the Segway personal people mover, a wheelchair that walks upstairs as well as many other amazing things. Dr. Woody Flowers is a retired professor from MIT. When he worked at MIT, he found competition paired with gracious



*Illustration 1: Wheelchair
invented by Dean Kamen
www.life.com/image/16541
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professionalism created a positive and productive work/learning environment. Mr. Kamen and Dr. Flowers saw fewer and fewer new engineers and scientists entering college, the reason was is very few students found math and science fun. So they created the FIRST program to help make math and science fun.

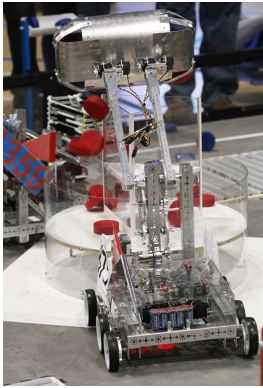
There are three branches of FIRST: FIRST Robotics Competition, FIRST Tech Challenge and FIRST LEGO League. FIRST Robotics Competition or FRC was the first program created. This program is for high school students with participants from all over the globe but it didn't start that big. In the beginning the competition was just 28 teams in a high school gym in New Hampshire. The FRC season runs from January through March with only six weeks to design, build, program and test your team's robot. This is six weeks of living, breathing, eating and sometimes sleeping robots! Since the beginning FRC has grown to regional competitions all over the world from Seattle, WA to Tel Aviv, Israel.



*Illustration 2: Bullbot's
2008/9 Robot photo Brenda
Burget*

FRC robots are big! For the last two years the robot's height and weight requirements were, the robot must be under five feet tall and weigh less than one hundred and twenty pounds without the batteries. Not only are these robots massive, but they are very expensive! FIRST estimates a FRC program will spend about twenty thousand dollars a year to fund a team. This does include traveling to a regional competition and the Championship. Many teams depend upon grants from NASA and other large companies and foundations. The team at Mountain View applies for grants, but they also have found a way to raise a large portion of their money by operating Robotic Summer Camps for elementary and middle schoolers in the Treasure Valley. Over the last two summers they have raised close to fifteen thousand dollars with their camps. The teens volunteer their time to staff and teach the campers how to build and program their robots in the Lego Mindstorms

environment, the same environment FIRST Lego League uses.



*Illustration 3: 2009
FTC Robot*
www.ll.mit.edu/outreach/RoboticsTeamsPhotos.html

The second program is FIRST Tech Challenge or FTC. The FTC robots use the TETRIX™ base set and the LEGO MINDSTORMS NXT set. These robots are about thirty-six inches tall and weigh under thirty pounds. FTC is probably the least known of the three programs but is steadily gaining interest because running an FTC team is much more economical, about three thousand dollars for a team for the first year and the teams can reuse many of the parts for subsequent years.

The season is longer lasting from October through March, and is a perfect FIRST program for a smaller high school or for a non school group, such as a scout troop or home schoolers.

FIRST LEGO League or FLL is for children nine to fourteen years old and uses the LEGO MINDSTORMS NXT kit. FLL celebrated it's eleventh season this year. FLL is exploding in the state of Idaho. Two years ago there were no teams in the Treasure Valley and this year fifty-three were registered. Across the state of Idaho more than two hundred teams were registerd. Teams came from after school programs, GATE classes, home schoolers, and neighborhood friends. FLL has a



*Illustration 4: Lego
Mindstorms Robot - photo
Suzie Steiner*

sub-branch called jrFLL and is for kids six to nine years old. These teams do not use the LEGO MINDSTORMS NXT robot, but they use basic LEGO parts to build something which demonstrates the yearly theme. FRC, FTC and FLL teams will all come together as part of the The Championship or Jamboree to be held in Atlanta, GA in April.

FIRST isn't just about building a robot. FIRST teaches teamwork, leadership and gracious

professionalism. During the robot build most teams break into sub-teams like programming, mechanical and electrical. Not only does FIRST promote team work in the sub-teams and these “team lead(er)s” need to communicate and work together so the robot is done with time to test and make adjustments. All teams are student lead organizations and most have a president, vice president, treasurer and secretary. Wood Flowers coined the phrase Gracious Professionalism, while he was teaching at MIT. Gracious Professionalism is the concept of being nice to those around you. Not only personally, but in the professional setting such as when a more senior person mentors a more junior employee or student and an environment where everyone is working toward the same goal. FIRST even has an award for Gracious Professionalism. Mountain View High School's team won the Gracious Professionalism Award at the 2009 Portland Regional Competition. The team had assisted several other teams both before and during the competition. The Bullbots helped one team finish building their robot, helped another team repair their robot's drive-train, the programmers helped another team debug a problem so their robot was more effective. While this seems like it could hurt a team to help repair another team's robot because these are your competitors, but not with FIRST. The FIRST 'game' or challenge randomly pairs three teams together to form an alliance and this alliance competes together for one round and the next round each team is grouped into a different alliance. So a team you competed against in the last round could be on your alliance this round. Grace Barnes, a parent of a Mountain View Robotics team member was overheard calling the Gracious Professionalism Award the “be nice to your neighbor award”.

Mountain View High School in Meridian has competed with FIRST Robotics for five years and Mr. Sherwood has been their coach the whole time. They were the first FIRST team in the Treasure Valley. Mountain View is team 1891 the “Bullbots”. Mr Sherwood is their coach and there are several people from the community who come and mentor the team. This year there are about 20 students on

the team coming from two different high schools in the Meridian District. Over the years there have been team members from each of the high schools in Meridian. I interviewed Mr. Sherwood about FIRST and here are some of the things he had to say about FIRST.

I asked, “How does FIRST compare to the 'normal' math, science and engineering classes taught at Mountain View?”

He said, “It doesn't. Nothing compares to the FIRST experience. A student can learn more in the six week build cycle than in the full four years of engineering classes.”

I then asked, “What has been your most memorable experience with FIRST?”

He said, “Pretty much every year. Watching the students learn. But, our first year our team making it to the Semi-final round at the competition in Portland was amazing!”

I then asked, “What does FIRST mean to you?”

Mr. Sherwood said, “All of the hands on work experience.”

I also interviewed Dean Klein, Vice President of Memory System Development at Micron and one of the mentors who has helped the Bullbots for three years now. I asked Mr. Klein, “What has been your most memorable experience with FIRST?”

Mr. Klein replied, “Every experience has been memorable one. A highlight for me was winning the Gracious Professionalism Award. Because, we had built a solid robot that never broke down, we were able to spend time helping other teams at the competition.”

I asked, “You are a mentor. What does being a mentor mean to you?”

Mr. Klein said, “Mentoring with FIRST is very hands on. It is a chance get into a project and work side by side with the students to find the solution. It is always exciting to see the way the

students solve problems.”

I also interviewed three students, Justin Ruebe, Eric Anderson and Derick Jensen. Eric and Justin are sophomores and have gone through a build season. Derick as a freshman is new to the team. I asked each of them similar questions.

I asked, “How has FIRST impacted you?”

Justin answered, “It has helped me do more than I normally would and it has helped me understand how things work. Not just put it together and hope it works.”

And Derick said, “It has made me smarter. FIRST Lego League last year helped me learn how to build things and program them.”

I asked, “What has been your most memorable experience with FIRST.”

Justin answered, “Everything we built was 'officially a prototype'. That was rather interesting”

And Eric said, “The competition in Portland. It was awesome to see all of the other team's ideas.”

I asked, “What would you suggest to someone who is looking at joining a FIRST team.”

Justin answered, “Definitely try it. Stick with it and don't just come to the first couple meetings in the year and then give up.”

And Derick said, “Do it! It's AWESOME!”

Now you probably wondering what the build season that has been mentioned is. The build usually starts on the first Saturday in January. The “Challenge” is revealed to all of the teams at the same time world wide so no one team has a time advantage. By doing this the game stays on an even playing field. After the kick off teams have to design, build and test their robots in just six weeks. From January

9, 2010 to the shipping date February 23rd. This is where the fun begins! Justin Ruebe had this to say about the build “It can be fun if every one is doing what they're supposed to and we're not stressing out”. But, one thing to keep in mind, the team is always stressing out. With deadlines looming, family or work obligations and this year, as well as every year Semester Finals falls right in the middle of the build season. The first thing teams do after the learning what the game will be at the kick off is brainstorm as many ideas as possible, just because its a weird idea doesn't mean it's a bad one. It can be very difficult and frustrating to brainstorm ideas and then have to cull out many of them until your team arrives with one or two ideas to focus on. Teams need to decide how they will score points. Will their robot focus on one aspect or will it do many things? In the 2008 season Over Drive a catapult robot seemed like an “impossible” idea but a team made it work and it was incredible to see that catapult send a forty inch diameter ball flying from one side of the field to the other. Another team chose to score points without needing to touch the ball and built had a small boat shaped robot that would weave in and out of traffic scoring points by zooming around the track as many times as possible. While Mountain View built a forklift robot that could pick up the ball and carry it around then lift the ball up and over the overpass. As the shipping date looms teams get stressed and frustration runs high. Team members have spent many hours together without enough sleep. Sometimes tempers flair. But in the end the teams crate up their robots and send the robots off to the competition.

Teams arrive at the competition Thursday morning to open up their crates and make sure their robots are still in one piece after shipping. If the robot hasn't been crated well it could have broken in transit. This happened to Mountain View a couple years ago. One of the parts for the pneumatic arm broke in transit. The team hadn't packed a spare! The team was frantically trying to locate a replacement when one of the other teams came over and gave the Bullbots one of their spare actuators, the part they needed! Their robot could compete and score points. The Bullbots were very relieved. Practice rounds

are on Thursday so teams have a chance to calibrate to the field, improve programs and the drivers are able to get a feel for the arena. The actual competition starts the next day after opening ceremonies. As I touched on earlier, with Gracious Professionalism, teams compete in alliances of three. There are two alliances on the field, the red alliance and the blue alliance. Some times a team will compete against a team in one round and be on the same alliance the next. Alliances are randomly selected until the championship rounds. In the championship rounds The top eight teams are the alliance captains the number one team has first pick and then it works down from there. The Championship rounds are populated with alliances the top seated eight teams choose. The teams are chosen by their records, ability to score points, and reliability. Between rounds teams have some time to fix and prepare their robots for the next round. After the the final round teams go back and clean up their pit area while the arena is set up for the closing ceremony. The closing ceremony is where the several different awards are given out including the regional champion and the Chairmans Award. The Chairmans Award is the highest award in FIRST and is about citizenship, teamwork and gracious professionalism not how well your robot did but how your team did. While there are frustrating moments, FIRST is a fantastic program full of fun!

FIRST is a robotics program not about making a robot but making the future!

Sources

FIRST <http://www.usfirst.org>

FIRST http://www.firstwiki.net/index.php/Main_Page

Interviews

Loid Sherwood Coach 1891

Dean Klein Mentor

Eric Anderson, Sophomore team 1891 programming sub-team

Justin Rueb, Sophomore team 1891 mechanical sub-team

Derick Jensen, Freshman team 1891 programming sub-team