

# Georgia**FIRST**Robotics

## Georgia**FIRST** Robotics Symposium 2017 Session Topics

### **Engage, Excite, Experience: The Importance of Your Community**

Presenter: Isabel Evans

Description: Join FRC Team #2415 the WiredCats as we discuss how to engage our community in effective and meaningful ways. Come learn tactics for inciting a passion for STEM in many different communities, age groups, and audiences. We will not only explain methods in which teams can engage those around them, but we will also provide examples of community interaction and stress the importance of this practice. We aim to answer any and all pressing questions regarding community engagement and its role in FIRST robotics and STEM education.

### **A Case Study: How 4941 Won a State Championship**

Presenter: Sunny Gupta

Description: FRC 4941, Team RoboBibb won state championships in one of the most dominant ways possible, but how did they do that? How did they build a robot that was on the competitive edge for nearly the entire season? This presentation will explore what factors enabled FRC 4941 to pull a 180 and ultimately win a state championship.

### **The Student-Mentor Balance**

Presenter: Sunny Gupta

Description: Mentors are a large part of FIRST, but teams of all makes and sizes tend to struggle with their mentor-student balance. How much should a mentor help with the robot? How much students should be involved in the decision making? Should mentors be drive coaches? This presentation will tackle this complicated issue head-on and will help your team achieve a better student-mentor balance.

### **Time Management Through Agile Principles**

Presenter: Andrew Nichols

Description: FRC and FTC teams often struggle with managing their time. In this presentation we will discuss how Agile project management principles can be used to make small changes to your team's operations that have a big impact on your productivity and the quality of your final product.

### **Diversity FIRST—How to Encourage More to Participation**

Presenter: Jerrica Jones

Description: How to encourage more student participation, with an emphasis on creating more opportunities for girls and marginalized students. I will provide tips for recruiting female members, minority members, and at-risk students, as well as insight on how this could affect the team's learning environment.

### **Getting Started with FIRST Robotics (FRC) Programming**

Presenters: Gary Lewis and Allen Ayala

Description: This presentation is intended for mentors and team members who do not have experience with the specifics of programming for FRC robots. It is suitable for participants with, or without, other programming experience. It will review setup of computers and robot, networking, sensors and encoders, and control of motors and compressed air systems, along with a discussion of Iterative versus Command-Based programming base-types. This is not a basic programming course, but a "jumpstart" reference for that purpose will be provided and briefly discussed.

### **Advanced FIRST Robotics Controls (FRC) Programming**

Presenters: Gary Lewis and Allen Ayala

Description: A presentation of selected advanced programming topics, suitable for participants who have basic programming knowledge and who have successfully programmed an FRC robot. The FRC Command-Based programming base-type will be discussed in detail and used. A significant part of the presentation will involve the use of PID (Proportional, Integrative, Derivative) control systems, which are essential for smooth operation (or sometimes any operation) of systems using position or velocity sensing.

### **Vision Processing using Python and OpenCV**

Presenter: Andy Cash

Description: This presentation will cover use of the OpenCV package in Python to detect shapes on reflective tape and use that information for robot positioning. This session will cover how to set up the camera, run the algorithm on a co-processor (Raspberry Pi or nVidia Jetson), and transfer the features of the image back to the Rio via network tables.

### **DFM – Design for Manufacturability**

Presenters: Gwen Wrye, Carter Stokes and Ed Barker

Description: This presentation will cover design practices needed in order to use CNC manufacturing processes, primarily parts manufacturing using water jet technology, and downstream processes such as metal forming and bending. It is recommended that teams using water jet or other CNC processes send at least one representative, preferably with CAD experience. Participants are welcome to bring their computers with CAD software in order to review and practice the DFM process.

### **Advocacy – Supporting FIRST in Georgia**

Presenter: Danielle Newman

Description: This presentation will provide participants with information on how to perform effective advocacy. Practices learned here will help teams meet with political, educational, and business leaders to help gather support for teams and schools, which will help your team and FIRST grow and become more effective in our communities. Teams are highly encouraged to participate to learn how to help support efforts in the upcoming Georgia legislative session.

### **A Panel of Champions with 4188, 4941, and 1746**

Presenter: Sunny Gupta

Description: This panel will pick up just before state championships and ask the panelists about their experiences, feelings, etc. going through state championships, worlds, and for 4188, the Festival of Champions.

### **Engineering Design Process**

Presenter: Brent Hollars

The engineering design process is a critical component of engineering education and is a central figure in how engineers solve problems. This session will discuss

the engineering design process in its entirety, how it can be used in conjunction with an engineering notebook and how it can be implemented in the classroom and on the robotics team.

### **Use of Systems Engineering Methods in FRC**

Presenter: Columbus Space Program

Description: In 2017, CSP formalized, trained and used a formal systems engineering process during the six-weeks build period (and after) to build three robots and manage the process of completing all three robots by bag-and-tag including practice time. The key was our formal training certification program and dedication to use of systems engineering

### **Using 5S for FIRST Robotics**

Presenter: Columbus Space Program

Description: Skyla will present the 5S program and CSP's use of 5S for FIRST Robotics. We have been trained by Oneda and WestRock in the industry-standard safety/organization processes, and we will share our experience with the program and with use of the program in FIRST.

### **The Alumni Problem**

Presenter: Sunny Gupta

Description: Ever wonder why there aren't very many alumni programs around FIRST? From FIRST HQ to individual teams, it seems like no one really has a good idea about to engage and involve alumni. Join me as I look at this problem, try and understand its root causes, and use market segmentation to break the problem down into smaller, more manageable chunks.

### **Introduction to Networks and Robotics**

Presenter: Rick Kosbab

Description: As FRC Robots grow more advanced, it is important to understand the underlying framework of networking that makes them work. We start with a basic overview of how computers are networked together, then apply that to the FRC Robots, and ultimately the FMS at competitions. Learn tips on how to ensure better robot connectivity, including powering and position the radio and limiting data transmission.

### **Tips and Tricks from your Field Technical Advisors (FTA)**

Presenters: Rick Kosbab and Eric Niconovich

Description: Tips and tricks from common mistakes the FTAs see with a focus on robot design, preparing for events, event best practices, and what do to when things go wrong.

### **Developing a FIRST Quality Safety Program for FRC and FTC Teams**

Presenters: East Cobb Robotics

Description: EastCobb Robotics will host a class on how to establish and maintain a successful safety program for FRC and FTC teams. Our team's Safety Captain and Safety Co-Captain will conduct a comprehensive safety class for both rookie  
Using Drones as a Tool to Promote STEM

### **Developing a Drone Program for Outreach**

Presenter: Gardner Chambliss (G3 Robotics)

Description: The G3 Drone Program was conceived as a STEM supplement to FLL. The goal has been expanded to be an exciting way to promote STEM in underserved communities. The program is very successful starting with five teams the first year and targeting 70 in 2018.

### **Surviving Your Rookie FRC Year**

Presenters: Etowah Eagles

Description: What does starting an FRC team mean? This session will explore navigating your rookie year: fundraising, outreach, what to expect at events, kick-off, build season, post season, etc.

### **Dance Lessons for the Common Dance Songs of FIRST**

Presenters: Georgia Tech RoboJackets

Description: Learn the dance moves that will make you the star of the show!

### **Robotics At Georgia Tech**

Presenters: Georgia Tech RoboJackets

Description: Georgia FIRST is not the only place to find amazing robots! Learn what opportunities exist within Georgia Tech to continue your love of all things robots.

## **Approaches to Fundraising and Sponsor Acquisition**

Presenters: Georgia Tech RoboJackets

Description: Learn how to identify, approach and secure sponsors for meaningful fundraising for your team.