



2017 *FIRST*[®] Championship Conference
Presented by Southwest, ViaSat & Walt Disney Imagineering
Houston, TX April 19-21
Session and Workshop Descriptions

WEDNESDAY, APRIL 19

GEORGE R BROWN CONVENTION CENTER

4:00-5:00 pm	LabVIEW Programming for Beginners <i>Jon Rodriguez, Applications Engineer, National Instruments</i> If you are about to become the LabVIEW programmer for your team, or your team is thinking of using LabVIEW for <i>FIRST</i> Robotics Competition, come learn how to get started. Learn the advantages of graphical programming and graphical debugging. We will begin with some LabVIEW programming basics, followed by how to create and understand a simple robot program and how it interacts with the Dashboard.	370 A
4:00-5:00 pm	A Walk on the Field: Case Study of an <i>FIRST</i> Tech Challenge Walking Robot <i>Gaige Moore, Primary Designer, Programmer and Driver, FIRST Tech Challenge Team 247</i> <i>Evan Gagnon, Primary Builder, FIRST Tech Challenge Team 247</i> <i>J. Stephen Pendergrast, Teacher/Robotics Mentor, Pope John XXIII High School</i> Our <i>FIRST</i> Tech Challenge team was tired of building the same old square robot with wheels. We looked at the other team's strategies for this season's game and found that most of the robots, in New Jersey anyway, had essentially the same shooter and harvester mechanisms. We wanted to stand out from the pack, and make a walking robot! This robot has changed the game of <i>FIRST</i> for us. It inspires not only the other participants, but also the crowd. Every person who has seen the robot in action has come up to my team and asked numerous questions with awe on their faces. We believe this robot is the first ever walking robot in <i>FIRST</i> Tech Challenge competition history. Every structural part is designed and fabricated using CAD/CAM and CNC machines. Our presentation will describe in detail how we built and designed the robot, challenges we faced, and why we decided to implement such a crazy idea. We will also have some small 3D printed Bluetooth controlled hexapods with us and some lucky audience members will win them! Participants will learn to think outside the box robot, and will learn to open their minds to new engineering techniques while successfully solving game problems. Some engineering techniques include using CAD/CAM software to design novel structures that are actually used in the game instead of just for prototyping.	370 B/C



2017 *FIRST*[®] Championship Conference

Presented by Southwest, ViaSat & Walt Disney Imagineering
Houston, TX April 19-21

Session and Workshop Descriptions

4:00-5:00 pm	Social Media and Your Robotics Team <i>Jennifer Navarrete, Social Media, Communications and Outreach Team, FIRST in Texas</i>	370 D
	<p>From conception to competition, your robotics team has an exciting story to tell. It's a story people want to hear and participate in. But how do you break through all the noise in social media and make your story heard? Yes, there are hundreds of robotics teams all building and competing at the same time as you. But your team still has a voice and flavor of its own. I will show you how to pull back the curtain on your unique story in a way that will make others want to share it.</p>	
4:00-5:00 pm	Deep Neural Networks for Computer Vision: Do RIOs Dream of Electric Sheep? <i>Solomon Greenberg, Programming Lead, FIRST Robotics Competition Team 2898</i>	370 E/F
	<p>You might have heard of neural networks, or even seen what they can do. But how do they work? How can you make one? And most importantly, how do you use them to give your robot the upper hand in future <i>FIRST</i> challenges? Join Team 2898 in discussing the fundamental concepts of neural networks, and their applications inside <i>FIRST</i> Robotics Competition. Of course, we will go well beyond the Wikipedia basics; we will go over how teams can use deep neural networks to power and drive advanced autonomous behavior, similarities to existing classical computer vision algorithms, different network topologies, and common pitfalls when working with neural networks. You also learn how to implement them for yourself, accelerate them using NVIDIA's CUDA technology, and the best practices for collecting the all-important training dataset. Come if you're looking to get a head-start on the future of autonomous features in future <i>FIRST</i> Robotics Competition challenges, make your computer vision system more robust, or simply learn about this new and interesting technology.</p>	
5:30-6:30 pm	Advanced LabView Programming Techniques <i>Greg McKaskle, Chief Software Architect, National Instruments</i>	370 A
	<p>The LabVIEW Command and Control framework emphasizes software subsystems that more closely resemble how you think about your robot's capabilities. It is well suited to more complex robots and larger programming teams. Come learn about the details of the Command and Control framework and several other advanced techniques for better LabVIEW programming.</p>	



2017 *FIRST*[®] Championship Conference

Presented by Southwest, ViaSat & Walt Disney Imagineering
Houston, TX April 19-21

Session and Workshop Descriptions

5:30-6:30 pm	Change the Gender Equation: The SWENext Partnership with <i>FIRST</i> <i>Randy Freedman, Director of Student Programs, Society of Women Engineers</i>	370 B/C
	<p>Fewer women than men going into engineering – 19% of U.S. engineering students are women. (National Science Foundation Data Table 2-9: Undergraduate enrollment in engineering programs, 2013). Since 1950, the Society of Women Engineers (SWE) has been working to change this. Part of our modern strategy has been to partner with <i>FIRST</i>. For the past three years, SWE has supported 20 <i>FIRST</i> Teams who have made a commitment to gender equity on their team. Help SWE make an impact by learning the source of the inequity as well as research-based solutions.</p>	
5:30-6:30 pm	Calling all <i>FIRST</i> Volunteers! Tell us what you want! <i>Sonya Shaver, Volunteer Recognition Specialist, FIRST</i> <i>Leah Quimby, Volunteer Communication Specialist, FIRST</i>	370 D
	<p><i>FIRST</i> volunteers will have the opportunity to speak to <i>FIRST</i> Staff about the Volunteer experience and to help us improve the way we communicate with and recognize our awesome volunteers! Plus, take home some cool <i>FIRST</i> swag!</p>	
5:30-6:30 pm	Mysteries of the Solar System as Revealed by NASA Robots <i>Dr. Catherine Olkin, Deputy Project Scientist NASA's New Horizons Mission to Pluto and Deputy Principal Investigator of NASA's Lucy mission to Explore Trojans (FIRST Robotics Competition Team 1619, FIRST LEGO League Teams 24087, 24088, 24089)</i>	370 E/F
	<p>Humankind has launched robotic spacecraft and rovers to far-flung destinations of our solar system. Some of the wonders revealed by robots include jets of water erupting from the south pole of Enceladus (a moon of Saturn), the red pole on Charon (Pluto's largest moon) and a large heart-shaped glacier on Pluto. These scientific discoveries and others will be presented. Also, future NASA missions will be discussed including the newly selected missions to Trojan asteroids and a metallic world.</p>	
7:00-8:00 pm	Mentoring for Diversity and Inclusion in <i>FIRST</i> <i>Andy Baker, President, AndyMark</i> <i>Chris Fultz, Head of Program Management, Defense, Rolls-Royce</i>	370 A
	<p>Yes, this is two white guys presenting about diversity. We're both <i>FIRST</i> mentors, fathers, and husbands, empathetic for the lack of diversity within <i>FIRST</i> teams, but hopeful about the improvements the <i>FIRST</i> community is experiencing in this area.</p>	



2017 *FIRST*[®] Championship Conference

Presented by Southwest, ViaSat & Walt Disney Imagineering
Houston, TX April 19-21

Session and Workshop Descriptions

7:00-8:00 pm

Business Plans Made Easy as π & Why You Should Do Them

370
B/C

FIRST Robotics Competition Team 2655

Mike Wenig, 8-year Award Mentor, corporate and lawyer and CPA, Tuggle Duggins, PA

Susan Miller, Team Awards Lead (Outreach, Chairman's and Business Plan

Persia Ghotbi-Taheri, Chairman's and Business plan team

Lauren Starkey, Chairman's and Business plan team

FIRST Robotics Competition Team 2655 will discuss the essential elements needed to establish a good business plan for your team. Through a step by step discussion, we will guide you through the process of building a business plan by applying real-world plan components to the *FIRST* program. Our goal is to share the tools we use to help you establish an effective business plan for your team along with how to use key elements of the plan to aid with fundraising and community outreach.

7:00-8:30 pm

Looking for Solutions to Help You and Your Students Better Manage the Competitive Process?

370 D

Chonnie Blair, Programs Supervisor, PMI Educational Foundation

The solution is here: project management skills and tools.

Student competitions can be a powerful learning method. They are a wonderful way to teach students how to collaborate, be creative and develop great presentation skills, but every competition contains many moving parts. When students plan, and organize their competitive projects and they define deadlines, responsibilities and outcomes – all these moving parts come together in the form of a wonderful project--probably a spectacular robot!

This hands-on project management workshop will:

- Provide a basic introduction to project management
- Show the connections between project management, STEM and competitions to build career and college ready students
- Demonstrate the value that project management adds to STEM competitions
- Show you where to find high value, no or low cost resources and training in managing learning projects
- Provide examples of other competitions that have integrated project management



2017 *FIRST*[®] Championship Conference

Presented by Southwest, ViaSat & Walt Disney Imagineering
Houston, TX April 19-21

Session and Workshop Descriptions

7:00-8:00 pm

Building and contributing to WPILib Suite

370 E/F

Brad Miller, Director *FIRST*/WPI Research Group, Worcester Polytechnic Institute
Peter Johnson, Member, *FIRST* Robotics Competition Control System Team, Deputy Program Manager, Northrop Grumman, Mentor *FIRST* Robotics Competition Team 294, and Author, 2017 C++/Java CameraServer.
Thad House, *FIRST* Alumni/Mentor. WPILib Suite Contributor, Instructor, Great Minds Robotics and Developer of C# WPILib port
Kevin O'Connor, *FIRST* Robotics Competition Engineer, *FIRST*, Alumni *FIRST* Robotics Competition Team 2175, Former mentor, *FIRST* Robotics Competition Teams 2175 & 3753, Mentor *FIRST* Robotics Competition Team 238
Austin Shalit, *FIRST* Alumni, Contributor, WPI Class of 2020
Fred Silberberg, WPILib Suite contributor/build master, *FIRST* Tech Advisor, Alumni of *FIRST* Robotics Competition Teams 61 & 190, Software Developer at Microsoft currently working on Compilers

WPILib C++ and Java, is the software library and tools used by most *FIRST* Robotics Competition teams. We will talk about how to build WPILib to extend it for your own use and how you can help all *FIRST* Robotics Competition teams by contributing to the software suite as it transitions to a more open source project model. WPILib Suite architecture and how to build and contribute to WPILib. We will discuss how WPILib and the related tools are organized and how to build the tool suite. In addition, we will talk about opportunities for contributing to the WPILib suite and how to make submissions. We'll also talk about the new Vendor Libraries and how one can make their own custom plugins for WPILib that can be distributed to their team and others.



2017 *FIRST*[®] Championship Conference

Presented by Southwest, ViaSat & Walt Disney Imagineering
Houston, TX April 19-21
Session and Workshop Descriptions

THURSDAY, APRIL 20

GEORGE R BROWN CONVENTION CENTER

8:30-10:30 am	Big Bacon Theory of Image and Marketing, Branding and Marketing your Team <i>FIRST</i> Robotics Competition Team 1902, Exploding Bacon (Elise Cronin-Hurley, Team Lead, Marketing & Image Mentor, Sarah Holman, Ruhi Lankalapalli, RJ Woods, and Sean Cannon) Whether you are a veteran team looking to rebrand or a rookie team finding your niche, a marketing strategy provides greater sustainability of <i>FIRST</i> teams through improved recruitment and retention of students, mentors and sponsors. We will give you the tools to evaluate where you are and how to develop a strong foundation to reach your target audiences inside and outside of <i>FIRST</i> . Join us for tips on how to develop a more memorable brand.	370 B/C
9:00-10:00 am	The Top 20 Robots in <i>FIRST</i> Robotics Competition History Andy Baker, President, AndyMark This presentation highlights 20 of the best robots in the history of the <i>FIRST</i> Robotics Competition. Stories and videos will describe why these trend-setting, inspiring robots impacted the direction of <i>FIRST</i> Robotics Competition robot design and performance. Students and mentors who are into <i>FIRST</i> history will be interested in this presentation by long-time <i>FIRST</i> mentor Andy Baker.	370 A
9:00-10:00 am	Understanding Female Involvement in <i>FIRST</i> Robotics Competition: Stats, Strategies, and Stories Addie Bjornson, Assistant General Manager, <i>FIRST</i> Robotics Competition Team 2557, the SOTAbots In Washington, Oregon, and Alaska, girls make up around 30% of <i>FIRST</i> Robotics Competition teams. The SOTAbots, <i>FIRST</i> Robotics Competition Team 2557, is doing new research to investigate this number further by surveying FRC teams in the Pacific Northwest District on the gender demographics of their teams. We have collected data on female member and mentor involvement, and have examined strategies that teams use to recruit girls and the effectiveness of those strategies. Join us to understand the gender demographics in this district, and learn how to recruit and sustain more girls on your team!	370 D



2017 *FIRST*[®] Championship Conference

Presented by Southwest, ViaSat & Walt Disney Imagineering
Houston, TX April 19-21

Session and Workshop Descriptions

9:00-10:00 am	Revolutionizing the Face of Technology: The National Center for Women and Information Technology's (NCWIT) Best Resources and Promising Practices to Increase Girls' and Other Underrepresented Minority Participation <i>Ammi Ludwick, Program Director, Aspirations in Computing Recognitions</i> <i>Terina-Jasmine Alladin, Regional Affiliate Manager, Aspirations in Computing and AiC Community Manager</i> NCWIT will offer researched based resources on unconscious bias, male advocacy, girls and other underrepresented minority participation in today's tech arena and discuss positive ways to include all members of your <i>FIRST</i> community as change agents.	370 E/F
10:30-11:30 pm	A New Approach to Middle School STEM Using Drones <i>Gardner Chambliss, Engineer, Atkins Global, and Mentor, G3 Robotics and Drone Team</i> This nation needs our students to be the new innovators in the STEM related fields. We have seen that the best time to interest student in STEM in middle school. G3 Drones for Good is an exciting STEM program for the <i>FIRST</i> LEGO League off season. It takes the problem solving, research and team building skills learned in <i>FIRST</i> LEGO League and take them to the next level. Students learn the physics and engineering of a drone. They then design and build their own drone, learn how to fly and compete in a fun-filled flying competition.	370 A
10:30-11:30 am	DIY Intelligence <i>Murali Gopalakrishna, Head of Product Management for Intelligent Machines, NVIDIA</i> <i>Jesse Clayton, Senior Manager for Product Management for Intelligent Machines, NVIDIA</i> Autonomous machines and AI are changing our world. High schoolers can create high performance intelligent devices using NVIDIA's Jetson embedded supercomputer. Develop powerful applications today with advanced AI and computer vision using NVIDIA's deep learning tools and JetPack software.	370 D
10:30-11:30 am	How to Create a Sustainable, Long-Term Robotics Program Anywhere in the World <i>Dr. Rachel Knoll, Manager, Yeruham Robotics</i> <i>Liron Gurvitz, Lead Mentor, Yeruham FIRST Robotics Competition Team 3211</i> <i>Rotem Stahl, FIRST Alumni, Yeruham FIRST LEGO League and FIRST Robotics Competition</i> In 2009, Yeruham started its first <i>FIRST</i> LEGO League team. Now, it has over 70 teams with 42% of kids doing robotics. That model is starting to get adopted in various municipalities in Israel as well, and now, even in other continents. What started as a team in the middle of the desert, is now growing and overcoming boundaries of religion, culture and distance. Come and see what are the visions of the founders and leaders of the successful program.	370 E/F



2017 *FIRST*[®] Championship Conference

Presented by Southwest, ViaSat & Walt Disney Imagineering
Houston, TX April 19-21

Session and Workshop Descriptions

11:00-1:00 pm	LEGO[®] Education WeDo 2.0 Workshop <i>Pedro Alejandro Yang, International Competitions Manger, LEGO[®] Education (name TBD) LEAP Teacher</i>	370 B/C
12:00-1:00 pm	Remote Mentoring and Independent Development <i>FIRST Tech Challenge Team 8569, RoboKnights</i> <i>Rosalind Radcliffe, Mentor, FIRST Tech Challenge Team 8569, RoboKnights</i>	370 A
12:00-1:00 pm	Robots Around the World: Bringing <i>FIRST</i> Robotics Competition and the <i>FIRST</i> Progression of Programs Everywhere <i>FIRST Robotics Competition Team 3132</i>	370 D

In this session, we will explain how we experimented with and developed a system that allows us to have our team working even while separated, and allowed our mentor who travels internationally to continue to support us from anywhere. This could even be used for mentors who are never at the same location. Coordinating code and tasks across multiple programmers and team members requires extra work; having programmers work at home without access to the robot requires extra information. By using an online collaboration capability along with a GitHub instance allows team members to work efficiently, identify their assignment, tag the work they are doing and check it in associated with work item associated with it. We started with our programming group, but it could be used for the entire team at any level of *FIRST*. This helps teach 21st century skills. We will discuss what we learned, what worked and what did not. Using tooling we have our own electronic Agile board. Key capabilities discussed will include working with GitHub and using track and plan to manage work.

In the world of STEM, it is crucial that everyone, everywhere has access to the technology of the future. However, it is often those who need these resources the most that go without. 'Robots Around the World' (RAW) is an exciting program that has managed to break down the boundaries of race and social class to connect student around the world. We show that not only can you build a *FIRST* Robotics Competition robot in 2 days, you can build a future. Come see why bringing together minds from around the world can benefit not only these student, but yourself as well. Hear the stories of those who have travelled with the program to the Australian outback, Navajo Reservation, and inner-city Sydney and see for yourself just how you can impact everyone, everywhere.



2017 *FIRST*[®] Championship Conference

Presented by Southwest, ViaSat & Walt Disney Imagineering
Houston, TX April 19-21

Session and Workshop Descriptions

12:00-1:00 pm	The Secret to a Better Robot: Teambuilding in <i>FIRST</i> Robotics Liam Fay, <i>FIRST</i> Robotics Competition Team 2485 Kira Hirsch, <i>FIRST</i> Robotics Competition Team 2485 <p>Discover the secret of team work and Coopertition through this proven, exciting and impactful improv-based team-building workshop. Attendees will laugh while learning valuable collaboration skills to share with their teams. Led by experienced <i>FIRST</i>ers with a background in improvisational comedy and successfully presented to teams throughout Southern California, The Secret to a Better Robot: Team Building in <i>FIRST</i> Robotics will bring laughter, wisdom and take-home methods for becoming a more cohesive, successful <i>FIRST</i> Robotics Competition team. The first of its kind and based on the teachings of Stanford Professor Dan M. Klein and short-form improv, The Secret to a Better Robot: Team Building in <i>FIRST</i> Robotics is especially designed for <i>FIRST</i> Robotics Competition and <i>FIRST</i> Tech Challenge teams and will change the way your team works together for the better! You'll be glad you came.</p>	370 E/F
1:30-2:30 pm	Robotics for Development: How Increasing Teams' Global Impact Positively Affects Students Achievements Dr. Yao Zhang, CEO, RoboTerra Inc. <p>RoboTerra has been providing more than \$50,000 grants and thousands of volunteering hours to <i>FIRST</i> Robotics Competition and <i>FIRST</i> Tech Challenge teams globally via the RoboTerra Global Impact Grant program. With impressively noticeable success stories of the students and schools through the grant program, our researchers carried out a small scale longitudinal study to learn what are the key factors leading students' success via robotics education. In this session, we will share some key findings from our study: the importance of developing students' Inter-Cultural Competency (ICC) in team-based learning and how Robotics is an ideal learning vehicle for achieving this. We will share success stories of <i>FIRST</i> Tech Challenge and <i>FIRST</i> Robotics Competition teams who mentored international rookie teams and how the experiences greatly increase learning results and ICC for students on both side. Case studies on successful teams and students will also be shared, from which audience can learn not only experiences and techniques in developing teams' ICC, but also learn about available funding opportunities for developing a robotics team's global impact in the training season to the competition season and beyond.</p>	370 A



2017 *FIRST*[®] Championship Conference

Presented by Southwest, ViaSat & Walt Disney Imagineering
Houston, TX April 19-21

Session and Workshop Descriptions

1:30-2:30 pm	Libraries, Makerspaces and Robots! Stem Programs in Library 2.0 Chuck Stephens, STEM Coordinator, Pasco County Libraries, Pasco County, Florida, Coach <i>FIRST</i> Robotics Competition Team 5276 Edgar Allan Ohms & <i>FIRST</i> Tech Challenge Team 2845 Team Duct Tape Terri Willingham, Author, <i>Makerspaces in Libraries</i> (Rowman & Littlefield, 2014) , Regional Director, <i>FIRST</i> in Central Florida	370 B/C
1:30-2:30 pm	Analysis and Engineering in the Age of the International Space Station Matthew Horstman, Lead Engineer, Booz Allen Hamilton	370 D
1:30-3:30 pm	Chairman's Chat John Larock, Coordinator, <i>FIRST</i> Robotics Competition Team 365, The Miracle Workerz <i>FIRST</i> Hall of Fame Teams Championship Chairman's Award Judges	370 E/F

Libraries are changing. Circulation is down and demand for programs is growing. Come see how *FIRST* is a good fit for the modern library, providing educational, organizational and leadership opportunities to young. Libraries are also good for *FIRST*, providing a stable base of operation outside the traditional school system and a more flexible environment for young minds to explore. This workshop is hosted by modern library professionals eager to share the library of the future.

The presentation will cover everything from the inception of ISS to present-day operations and utilization. Participants will be given a guided tour of the assembly of ISS modules, external robotic activities, scientific research, and a picture of day-to-day life in space. They will be introduced to the structure of station, along with how station operates externally and internally. Finally, participants will be given an overview of the scope of work needed on the ground, and a picture of working for the space station program. Relevant examples of engineering analyses on the ground, along with the CAD models which these analyses rely upon, will be demonstrated.

The Chairman's Chat is a long-standing *FIRST* Championship tradition. Representatives from Hall of Fame teams (*FIRST* Robotics Competition teams who have won the Championship Chairman's Award) and actual Championship Chairman's Award judges will serve on a panel to share their experiences competing for and judging the top award in *FIRST* Robotics Competition - The Chairman's Award. The session will have a panel format and will consist mostly of an interactive Q&A session between the audience and panelists. Please bring as many team members and Chairman's Award questions as you would like!



2017 *FIRST*[®] Championship Conference

Presented by Southwest, ViaSat & Walt Disney Imagineering
Houston, TX April 19-21

Session and Workshop Descriptions

3:00-4:00 pm	Put <i>FIRST</i> to Work for You: Leveraging Your <i>FIRST</i> Experience for Professional Success Courtney Lach, Campus Team, Qualcomm Incorporated Jay Flores, STEM Ambassador, Rockwell Automation Sandra Gonzalez, Human Resources, Space Exploration, The Boeing Company Len Kluff, Vice President, Human Resources, NRG Christine Rath, Lead Associate and Recruiting Manager, Booz Allen Hamilton Fortune 500 companies want and need <i>FIRST</i> talent! Join us for a special panel discussion made up of <i>FIRST</i> Strategic Partners including Boeing, Booz Allen Hamilton, NRG, Qualcomm and Rockwell Automation. Whether you're in school or have years of work experience under your belt, you'll get information about the recruiting priorities at these top companies as well as tips that will help guide you to career paths that leverage your <i>FIRST</i> skills. Participants will walk away with helpful tips and advice on how to build your professional networks, strengthen your resume, and advance your career by leveraging your <i>FIRST</i> experience as a student, mentor, or volunteer.	370 A
3:00-4:00 pm	IQ & EQ - How to become a Polymath and Empath Allen Saakyan, Founder, Producer, Host, Eureka! Science Comedy What's the importance of STEAM, EQ, and Business skills in today's world? If I learn more about Cosmology, how could that better help me understand Neuroscience, Biotech, Energy, Robotics, and AI? What are key strategies for becoming more emotionally intelligent? Join us for an interactive, relatable, educational, and entertaining conversation with science communicator and motivational speaker Allen Saakyan as we dive deep into IQ & EQ - How to become a Polymath and Empath.	370 B/C
3:00-4:00 pm	Calling all <i>FIRST</i> Volunteers! Tell us what you want! Sonya Shaver, Volunteer Recognition Specialist, <i>FIRST</i> Leah Quimby, Volunteer Communication Specialist, <i>FIRST</i> <i>FIRST</i> volunteers will have the opportunity to speak to <i>FIRST</i> Staff about the Volunteer experience and to help us improve the way we communicate with and recognize our awesome volunteers! Plus, take home some cool <i>FIRST</i> swag!	370 D



2017 *FIRST*[®] Championship Conference
Presented by Southwest, ViaSat & Walt Disney Imagineering
Houston, TX April 19-21
Session and Workshop Descriptions

FRIDAY, APRIL 21

GEORGE R BROWN CONVENTION CENTER

8:30-2:30 am

VIP Educator Summit

Vinnie Rodino, Director of School Engagement, *FIRST*

Jamie Sachs, Director of Education, *FIRST*

Heidi Sipe, Superintendent, Umatilla School District, Oregon 2016 Superintendent of the Year

Dr. Art Cavazos, Superintendent, Harlingen Consolidated Independent School District

LEGO Education

The *FIRST* 2017 Championship Educators Summit will provide educators whom may not be familiar with *FIRST* a comprehensive overview. Superintendent key note speakers will share the impact of *FIRST* on their students and community. Presenters from *FIRST* will share information regarding educator resources, available *FIRST* curriculum, how to start *FIRST* teams, a hands-on activity with LEGO Education, student led ambassador tours of the pits and competitive areas with a Q&A panel session with current coaches/mentors and student participants.

370
B/C

9:00-10:00 am

Arms and Manipulators

Mark Taylor, Kettering University Program Director for the *FIRST* Robotic Community Center

In this session, we will review a variety of manipulators and arms that have been used in past *FIRST* Robotics Competition games. Pros and cons will be discussed for each type of motors, gear ratio, torque which move the arms and manipulators.

370 A



2017 *FIRST*[®] Championship Conference

Presented by Southwest, ViaSat & Walt Disney Imagineering
Houston, TX April 19-21

Session and Workshop Descriptions

9:00-10:00 am	Girls Will Be Girls: Tips for Overcoming Unconscious Bias in Female STEM Engagement <i>Dr. Mary Isaac, Consultant/FIRST Volunteer</i>	370 D
	<p>Have you ever wondered why so many girls love science and math when they are 8 or 9, yet few end up as doctors, or scientists, or especially, engineers and technologists? Have you ever noticed that many female <i>FIRST</i> Robotics Competition team members gravitate towards roles that demand "softer" skills, such as managing the business aspect of the team, or marketing? There's a reason for both and they are connected. In fact, there are several reasons why female participation in the engineering workforce is still less than 15%, but the reasons aren't as important as how you can help fix it. As coaches and mentors, you have a significant influence on what the girls on your teams do with the rest of their lives, and what you learn in this session can help you pave the way for more girls to gainful careers in engineering and technology.</p>	
9:00-10:00 am	Your <i>FIRST</i> Narrative: Presentation Literacy Skills with TED-Ed <i>Ashley Kolaya, Program Manager, TED-Ed</i>	370 E/F
	<p><i>FIRST</i> participants have incredible stories to tell. As any innovator will tell you, learning how to create a gripping narrative is critical. In this age of fast-paced micro chats, what really gets us to click, reflect, and pass it on...is a great story. Come get a jump-start on your story utilizing the most popular narrative framing tool of our generation—the TED talk. Begin mastering the concept of having a story arc and how to frame your unique narrative. Did you know: Through a new partnership with TED-Ed, all <i>FIRST</i> students now have access to presentation literacy curriculum from these masters of the art! <i>FIRST</i> students will also have the opportunity to upload their TED talks to the TED-Ed platform (and yes, maybe even get an invite to give a talk from the famous red-dotted stage at a future TED-Ed weekend).</p>	
10:30-11:30 am	Doing <i>FIRST</i> Overseas: Opportunities and Challenges from China <i>Andrew Bannish, Program Manager, China FIRST</i>	370 A
	<p><i>FIRST</i> in China has been growing steadily since its arrival there over 15 years ago. We wish to give an overview of how the <i>FIRST</i> program grows in an entirely different country and culture along with what lessons can be drawn for anyone involved in the program. We also invite any teams, universities, regional partners and anyone else to learn about TV shows, university engagement, and opportunities to travel to China as well as how you can get involved!</p>	



2017 *FIRST*[®] Championship Conference

Presented by Southwest, ViaSat & Walt Disney Imagineering
Houston, TX April 19-21

Session and Workshop Descriptions

10:30-11:30 am	<p>Who Wants to Build a Scouting App that can Talk Tableau?</p> <p><i>FIRST Robotics Competition Team 2102 - Team Paradox (Will Ferrari - Co-Engineering President, Wayde Gilliam IV - Co-Engineering President, Connor Still - Scouting Lead, Spencer Klawans - Developer, Wayde Gilliam III - Mentor)</i></p> <p>Want to build a mobile-optimized, web-based scouting application with both in-app analytics and Tableau integration? Want to learn how to do so on the cheap as in for like zero dollars? Then this session is for you! We will begin with a discussion on how we used technologies like Jekyll, jQuery, and Firebase to build our team's scouting application that we then host for FREE on GitHub. From there, we'll walk through the application; how it works and how we let the data drive our winning alliance selection for the second year in a row. We'll describe how we built a custom Tableau Web Data Connector that allows us to pull data directly from our Firebase database into Tableau for analytics, and demonstrate some of the visualizations we've developed for this year's competition. The session will conclude with plans to incorporate machine learning, as well as, provide you with several resources to help get your team up and running on our application framework today. Code presented in this session will be available for download and the session will be DEMO heavy. Our goal is to enable every team willing to put in the work, to be able to have their very own scouting application ready to go for 2018!</p>	370 D
11:00-1:00 pm	<p>“WOMEN IN STEM.... Things We Want You to Know!” An Interactive Discussion with Women Leaders in Technology</p> <p><i>Carla Proulx, Alliances Manager, FIRST</i> <i>Professional Women from American Airlines, Astoundz, BKD CPAs & Advisors, Disney, FEDEX, NRG, Qualcomm, Rolls Royce USA, Society of Women Engineers (SWE), UL, University of Kansas, ViaSat Inc.</i></p> <p>Prominent career women working in technology fields and <i>FIRST</i> Alum pursuing STEM related degrees will candidly share their experiences, challenges and earned wisdom with girls considering industry careers. They will cover subjects like changing careers; how men and women think differently; the importance of confidence; ways for women to be recognized as key contributors in the male dominated STEM arena and will answer questions about everything and anything YOU want to know.</p>	370 E/F



2017 *FIRST*[®] Championship Conference

Presented by Southwest, ViaSat & Walt Disney Imagineering
Houston, TX April 19-21

Session and Workshop Descriptions

12:00-12:40 pm	Live Coaching Your <i>FIRST</i> story with TED-Ed <i>Ashley Kolaya, Program Manager, TED-Ed</i>	340 A/B
	<p>Have you always felt like shouting your <i>FIRST</i> story from the rooftops but never known where to start? A few lucky student audience members will get a chance to live workshop their story. We know <i>FIRST</i> students have problem-solving savvy so deeply imbued within them, they're poised and ready to become the next generation of future innovators. With the onset of any innovation comes the need to communicate it with the most powerful, concise narrative. Savviness with presentative literacy and narrative building will be a critical skill you need for your future. We know <i>FIRST</i> students have incredible stories to tell. Get a jump start now on how to create a narrative using the most popular genre around, the TED talk. You'll leave with a true understanding that the art of framing your most powerful narrative begins with your own authentic experience.</p> <p>If you want to volunteer to be one of the students to get live coaching from Ashley, please come prepared with an idea for your TED-talk narrative.</p>	
12:00-1:00 pm	Open-Source Robot Sensor Fusion: IMU, Quadrature Encoders, Vision Processing and LIDAR <i>Scott Libert, Founder, Kauai Labs; Software/Control System Mentor, Team 2465 (KauaiBots); Control System Adviser</i> <i>Tim Easterling, LabVIEW Developer, Kauai Labs; Programming/Electrical Mentor, Team 6043 (Allegan Tigers)</i>	370 A
	<p>Via the SF2 Sensor Fusion Framework Initiative, Kauai Labs goal is helping <i>FIRST</i> Robotics Competition teams take their robots to the next level by providing a framework and associated algorithms enabling more sophisticated autonomous and driver-assisted navigation features. As robotics technologies advance within industry, educational and military settings, Kauai Labs is committed to bringing these capabilities to <i>FIRST</i> Robotics Competition teams in open-source, easy-to-use packages including training materials and examples, helping <i>FIRST</i> Robotics Competition Teams Build Better Robots.</p> <p>Join us to discuss SF2 and its relationship to navX-MXP/navX-Micro and technologies including ROS and Cloud Computing.</p>	



2017 *FIRST*[®] Championship Conference

Presented by Southwest, ViaSat & Walt Disney Imagineering
Houston, TX April 19-21

Session and Workshop Descriptions

12:00-1:00 pm	Bringing <i>FIRST</i> Robotics to the Boys & Girls Clubs of America <i>Robert Steele, Coach/Mentor, FIRST Robotics Competition Team 1983</i> <i>Steve Burke, Coach/Mentor, FIRST Robotics Competition Team 1983</i> <i>Kaeden Wile, Erin Demaree & Kenny Pham, Student Leads, FIRST Robotics Competition Team 1983</i>	370 D
1:30-2:30 pm	Robots are a Girl's Best Friend <i>Mari Bray, Captain of FIRST Robotics Competition Team 1280</i>	370 A
1:30-2:30 pm	The Power of Math and Science Can Make You a Superhero! <i>Jay Flores, STEM Ambassador, Rockwell Automation</i>	370 D

The Boys & Girls Clubs of America have partnered with *FIRST* Robotics for several years but it has been difficult to engage them and the number of *FIRST* teams in Boys & Girls has fallen short of the potential. This session will show you how to hold a Robotics School for club staff, create an introductory Lego game, hold a kickoff and a competition while promoting future engagement in *FIRST*.

This workshop will cover the differences between working on an all-girls team versus a co-ed team and how to make your team environment more welcoming and inclusive for all your students. Mari will draw from her experiences on multiple teams to harness the benefits of inclusion and diversity in *FIRST* Robotics Competition. There will be question and answer time for the audience.

Get excited about the power of STEM with entertaining educational examples of how superheroes, cartoons, and video games leverage the power of math and science. Then learn to look around and see the real-life applications of STEM in your daily lives, and take personal action to become engaged with them. Your team's outreach programs are going to get an exciting makeover that is still very educational and even more effective in reaching youth on their terms!



2017 *FIRST*[®] Championship Conference

Presented by Southwest, ViaSat & Walt Disney Imagineering
Houston, TX April 19-21

Session and Workshop Descriptions

1:30-3:30 am **Strategies for using computer vision in *FIRST* Robotics Competition** 370 E/F

Brad Miller, Director *FIRST*/WPI Research Group, Worcester Polytechnic Institute
Peter Johnson, Member, *FIRST* Robotics Competition Control System Team, Deputy Program Manager, Northrop Grumman, Mentor *FIRST* Robotics Competition Team 294, and Author, 2017 C++/Java CameraServer.
Thad House, *FIRST* Alumni/Mentor. WPILib Suite Contributor, Instructor, Great Minds Robotics and Developer of C# WPILib port.
Austin Shalit, *FIRST* Alumni, Contributor, WPI Class of 2020

Computer vision is a hard problem, but there are many ways to increase your chances of success. The presenters will demonstrate several hardware and software tools and techniques to help your team find the best way to accomplish its vision goals. We will discuss doing the vision processing on the roboRIO, on a coprocessor, and on the Driver Station laptop. Also, the networking implications of all the solutions. In addition, we will talk about using GRIP for developing robot vision algorithms.

3:00-4:00 pm **Solder and Sonder: Stories of Identity in STEM** 370 A

Jaeyun Stella Seo, Director of Operations, STREAM Education Foundation

Sonder: John Koenig's term combining the German and French meanings, "special" and "to probe" respectively. It is the awe—inspiring realization that others lead their own lives—they have their own thoughts, sorrows, hobbies, and the like. Other people exist on parallel timelines to yours.

In this conference session, we'll discuss intersectional identity within the STEM community and why it matters. Our society tends to speak about identity in STEM in broad, general, sweeping strokes. In this talk, we'll take a closer look at a collection of stories of individuals who have dealt with intersecting identities across gender, race, sexuality, mental health, interests, and the like. We'll explore how these different identities have shaped paths and lives. This talk is meant to encourage and inspire students who feel "other"-ed in communities (especially in STEM), and to remind coaches and mentors that there is no all-purpose solution or approach to teaching students.



2017 **FIRST**[®] Championship Conference
Presented by Southwest, ViaSat & Walt Disney Imagineering
Houston, TX April 19-21
Session and Workshop Descriptions

3:00-4:00 pm	Special Olympics Unified Robotics: Empowering Students with Special Needs Through Robotics	370 B/C
	<i>FIRST Robotics Competition Team 4911, CyberKnights</i> <i>Jane Yi, Public Relations and Outreach Lead</i> <i>Joanne Yi, Chairman's Presenter,</i> <i>Laurie Machida, Public Relations Member</i> <i>Eneya Kwelese, Public Relations Member</i> <i>Madeleine Schwitters, Founder, Kids and Tech</i> <i>Eva Lu, Scouting Lead</i> <i>Noelle Foster, Mentor</i> <i>Mikel Thompson, Coach</i>	
	<p>This session is about Special Olympics Unified Robotics, a robotics program for students with and without special needs. Featuring a panel of individuals (students, mentors, and parents) impacted by Unified Robotics. Join us to empower students of all abilities and learn how to change lives within your own schools and communities.</p>	
3:00-4:00 pm	The Journey of MitraClip: A Story of Innovation	370 D
	<i>Santosh Prabhu, Director of Research and Development, Abbott Structural Heart</i>	
	<p>In this session, we share the journey of MitraClip from an engineer's perspective. It is a story of innovation that takes us from an initial idea to a lifesaving medical device. Mitral regurgitation (MR) is the most common form of heart valve disease in the United States. Nearly 1 in 10 people age 75 and older has moderate to severe MR. MR Initiates a cascade of events progressing to heart failure, then death, if left untreated. Open heart surgery to repair or replace the mitral valve is safe and effective, but it is not an option for many patients who are at high risk for surgery. A minimally invasive, non-surgical approach called Transcatheter mitral valve repair (TMVr) with MitraClip® therapy delivers a treatment option for select high-surgical-risk patients—patients who would otherwise go untreated.</p>	