

2008 FIRST Robotics Conference

Abstracts

3D Design Strategy, Tips and Relevant Internet Links

Bill Samuels, BAE Systems engineer

This session will provide design strategy and best practices for using Pro/Engineer software from engineers at BAE Systems who use it in their everyday jobs.

And what about minority kids?

Marian Prince, FLL2146 & 2147, SciMaTech – Hull Middle School

Mary Wilcox, FLL2146 & 2147, SciMaTech – Hull Middle School

When comparing our African American teams with mainly Caucasian teams, the achievement gap is evident. This is our second year of competing in the FLL. Even though we have had many obstacles, we have sparked the interest of a portion of our economically disadvantaged student body. Based on our limited experience, we know that we need to raise the knowledge level and the skills of our students. This is an interactive session. We will be sharing our experiences and will be asking for your input about what we could be doing and what we should avoid.

Animation: Ideation to Creation

Dan Ward, FRC45, Ivy Tech College

Luke Ward, FRC45, Ivy Tech College

Kyle Wiley, FRC45, Ivy Tech College

In this session, we will demonstrate the steps our team takes to produce a *FIRST* animation entry each year. We will begin by discussing the ideation phase of the animation, and how to get your ideas on paper. Detailed storyboarding of ideas along with discussions of timing, shot theory, and effects will be covered in detail. Lastly, we will discuss specific modeling details by focusing on turning 3D models into realistic mechanical animations. We will look at specific techniques for motion control, linkage processes to create object hierarchies, and some useful special effects. We will use examples from past year's animations too illustrate each of these features, and go through all of the steps our team has used to create winning *FIRST* animations.

The Baltimore Area Alliance (BAA) a Model for FIRST

Paul Harris, FRC1727, Baltimore Area Alliance

The Baltimore Area Alliance (BAA) was formed in 2006 and has 12 member teams sharing resources and involved in shared activities. This has been for the benefit of all teams in the BAA. The BAA has its own web site, its own technical forum, has sponsored an off-season event (the Battle O' Baltimore), which will become an annual event, and has put on formal education for all teams. The BAA also helps to sponsor a group wide fundraiser that benefits all teams. This presentation will share with the participants all information necessary to help attendees form their own alliances in their local areas.

The Benefits of the FLL Program for Children with Cancer

Jose Fernandez, Andres Bello University

We had been working with children with cancer inside hospitals for three years and the last one we worked with the FLL program. The benefits are so many that we would like to present them to all *FIRST* Community. It is a great opportunity to help kids to build robust self-esteem and to help kids with cancer to get better health.

Blogs, Podcasts, and Community Service: Extending the FLL Theme Beyond Competition

Taylor, Kayla, Victoria, Jenna, Erin, Ebony, Lantz, Shakir, Carl, and Kevin

Eagle Explosion, FLL 6406, NASA AEL/St. Elthelreda School/Chicago Public Schools

The research project is an important part of the FLL challenge each year and helps teams learn about technologies, information and everyday events that will affect us today as well as in the future. Teams 6406, 6795, 6597, and 5759 have combined our ideas from our research on energy during this year's Power Puzzle Challenge and created a city-wide/global community awareness outreach program that includes ideas from each team's project and is a public service outreach that showcases the benefits of FLL to our community. Our combined projects will keep the excitement of FLL going beyond the end of the competition season and we have members of each team working together in the spirit of gracious professionalism. Project ideas that will be presented include: 1. Team 6406's Blog eagleexplosionenergysavers.blogspot.com, 2. Community service project (All Teams)– Display of teamwork and research posters at local Home Depot stores during distribution of literature on CFL bulbs to shoppers. 3. FLL Podcasts created by members of all teams 4. Distance Learning Videoconference –Team-wide participation in FLL workshop in February on robots, research projects and experiences working as a team during the 2007 FLL competition hosted by the Museum of Science and Industry. 5. FLL presentations to local school councils, Aldermanic ward meetings, church groups, and special events hosted through the NASA AEL program in Chicago. As rookie teams working together strengthened us all and we look forward to sharing our experiences and ideas with other FLL teams everywhere.

Building and Sustaining a Community Robotics Program

John Pilvines, FTC001, Sharon Youth Robotics Association

The presentation "Building and Sustaining a Community Robotics Program – a Case Study" is based on our experiences creating and building the Sharon Youth Robotics Association. Our original and continuing focus HAS BEEN the *FIRST* LEGO League since the first season, and we are currently fielding seven teams. We were also fortunate enough to get involved with the *FIRST* Vex Challenge in its demo season, and have expanded to three teams. We will cover what we consider to be the critical issues for program success - community vs. school organization, meeting location(s), development of capable volunteers, teams recruitment, team and program funding, team training, regular association meetings, small competition(s) and scrimmages, etc. One of our most important initiatives has been the development of student mentors that have graduated from the FLL to the FTC program, and now work with the FLL teams on a regular basis.

Chairman's Award Preparation - Almost As Fun As Building a Robot!

John Larock, FRC365, DuPont

Linda Grusenmeyer, FRC365

Sharon Rybarczyk, FRC111

Walt Hickok, FRC67

Robert Janke, FRC254

Cathy Beck, FRC103

Kick your Chairman's Award submission into OVERDRIVE!

The Chairman's Award is the top award in *FIRST* FRC and is more competitive than ever each year. MOE 365 would like to share our Chairman's Award experience with teams. The presentation will cover the following topics: why submit? - know your team - how to plan - the written submission – the judges presentation. We will also have on hand a panel of Chairman's Award All-Stars from past Chairman's Award-winning teams. Chairman's All Stars include Sharon Rybarczyk, Team 111 (WildStang), Walt Hickok, Team 67 (HOT), Robert Janke, Team 254 (Cheesy Poofs), and Cathy Beck, Team 103 (Cybersonics). The panel will take questions from the audience.

Cooperation

Dan Barry, former NASA Astronaut

No abstract provided.

Designing Competitive Manipulators: The Mechanics and Strategy

Greg Needel

This presentation will cover basic topics for how to build and design functional and successful manipulators for *FIRST* competition robots. The main topics that will be covered in the presentation are mechanics, design, implementation, using the KOP, and good design practice. Under mechanics I will be covering basic calculations that are required, including strength of materials, torque, and mechanical advantage. In the design section of the presentation I will be showing examples of different arm designs and mechanisms. Implementation will discuss different ways of using the arm designs to accomplish the goal of the game. Using the Kit of Parts will reveal different options on running the manipulators; pneumatics vs. motors, off the shelf components, etc. Finally I will be touching on designing within your capabilities covering topics such as using the tools available, material selection and KISS method.

Effective Strategies for FRC Robots

Karthik Kanagasabapathy, FRC1114

This presentation focuses on three major areas, Strategic Design, Match Planning/Execution, and Scouting. Rather than spending time on equations and detailed calculations, the Strategic Design gives a more high-level overview of how to design an FRC robot. This portion of the presentation includes sections on such often-neglected strategic design areas such as Game Analysis, Chokehold Strategies, Cost-Benefit Analysis, Task Prioritization, and Tradeoffs using a case study from a past game. The Match Planning/Execution section of the presentation discusses effective habits and strategies that will help lead a team to victory. This is a must for those who enjoy the strategic aspects of *FIRST*. The Scouting section deals with effective techniques to collect information on your partners/opponents, and how to make the most of this data. The presentation is filled with entertaining and insightful historical *FIRST* anecdotes from the past 10 years. With the information in this presentation, you can turn your team from a mere competitor to a perennial powerhouse!

Electrical Design and Technique For Building A Competitive Robot

Alan Skierkiewicz, FRC111

Learn design techniques for maximizing the efficiency of your robot electrical system. The discussion will include topics on electrical system design, electrical component layout, wiring techniques and tooling, planning for replacement and a discussion of some of the common failure points in typical robot design.

Essentials of Effective Graphic Design

John Lucas Van Oort, FRC587, Riverside High School

Proper graphic and typographic design is an important part effectively marketing a team to the outside world. This presentation introduces some essentials of good design. The presentation focuses on basic concepts of typographic design (proximity, alignment, font selection, etc.) and graphic/multimedia design (raster and vector graphics, color matching, use of audio, etc.). If time permits, the presentation will conclude with practical examples such as designing a logo for an imaginary team, or creating a flyer for an event.

Establishing a Successful *FIRST* Rookie Team In A New District, Area, and/or Curriculum

Norman Morgan, FRC2468

Jane Young, FRC418

This presentation deals with learning about and obtaining the necessary resources to start curriculum-based robotics classes that compete in *FIRST*, as well as establishing Rookie teams in new areas and districts. Questions that will be addressed are: What are the do's and don'ts of a Rookie year? What are our top 10 resources and did we access them well and put them to our best use? What advice can we give to a new teacher or coach starting a Rookie program? How does today's technology impact the curriculum and the team? How does it help with communication and establishing a successful program? Mentors from FRC 418 and FRC 2158 will be joining me in sharing information, combining the experience and knowledge of a veteran team, a 2nd year team, and a rookie team that have worked to utilize our resources and strengthen our teams in curriculum-based environs and establishing new teams.

Excite, Inspire and Engage: Key Strategies for Regional Outreach Programs

Pamela Greyer, Chicago Public Schools/NASA AEL, FLL6406, 6597, 5759, 6293, 6795

Denise Spells, Chicago Public Schools/NASA AEL, FLL6406, 6597, 5759, 6293, 6795

Since 2003 Pamela Greyer, Director NASA AEL (Aeronautics Education Laboratory) Chicago has been involved in *FIRST* robotics programs. The NASA AEL Robotics Initiative created in 2007, assists and supports schools, districts and community organizations in forming *FIRST* robotics programs. This outreach initiative is unique in design and implementation as it covers a large geographic area and not only increases the formation of new teams but provides support, mentoring and a plan for sustainability and continuation of *FIRST* programs in Chicago's inner city communities and outlying counties. The NASA AEL Robotics Initiative focuses on *FIRST* core values while increasing STEM career awareness and skills in underrepresented and underserved youth through the following key outreach components: ROBO TURBO, a day of high energy Mindstorms robotics (500 participants) Chicago Public Schools High School Robotics Mentoring Program Distance Learning Robotics Workshops After-school robotics clubs Professional development (teachers and coaches technical and non-technical) Summer robotics camps for students Undergraduate/graduate engineering mentor/tutoring Involving parents through the NASA Family Café Strategies for sustainability and program continuation beyond year one Ms. Denise Spells, co-presenter and principal of a NASA AEL sponsored rookie team, will discuss commitment required from new teams, understanding the role of a mentor, and the importance of a continued presence from the outreach partner. Through this initiative, five new rookie FLL teams were formed this season with one advancing to the Illinois State Tournament. Fifteen new schools/community organizations are seeking support and help in forming teams for the 2008 season.

***FIRST* Scholarships: How Will Your Family Pay for College**

Murray Miller, College Planning Strategies

This workshop will assist the parents of college-bound students in understanding the ins and outs of financial aid and the college funding process. This workshop picks up where most high school financial aid workshops leave off, and educates families on how to reduce their college expenses. You will learn:

- *How you can tap into over \$9 Million Dollars in US FIRST scholarships!*
- *Critical mistakes most parents make when applying for college and how to avoid them.*
- *Things you should be doing right now if you are the parent of a high school student.*
- *How some parents send their student(s) to a private university for less than the cost of a state college.*
- *Little known techniques for maximizing the amount of financial aid you receive!*
- *Proven strategies to reduce out of pocket costs for families not eligible for financial aid!*

FIRST Technical Network: A Knowledge Base of Expert Resources

Mike DiBlasi, FRC190, Worcester Polytechnic Institute
John Morgan, FRC190, Worcester Polytechnic Institute
Evan Morrison, FRC190, Worcester Polytechnic Institute
Daniel Praetorius, FRC190, Worcester Polytechnic Institute

The *FIRST* Technical Network aims to provide a centralized source for all resources *FIRST* related. Users can submit and rate documents and articles, ranging from official game documents to technical and team management resources. Users also have the ability to pose questions to subject matter experts. In addition, the *FIRST* Technical Network aims to create a centralized team communications hub. This includes providing teams with tools to enhance collaboration, facilitating and simplifying communications between teams, and providing a portal to make sharing robot design files (i.e. code or models) much easier. Come and help shape the future of this exciting new network!

FLL Sensors - Building and Programming Tips and Tricks

Paul Tan, FLL543, St. Clement's School
Samantha Tan, FRC188, York Mills Collegiate Institute, Woburn Robotics

This session will cover the basics and various advanced tips on using NXT sensors. We will cover both the programming aspects and the building tips (i.e. why would you want to use two light sensors, and where would you put them). We will cover topics on how to teach these techniques to the kids – what works and what didn't in the past 7 years that I've been coaching. Our student mentor will also cover her experience with tips on how to explain things from kid to kid, as well as giving some insight on what interested her during her years as an FLL participant and mentor.

FRC Drive Train Design and Implementation

Madison Krass, FRC488
Fred Sayre, FRC488

This presentation addresses issues faced by *FIRST* teams in drive train design and implementation, providing a comparative examination of the components used as well as the benefits and pitfalls of most common designs. It provides consideration to the physical properties of drive train design that are of greatest interest to *FIRST* teams -- current draw, traction, maneuverability and speed -- though it is not an in depth tutorial of using mathematical simulation to determine drive train behavior. Finally, a series of tips and hints about good practices for design and maintenance offer advice about how to keep your robot in good condition for the entire season. Topics covered include failure points, component accessibility, getting the most from power transmission components and wisdom about the role a drive train should play in overall machine design.

How a FLL Team Influenced Thomas Jefferson High School for Science & Technology - Green School Design and Build

Rohan Deshmukh, FLL842, Rocky Run Middle School
Alex Chen, FLL842, Rocky Run Middle School

Thomas Jefferson High School for Science & Technology currently ranked as countries best High School in was built in 1965 and last renovated in 1987. Being a selective public school serving best minds have been waiting for renovation for several years due to design flaws, no sprinklers, leaking bathrooms, no wall insulation and poor lighting. Current energy usage is from nonrenewable energy resources. NXTRock Energizers, a second year FLL team (#842) audited TJHSST to influence County and School Design and Construction officials before the planned renovation in year 2009. During the research, we visited USPS's Renewable Energy Lab, volunteered at 2007 Solar Decathlon, experimented Solar panels, shared energy conservation ideas during the International Children's Festival, NASA Annual Space day, State Fair of Virginia and the team's forum board. In addition we did case study of recent LEED certified local High School. They toured and interviewed TC Williams,

HS, Alexandria, the Country's first Green School building 98% LEED certified. After state finals we presented our research to the teachers, architects, and Green building forum at TJHSST. Following are few recommendations - Replace the golf carts with solar/electric golf carts - Solar powered emergency lights, photovoltaic panels and evacuated tubes on the roofs to collect solar heat for hot water/heating and for solar chiller (lithium bromine) - Use efficient geothermal heat pumps - Skylights and light reflectors, sunrooms with double pane sliding windows with awnings to the buildings. - Implement strategy similar to the TC Williams High School for achieving Green Building.

How to Integrate All Three *FIRST* Platforms to Develop Students Who Can Apply for *FIRST* Scholarships

Nancy McIntyre, Senior Mentor, FRC1138, FTC83, 84, 85, FLL3905, 3906

Being able to incorporate all three *FIRST* platforms to develop students who are qualified and prepared to apply for the *FIRST* scholarships is an effort that I have been working toward for the last several years. It is also a great way to hook school administration and parents to help support the program. Having the three programs dovetail into each other and having the upper-class high school students working with the middle and elementary school students provides a rich environment for growth for everyone.

Improve Your FLL Robot Performance

KK Quah, FLL183

This presentation is for all FLL teams. Having been a coach now for 5 years and judging in some tournaments, some things keep getting repeated. In a recent tournament of 24 teams in Florida of which 17 were novice teams, none of the novice teams qualified for the State FLL. However, even in the veteran teams, as a table referee, many common mistakes surface. There will be specific examples of how a team can do better like using guides and reference points on the mission table to improve robot navigation and mission dependability. Use of jigs to help initial launch of a robot from base is also another way for teams to increase robustness of the mission but is neglected by many teams. Short videos of mission examples will be shown.

Integrating Design & Engineering Concepts to the Robot Development Process

Dr. Osato Osemwengie, FRC2387, Columbus Alternative High School, Battelle Memorial Institute
Mrs. Genevieve Robinson, FRC2387, Columbus Alternative High School, Battelle Memorial Institute
Mr. Christopher Brandon, FRC2387, Columbus Alternative High School, Battelle Memorial Institute
Mr. Steve Madland, FRC2387, Columbus Alternative High School, Battelle Memorial Institute

Battelle Memorial Institute in partnership with PTC and the Columbus Alternative High School (Team 2387) is excited to offer *FIRST* Robotics teams the opportunity to participate in the Battelle Engineering Experience/PTC Design and Technology in School Robotics Program. This program has been established to provide the necessary tools (Pro/ENGINEER and Windchill) for coaches and students to integrate design and engineering concepts and experiences into the robot development processes. Based on the precepts established by *FIRST* mission it is our hope by exposing today's students to design and engineering we will plant the seeds of innovation for tomorrow's scientists, engineers, inventors and designers. Pro/ENGINEER Wildfire is a powerful, parametric, feature-based, fully-associative, solid modeling system used to create models of parts and assemblies during the engineering process of product development. Once part and assembly models are created, several other Pro/ENGINEER Wildfire applications can be used to create a variety of deliverables, such as production drawings and photo-realistic rendered images. Pro/ENGINEER Wildfire can create a variety of model and geometry types, from block like models to very advanced surface models, and from single piece parts to complex assemblies with thousands of components. WINDCHILL, a content and process management software will enable members of *FIRST* Robotics teams via Web browser access, streamline, share robot development processes and deliver a superb robot.

Last as a State but *FIRST* in Robotics

Jeff Piontek, Hawaii Department of Education

We may have been last to be admitted as a state but we are first in the growth of robotics programs since 2005. The state had 8 FLL teams in 2005 and now has 80 teams where 63 of them competed in the Hawaii FLL tournament. In 2005 we had 7 teams that competed over the years with no more than 4 teams competing in any year, this year we have 26 teams competing and a regional *FIRST* tournament. The vex tournament was something new and we had 12 teams sign up for the inaugural program. This is amazing if you look at the fact that we only have 63 high schools statewide. The presentation will look at how these programs that align with our General Learner Outcomes (GLO's) for our students and the concept of gracious professionalism. The expectations of our students and their performance on standardized assessments in mathematics and science as compared to prior years. How do students that are in experiential learning programs compare on standardized assessments? The data will be aggregated and then analyzed to establish how these programs elicit enhanced student learning and in turn increased student performance. Additional questions to be considered: Can this increase in robotics programs be replicated? How do you fund it? Is it sustainable?

Leadership Basics

Kimberly O'Toole Eckhardt, FRC1511, Harris Corporation

Interested in becoming a leader? Want to be a stronger leader? Then this course is for you! A spin off from last year's seminar: Building Tomorrow's Leaders, How to Run an Effective Leadership Bootcamp, this year's course pulls out some of the bootcamp foundation concepts and teaches them to you in 45 minutes! Even the best leaders can use a refresher! Attendees will also be given information to obtain the resources needed to run a Leadership Bootcamp.

The Mighty 4-Bar

Paul Copioli, FRC217

Paul Copioli will explain the function and various forms of the "mighty 4-bar linkage," which is an efficient device that has served many *FIRST* teams well over the years. The motion of the linkage, design tips, and examples will be illustrated. This presentation will be of interest to students, teachers, or engineers interested in mechanical devices, linkages, and robot appendages.

Motivating Yourself and Your Team Members

Kimberly O'Toole Eckhardt, FRC1511, Harris Corporation

Wondering how to motivate your team members to take initiative, do awards, get tasks completed on time, show up on time, or kick off an event? Want to learn how to make the little extra moments of your time count, or how to be more productive? This presentation is geared towards students and adults who may need that extra boost or clues on how to motivate themselves and team members through effective methods.

Omnidirectional Drive Systems

Andy Baker, FRC45, AndyMark

No abstract provided.

Pneumatic Power Concepts

Raul Olivera, FRC111, Motorola

Most teams are familiar with how to work and optimize systems using electric motors; many even know how to work with their power curves. However, very few are familiar with how the forces,

energy levels and associated power concepts apply for pneumatic systems. This presentation will discuss comparisons between electric motor driven systems and pneumatic driven systems. Some teams also struggle with their pneumatic system running out of pressure in the middle of a match. This presentation will also discuss the concept of energy management in pneumatic systems and design considerations to optimize the system.

Preparing for your *FIRST* Job in Engineering

Ted Kuriata, BAE Systems engineer

Debbie Sallis, BAE Systems engineer

Are you thinking of a career in Engineering? If so, you will want to attend this workshop to hear directly from engineers and hiring professionals on how to navigate the "road to the workforce." BAE Systems engineers will provide you with an overview of the science and engineering work performed at the company, how they turn ideas into reality everyday, and ways to best prepare yourself for your *FIRST* job in engineering. They will share personal experiences and talk specifically on planning for a career in engineering and science, and what they wish they had done differently to prepare for the *FIRST* job. You will receive an in-depth look at what hiring professionals are looking for when recruiting engineers and talk specifically about workplace culture, expectations and accountability. Finally, you will see the impact of an engineer's work on a business and learn how BAE Systems products are introduced to men and women in today's Armed Forces. Bring your questions with you and be prepared for an interactive and dynamic session!

Prototyping Autonomous Operations of FRC Robots

Marc Center, FRC47

Because of common software (Easy-C Pro), similar microprocessor architecture between the VEX controller and *FIRST* controller (Microchip based), a regular robotics team can compete against more established robotics team by prototyping with a VEX robot the 15 second autonomous period. Presentation will focus on process used with this year's team to accomplish this goal. Smaller teams must normally wait on the team to build the full-sized robot before effective prototyping of autonomous period, but can use small VEX robot to begin development of autonomous period in parallel path during week one. Goal is to "raise the bar" on autonomous operation

Simulation: An Analysis Tool for Robotic Drive Systems

Ken Patton, FRC65, GM

Often, robotics teams are faced with questions about the performance of their drive systems. How well will our robot accelerate? How will it perform if we use additional motors? How much current will it draw? Questions like these can be answered using a tool called simulation. A simulation is a computer-based mathematical tool that solves for the motion of the robot given a set of inputs defining the motors and gearing of the robot. A tool such as this allows the user to investigate many possible drive configurations and performance scenarios. Simpler methods exist – but this method sometimes offers additional insight into the problems faced by robotics teams. This presentation will describe a spreadsheet-based simulation method, and illustrate some different ways to use it. The presentation is aimed at mentors, college students, and high school students who are interested in applying some math to their robot drive system.

Special Needs Children and *FIRST* Robotics Programs

Pamela Greyer, NASA AEL/Chicago Public Schools

The visual and hands-on nature of *FIRST* LEGO League robotics makes it a perfect fit for introducing special needs students to world of robotics. In traditional team settings, these students are usually excluded from participation based on behavioral issues or learning disabilities that could add an extra burden on coaches and volunteers during the season. During the 2007 competition season, several

special needs students approached coaches and asked how they could become involved in the team. These students were not considered for the team due to anger management issues, low grades, and other learning problems. Research has found however that hands-on activities that involve them in creative, explorative learning are more beneficial than traditional classroom learning strategies and can also assist students with behavioral issues as well as becoming a motivational tool in increasing skills in math and science. Another population, autistic children, can also benefit from building JFLL models and increase individual independence with the guidance and assistance of special needs teachers. How to build activities and a curriculum for special needs students around JFLL and FLL robotics will be the focus of this presentation. Various techniques that have been used by the workshop presenter in her work with special needs students in hands-on science programs will be presented as well as a new initiative in the Chicago Public School District to provide inclusion of special needs students in JFLL and FLL robotics in non-competitive as well as competitive environments.

Underwater *FIRST!* - What if your next project takes you to the edge of your comfort zone?

Fredi Lajvardi, FRC842, Arizona Promoters of Applied Science in Education
Norma Irigoyen, FRC842, Arizona Promoters of Applied Science in Education
Judith Beltran, FRC842, Arizona Promoters of Applied Science in Education

Come see how you can use VEX and FRC robot controllers to build a highly effective remotely operated vehicle, ROV, or underwater robot, to compete in the National Underwater Robotics Challenge in Chandler, Arizona. Learn the basics of ROV design and what you can do to water proof your electrical components. Watch the highlights from the 1st annual NURC competition won by the FRC team 1726, the NERDS. See what other components you need to be able to navigate underwater. Discover what the 2008 NURC mission is to see if your FRC team wants to dive in and take the challenge.

Using Collaboration Software to Jumpstart Your FRC Team

Graham Birch, PTC

As a mentor, have you ever wanted to get some quick information to a student, but you were still at work and couldn't get away? Have you found it difficult to share information among your team members? Are you a veteran team trying to mentor a rookie team, but aren't sure where to start? Would you like to manage the FRC build season like a real project? Online? With tasks and milestones? And keep track of them in real-time? Have you ever found yourself working with outdated information? Would you find it helpful to store all your CAD data in a single location? If you answered yes to these questions, check out this workshop where you will learn how to use PTC's Windchill to create an online collaboration workspace for your team, share information instantly regardless of your location, set up a project with milestones and deliverables, share and view CAD data, and hear about other teams who used Windchill successfully for the FRC 2008 season. Start planning for next season now!

Women in Engineering: Recruitment Challenges and Responses

Ally Whalen, FRC1311, Kell High School
Corynne Leduc, FRC1311, Kell High School
Erin Jones, FRC1311, Kell High School

"Why are academically prepared girls not considering or enrolling in engineering degree programs?" We know the issue is not one of ability or preparation. We know that girls are taking high school science and math courses at approximately the same rate as boys. The problem is one of perception. Girls and the people who influence them—teachers, school counselors, parents, peers, and the media—do not understand what a career in engineering looks like and therefore don't consider it as a career option. Professional interests for high school girls hinge upon relevance. Relevance

incorporates that a job is rewarding, and it suggests that the profession is for someone "like me." Girls want their job to be enjoyable, have a good working environment, make a difference, offer a good salary, and be flexible. This presentation addresses the challenges that exist in recruiting young women to careers in engineering, science, and technology. You will learn what the major obstacles are and techniques to overcome these challenges. This presentation also covers recruitment of young women into *FIRST* programs.

High Level Autonomous Programming

No abstract provided.

Technical Design

No abstract provided.