2017 *FIRST*® Championship Conference

Presented by Southwest, ViaSat & Walt Disney Imagineering

St. Louis, MO April 26-28

Session and Workshop Descriptions

WEDNESDAY, APRIL 26 — AMERICA'S CENTER

4:00-5:00 pm	**LabVIEW Programming for Beginners** Jordan Yamada, Applications Engineer, National Instruments If you are about to become the LabVIEW programmer for your team, or your team is thinking of using LabVIEW for *FIRST* 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.	265/6
4:00-5:00 pm	**Using New Sensors with the EV3: An Example Using the Panasonic Grid-EYE Infrared Sensor** Stefan Op de Beek, Embedded Electronics Hobbyist, and Coach of Team 30377, The Lego Hackerz The presentation shows how to connect new sensors to the EV3 sensor ports from a hardware and a software point of view. Books or blogs describing this process often use alternative programming languages such as RobotC or Lejos for programming the EV3 instead of the native LEGO Mindstorms EV3 graphical language. LEGO released a developer's version of the Lego Mindstorms EV3 language that is capable of programming 'under-the-hood' in Labview code. The guide that comes with this developer's version is very concise and dense with information. To smooth out the steep learning curve, this presentation describes the process of developing native Lego Mindstorms EV3 programming blocks step-by-step. All the steps are shown using simple examples. Eventually, the LEGO Mindstorms EV3 blocks (sensor, display and statistical analysis blocks) that are needed for operating the Panasonic Grid-EYE 8x8 sensor are explained. The presentation concludes with a live demo showing interesting application of this Infrared sensor and showing how simple it is to use by students or FLL team members once the blocks are imported in the LEGO Mindstorms EV3 programming environment.	267

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4:00-6:00 pm

How to become an Automation Professional 274

Steven Pflantz, President, International Society of Automation
Kurtus Kahle, Mechanical Engineer, Richardson & Biskup Consulting Engineers
Teresa Lanuza, Electrical Engineer, Clark Richardson & Biskup Consulting Engineers
Elliott Pennington, Automation Professional
Mike Amendola, Automation Professional
Luke Manier, Automation Professional

There are a lot of exciting and rewarding careers in the field of Automation. This presentation will help you better understand what an Automation Professional is, the variety of jobs and careers out there, and the education and training you need. Our presentation team will talk about what got them interested in a STEM based career, how they chose their education path, how they found their way into their present job, and answer questions about all of that. Think of it as sitting down with 6 people talking about how they got from 6th grade to where they are now as an Automation Professional.

4:00-5:00 pm

The Power of Math and Science Can Make You a Superhero! 275

Jay Flores, STEM Ambassador, Rockwell Automation

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!

4:00-5:00 pm

Effective Student Leadership in *FIRST* Robotics Competition 276

FIRST Robotics Competition Team 1885, ILITE Robotics

Participants will benefit by learning how to effectively lead a team. These skills can be implemented in robotics teams and as life skills that can be used to lead any type of team. The session will also show leaders how to work with other leaders and be effective followers when needed. The session will show participants how to be efficiently organized as a team and ways to split the work load in a positive manner that adequately utilizes each student's skills. Another benefit to our session includes communication and feedback methods with information on effectively choosing the next leadership team.

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5:30-6:30 pm — **Advanced LabView Programming** — 265/6

Greg McKaskle, Chief Software Architect, National Instruments

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.

5:30-6:30 pm — **Change the Gender Equation: The SWENext Partnership with *FIRST*** — 267

Kate Nolan, Materials & Process Engineer, Boeing

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 *FIRST*. For the past three years, SWE has supported 20 *FIRST* 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.

5:30-6:30 pm — **Train All Students to Be Leaders and Good Things Will Happen** — 275

FIRST Robotics Competition Team 33, The Killer Bees
Jim Zondag, Application Development Manager, Uconnect System for Fiat Chrysler Automotive, LLC and Team Leader for *FIRST* Robotics Competition Team 33, The Killer Bees
Julia Green, Senior Business Analyst, Student Information Systems and Mentor, *FIRST* Robotics Competition Team 33, The Killer Bees

The Killer Bees have doubled their rate of female participation in the last six years by including all students in technical leadership roles on and off the field. This presentation will detail our lessons learned on recruitment, training, leadership, culture change and how using formal sub-teams created an unexpected outcome.

5:30-6:30 pm — **Strategies for Effective Prototyping in *FIRST* Robotics Competition** — 276

Chris Picone, Mechanical Engineer/Project Manager, Sea Box Inc

This presentation explores the art and science of prototyping in the context of the *FIRST* Robotics Competition build season. Building useful prototypes helps any team determine important design parameters early in the build process. Prototyping effectively results in a more successful "first iteration" of the competition robot that plays the game effectively throughout the season. Topics covered in this discussion include brainstorming, objective-setting, prototype design, construction, iteration, and evaluation.

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7:00-8:00 pm | **Mentoring for Diversity and Inclusion in *FIRST*** | 265/6

Andy Baker, President, AndyMark
Chris Fultz, Head of Program Management, Defense, Rolls-Royce

Yes, this is two white guys presenting about diversity. We're both *FIRST* mentors, fathers, and husbands, empathetic for the lack of diversity within *FIRST* teams, but hopeful about the improvements the *FIRST* community is experiencing in this area.

7:00-8:00 pm | **Calling all *FIRST* Volunteers! Tell us what you want!** | 267

Sonya Shaver, Volunteer Recognition Specialist, *FIRST*
Leah Quimby, Volunteer Communication Specialist, *FIRST*

FIRST volunteers will have the opportunity to speak to *FIRST* 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 *FIRST* swag!

7:00-8:00 pm | **Why *FIRST* LEGO League Belongs in the Classroom or Why a Patent Proposal Makes a Great Writing Assignment** | 274

Caroline Hanson, Enrichment and Robotics Teacher, Aspen Middle School

Share the journey of incorporating *FIRST* LEGO League into our middle school curriculum and creating a framework for daily classroom work for grade-level teams in a 5 – 8 building. Attendees will be provided with resources, links, and ideas to bring *FIRST* LEGO League into the classroom as a worthwhile project-based learning endeavor. Attendees can expect examples of assignments, activities, and materials that can be used in a classroom setting which align to Common Core standards in reading, writing, speaking, and research skills as well as math practices for robotics and social-emotional development through Core Values work. We will demonstrate how core values activities can be part of any classroom experience and why the components of *FIRST* LEGO League are particularly in line with middle school whole child philosophies, project-based learning, and 21st Century Skills. Expect to leave ready to push for *FIRST* LEGO League in schools!

7:00-8:00 pm | **More Than Honeycomb and Antennae: How to Build a Great Robot and a Sustainable *FIRST* Robotics Competition Team** | 275

FIRST Robotics CompetitionTeam 33, The Killer Bees
Jim Zondag, Application Development Manager, Uconnect System for Fiat Chrysler Automotive, LLC and Team Leader for *FIRST* Robotics Competition Team 33, The Killer Bees
Julia Green, Senior Business Analyst, Student Information Systems and Mentor, *FIRST* Robotics Competition Team 33, The Killer Bees

Building a great robot and influencing students into STEM careers is hard, but it can also bee fun. Join the mentors and students from the Killer Bees on how they design, develop, write requirements and project plans, prototype and modularize designs, do the math and get the robot moving.

7:00-8:00 pm

Building and contributing to WPILib Suite 276

Brad Miller, Director *FIRST*/ WPI Research Group, Worcester Polytechnic Institute
Jonathan Leithschuh, WPI Alum, Coauthor of GRIP, Initial developer of WPILib test suite
Sam Carlberg, GRIP developer, WPILib tools developer
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

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.

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THURSDAY, APRIL 27 — AMERICA'S CENTER

8:30-10:30 am

Growth of *FIRST* Robotics Competition in Rural School Districts—Stability, Sustainability, and Success — 274

Rose Barra, Team Leader, *FIRST* Robotics Competition Team 20
Sydney Walker, Student Lead Programmer, *FIRST* Robotics Competition Team 20
Christine Hoffer, Team Leader, *FIRST* Robotics Competition Team 5236

For the past several years *FIRST* Robotics Competition Team 20 has recognized the challenges faced by rural school districts. We have worked hard to help teams compete. We will set some context including sharing demographic data of our region. We will share our strategies for improving competitive success and sustainability with districts in upstate NY. We will then open the discussion and collectively elucidate success strategies that can be replicated and expanded throughout *FIRST*.

9:00-10:00 am

Teambuilding: Build Your Team Before You Build Your Robot - Part 1 — 265/6

Kathie Kentfield, Director, NEMO (Non-Engineering Mentor Organization)

Big or small, most *FIRST* Robotics Competition teams find themselves populated with a group of unique, talented individuals - many of whom are glad to work individually on their own projects. It can be a challenge to get everyone together for meetings, let alone to work together on tasks! In this forum, you will learn about different kinds of teambuilding exercises, learn why teambuilding is so important, and obtain tips for planning a fun-filled Teambuilding Weekend. Bring back some great ideas to develop your group of students and mentors into a cohesive team prior to the Build Season.

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9:00-10:00 am

Building A *FIRST* Team with Girl Scouts: A Case Study 275

Dianne Stevens, Senior Content Developer, ARRIS, Troop Leader and *FIRST* LEGO League Coach

Two tenets of *FIRST* LEGO League strategy and design—Keep It Simple and Build on Existing Solutions—can help team organizers increase the number of elementary school girls in *FIRST* STEM programs. Organizers can Keep It Simple, by starting with an all-girl group and they can Build on Existing Solutions by partnering with an established youth organization. A partnership with the Girl Scouts of America can help to accomplish both. In this session, you'll hear about the path one Girl Scout troop took to form its own *FIRST* LEGO League team, how this activity furthered and supported the core values for both organizations, the practical effect of the partnership on regular operations, and most importantly, the experiences of the girls themselves.

9:00-10:00 am

Open-Source Robot Sensor Fusion: IMU, Quadrature Encoders, Vision Processing and LIDAR 276

Scott Libert, Founder, Kauai Labs; Software/Control System Mentor, Team 2465 (KauaiBots); Control System Adviser

Tim Easterling, LabVIEW Developer, Kauai Labs; Programming/Electrical Mentor, Team 6043 (Allegan Tigers)

Via the SF2 Sensor Fusion Framework Initiative, Kauai Labs goal is helping *FIRST* 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 *FIRST* Robotics Competition teams in open-source, easy-to-use packages including training materials and examples, helping FRC teams Build Better Robots.
Join us to discuss SF2 and its relationship to navX-MXP/navX-Micro and technologies including ROS and Cloud Computing.

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 Ferrara Theatre

Ammi Ludwick, Program Director, Aspirations in Computing Recognitions

John Kelly, Regional Affiliate Manager, Aspirations in Computing

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 *FIRST* community as change agents.

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10:30-11:30 am | **Putting the *FIRST* Fundraising Toolkit to Work for Your Team** | 265/6

Renee Becker-Blau, Executive Director of Indiana*FIRST*
Evan Hochstein, *FIRST* Senior Mentor of Minnesota

Each *FIRST* team has different mentors, parents, students, and community engagement opportunities. The *FIRST* Fundraising Toolkit offers excellent advice on how to create a team fundraising plan with fill-in-the-blank resources, videos, and example fundraisers from teams within *FIRST*, but how do you put the *FIRST* Fundraising Toolkit to work for your team, in your community, and with the resources you currently have? During this session, we will review fundraising plans, discuss community analysis, start your sponsor packet, and learn how NOT to present your team to a business.
Join us, bring paper & a pen, and start a fundraising plan for your team!

10:30-11:30 am | **Getting into Grantworld - Resource Development for Robotics** | 275

Melody Ricci, Regional Director, Wisconsin *FIRST*

Grants can be a daunting and time consuming endeavor. This presentation will provide information for those who have wondered how to "Get into Grantworld" and provide practical techniques on where to search for grants and the next steps once you find the perfect grant opportunity. Grant elements that are common to most proposals will be reviewed including the needs statement, program goals, objectives, evaluation plan, and project sustainability. Writing a grant is just the *first* step. Stages of the grant application process will be explored along with how to take the extra steps of forming purposeful partnerships, and responding effectively to each unique funding opportunity. Resources will also be shared utilizing the *FIRST* Fundraising Toolkit for proposal & program success.

10:30-11:30 am | **KNOW YOUR OPPONENTS and PARTNERS - Learn Scouting Strategies and How to Use Tableau for Improved Decision-Making** | 276

Andrew Raine, Manager, Fiat Chrysler Automobiles, Coach
Ghassan Kridli, Parent Mentor
FIRST Robotics Competition Team 2834

This session will explain how any team can create powerful metrics for scouting, how to make better and faster decisions using Tableau, and how to effectively use scouting data for alliance strategy. It will include an overview of data collection methods, how to import data to create basic visualizations in Tableau, how to use available on-line published metrics from Team 2834, and how to apply this information in the competition.

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10:30-11:30 am	**The Top 20 Robots in *FIRST* Robotics Competition History** Andy Baker, President, AndyMark This presentation highlights 20 of the best robots in the history of the *FIRST* Robotics Competition. Stories and videos will describe why these trend-setting, inspiring robots impacted the direction of *FIRST* Robotics Competition robot design and performance. Students and mentors who are into FIRST history will be interested in this presentation by long-time *FIRST* mentor Andy Baker.	Ferrara Theatre
11:00-1:00 pm	**Teambuilding: Build Your Team Before You Build Your Robot - Part 2** Kathie Kentfield, Director, NEMO (Non-Engineering Mentor Organization) As a follow-up to Teambuilding Part 1, in this hands-on session participants will engage in teambuilding exercises they can take back to their teams. **Limited to 30 people.**	274
12:00-1:00 pm	**How to Make Your *FIRST* Team Valuable to Your School District** *FIRST* Robotics Competition Team 1629, The Garrett Coalition (GaCo) *FIRST* Robotics Competition Team 1629 would like to share their "STEM Waypoints" initiative which helps establish the team's vision of preparing every child with the experiences they need to be successful in STEM, or in other words - to be "STEM Ready." The STEM Waypoint program, taught by *FIRST* Robotics Competition students, targets ALL students in grades three through seven in the team's county-wide school district, providing each student with a unique and engaging STEM experience at each grade level. All STEM Waypoint lessons are research and standards based, measurable and many use LEGO®. STEM Waypoint lessons are taught by 1629 students and every lesson is designed to serve as a memorable "waypoint" in each student's STEM journey.	265/6
12:00-1:00 pm	**Alpha Omega Epsilon: A Sisterhood of Engineers and Technical Scientists** Rachel Wilk, Clinical Engineer, Manchester VA Medical Center We will be discussing the history of Alpha Omega Epsilon, as well as our favorite memories in the sorority and how being part of this sisterhood enriched our college experiences, both professionally and socially. If you are a young woman graduating high school and/or thinking about pursuing a STEM degree at a university, you may want to stop by this seminar and learn about a great organization that strives for friendship, leadership, and professionalism.	267

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12:00-1:00 pm	**Controlling System Voltage Drops with Physical Models** Chris Gerth, Software Mentor, *FIRST* Robotics Competition Team 1736 Aaron Thune, Alumni & Student, *FIRST* Robotics Competition Team 1736 Preventing low system voltage is a key concern for high-power drivetrains in *FIRST* Robotics competitions. For the 2016 competition season, *FIRST* Robotics Competition Team 1736 implemented a physics-based algorithm to predict and prevent brownout conditions. The algorithm, underlying concepts, and results will be covered.	275
12:00-1:00 pm	**Creating *FIRST* Communities of Practice - lessons learned over 10 years from the Baltimore Area Alliance (BAA)** Jenny Beatty, Volunteer Director, STEMaction, Maryland A decade ago the Baltimore Area Alliance (BAA) was formed by a group of *FIRST* Robotics Competition teams in the Baltimore area with the goal of supporting each other and helping rookie teams. The BAA has now updated its mission and re-branded as the Maryland Robotics Alliance (MRA). The MRA hosts an Education Day, an off-season competition (the Battle O' Baltimore) and the fun Back-to-Build Mentor Dinner, along with supporting each other. Come hear about the lessons learned over the years.	276
12:00-1:00 pm	**"Cruise Control" for Combines** Jeremiah Johnson, Design Engineer – Advanced Engineering, John Deere Global Crop Harvesting Product Development Center "Cruise Control" for Combines – The design process to automate complex harvesting activities. From adapting old technology to developing new technology, developing a combine cruise control system required innovation to meet many challenges.	Ferrara Theatre
1:30-2:30 pm	**Creating and Utilizing Sustainable Growth on your *FIRST* Robotics Competition Team** *FIRST* Robotics Competition Team 1325, Inverse Paradox *FIRST* Robotics Competition Team 1325 is a team experiencing continuous growth in their student, mentor and alumni population. Due to their size, it may seem hard to manage and engage all participants but through implementing strategies, developing new organizational structures and radical redesign of the student leadership system, *FIRST* Robotics Competition Team 1325 has not only been able to sustain this growth, but direct it into notable success. Whether your team is just starting or if you already have more numbers than you believe you can handle, *FIRST* Robotics Competition Team 1325 will offer insight on their struggles and how they overcame their challenges so you and your team can skip right to a solution.	265/6

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1:30-2:30 pm	**Lending a Hand: 3D Printing Prosthetic Hands** Jordan Sayegh, Community Service Coordinator, Prosthetic Hand Project Lead Amal Elhelw, *FIRST* Robotics Competition Team 1511, Rolling Thunder Jen Owen, Founder, e-NABLE Maria Esquela, Founder, e-NABLE in Maryland This conference will take the audience through the project of 3D printing a prosthetic hand. We will cover the history of e-NABLE, a non-profit organization that is the source of this project. Our presenters will provide the key steps of 3D printing a prosthetic hand, followed by several comprehensive ways to get involved. We will also have the founders of e-NABLE present with us. They will share their story of how inspiration from a steampunk prop (which coincides with the 2017 game, *FIRST* STEAMWORKS℠) evolved into a global organization to "lend a hand" around the world.	267
1:30-3:30 pm	**Advocacy = Outreach faster than one person at a time! We need your help!** Don Bossi, President, *FIRST* Jim Burger, Thompson Coburn, *FIRST* Lobbyist Steve Hyer, *FIRST* National Advocacy Conference Founder Mark Lawrence, *FIRST* Robotics Competition Team 1816, Founder, Minnesota Advocacy Conference Kevin Killian, Head Coach/Mechanical Mentor, *FIRST* Robotics Competition Team 1676, Pascack Pi-oneers and Founder, New Jersey Advocacy Conference Jack Teadore, Coach/Programming and Electronics Mentor, *FIRST* Robotics Competition Team 1676, Pascack Pi-oneers and Founder, New Jersey Advocacy Conference You will learn how to develop an advocacy program with your team to develop relationships with policy makers locally, in your state Capital, and in Washington, DC to dramatically extend your team's reach and expand STEM opportunities for kids both in your community and across our nation! Hear from *FIRST* President Don Bossi and *FIRST* Lobbyist Jim Burger on *FIRST*'s Advocacy Agenda, the *FIRST* National Advocacy Conference Founder Steve Hyer, and *FIRST* Robotics Competition Teams 1676 and 1816 (founders of advocacy conferences in NJ and MN). We will teach you where to start and how to get involved on a broader scale so you can grow your team members into life-long advocates for *FIRST* and STEM! The more teams and students we can get involved in our Advocacy efforts, the faster and more effective they become! Come and find out how you can help!	274

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1:30-2:30 pm	**From Competition to Career: Leveraging *FIRST* Experience in the Job Market** Amy Lynn Hunt, Director of People and Organizational Development, *FIRST* STEM experience is highly attractive to companies and can help set you up for success when it comes to jobs and internships. During this session, learn more about what recruiters look for when hiring, how to highlight your *FIRST* experience in resumes and cover letters, the do's and don'ts of applying, and how to be successful once you land your dream job or internship. Session geared toward students and recent (or soon to be) graduates.	275
1:30-2:30 pm	**How the Makerspace Movement works with STEM & Robotics!** Jennifer Martin, Educator, Chesterfield Day School The Makerspace supports best practices in STEM and Robotics through an emphasis on Collaboration, Communication, Content, Critical Thinking, Computational Thinking, Creativity, & Confidence. The Workshop will focus on defining, layout, culture, support and change in the STEM, Robotics, & Makerspace Movements in Education.	276
1:30-3:30 pm	**Chairman's Chat** John Larock, Coordinator, *FIRST* Robotics Competition Team 365, The Miracle Workerz *FIRST* Hall of Fame Teams Championship Chairman's Award Judges 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!	Ferrara Theatre
3:00-4:00 pm	***FIRST* Impact–A Review of Evaluation Findings from the Longitudinal and Alumni Studies** Nancy Boyer, Ph.D., Director of Research and Evaluation, *FIRST* This session will provide a review of findings from the 4th year of the *FIRST* Longitudinal Study and the recent *FIRST* Alumni Study. Findings indicate that *FIRST* is reaching its goal of getting students excited about STEM, STEM careers and increasing valuable workplace skills. This session will review some of the key findings and provide an understanding of how the data can be used to communicate with school administrators, community organizations, sponsors and others in support of *FIRST* Programs.	265/6

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3:00-4:00 pm	**Using Social Media to Tell Your Story** Jamee Luce, *FIRST* Robotics Competition Team Advocate, *FIRST* Jennifer O'Callaghan, *FIRST* LEGO League Community Engagement Manager, *FIRST* Is your team struggling with a Social Media plan? Are you wondering about the value of having a Facebook or Twitter account? This session is for the beginner in the world of Social Media. We will share best practices about how to manage and maintain a Social Media plan for your team, as well as how to effectively find and/or develop content. We will also discuss how to connect with the *FIRST* Social Media accounts and connect with our community with common hashtags.	267
3:00-4:00 pm	**DIY Intelligence** Murali Gopalakrisha, Head of Product Management for Intelligent Machines, NVIDIA Jesse Clayton, Senior Manager for Product Management for Intelligent Machines, NVIDIA 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.	275
3:00-4:00 pm	**Calling all *FIRST* Volunteers! Tell us what you want!** Sonya Shaver, Volunteer Recognition Specialist, *FIRST* Leah Quimby, Volunteer Communication Specialist, *FIRST* *FIRST* volunteers will have the opportunity to speak to *FIRST* 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 *FIRST* swag!	276

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FRIDAY, APRIL 28 — AMERICA'S CENTER

8:30-2:30 pm	**VIP Educator Summit** Vinnie Rodino, Director of School Engagement, *FIRST* Drew McConnell, Digital Learning Manager, *FIRST* Sherry Comer, Director, Camdenton R-III Afterschool Services and National Afterschool Alliance Ambassador-Emeritus 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.	274
8:30-10:30 pm	**LEGO® Education WeDo 2.0 Workshop** Alisha MacIntyre, International Competitions Manger, LEGO® Education (name TBD) LEAP Teacher Come build and explore **LEGO®** Education's WeDo 2.0. WeDo 2.0 is the platform for *FIRST* **LEGO®** League Jr. teams, and will help the young students begin to innovate, program, build, and learn about the engineering design process. This session will introduce WeDo 2.0 and show how it is used in *FIRST* **LEGO®** League, Jr.	275

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9:00-10:00 am

Your *FIRST* Narrative: Presentation Literacy Skills with TED-Ed 265/6

Ashley Kolaya, Program Manager, TED-Ed

FIRST 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 *FIRST* students now have access to presentation literacy curriculum from these masters of the art! *FIRST* 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).

9:00-10:00 am

VICTOR (Visually Impaired Competitions to Optimize Robotics) 276

FIRST Tech Challenge Team 8728, Bionic Wolves

Our goal is to encourage thousands of students to engage with robotics in a hands-on way for the visually impaired. *FIRST* Tech Challenge Team 8728 invented an innovative way to teach computer code without using computers. This is a new teaching tool that can introduce computer script to children and students with a visual impairment. Our students designed and 3D printed physical blocks that represent computer code using SCRATCH and MIT App Inventor. We offer a unique way to present computer script to children that are hands-on, interactive, and its low cost as it does not require the use of computers. We further adapted versions using braille to support students with visual impairments in learning how to assemble computer code to understand robot function during competitions. *FIRST* Tech Challenge Team 8728 has plans to create and implement *FIRST* VICTOR (Visually Impaired Competitions to Optimize Robotics) with local partners that support the visually impaired.

9:30-10:30 am

World's Fastest Juggler Attempts Another Guinness World Record Ferrara Theatre

David Rush, MIT graduate, Technology Professional, 12-time Guinness World Record Setter

David Rush, an MIT graduate, a technology professional, and a 12-time Guinness World Record breaker will share his STEM (Science, Technology, Engineering, and Math) story told through juggling, balancing, and impossible feats while espousing the power of a growth mindset culminating with an attempt to break the Guinness World Record for "most juggling catches in one minute blindfolded (three balls)". The current record is 364 catches in 1 minute (over 6 catches per second). www.DavidRush4STEM.com

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Session and Workshop Descriptions

10:30-11:30 am | 265/6

Impact Outreach Opportunities equals STEM excitement!

FIRST Tech Challenge Team 5975, Cybots

This workshop will provide an overall view of numerous outreach opportunities that teams can adapt to any organization willing to give students the opportunity to explore, experience, and challenge themselves in STEM education. Participants will have the opportunity to explore various hands-on activities that Cybots use to conduct STEM Camps. Each participant will leave the workshop with ideas and materials to assist them with the development of STEM Camps and other community outreach opportunities for students.

10:30-11:30 am | 276

Lens of Invention with the United States Patent and Trademark Office

Juan Valentin, Education Program Advisor in the Office of Education and Outreach (OEO), United States Patent and Trademark Office (USPTO)

Through historic and modern stories of invention (including some stories of youth, including *FIRST* students), join Juan Valentin, an Education Program Advisor in the Office of Education and Outreach at the United States Patent and Trademark Office, as he illustrates how anyone can solve a problem through critical and innovative thinking. Wondering how to protect your latest invention through the patent process? Drawing on his experience in the Office of Education and Outreach and 12 years as a patent examiner, Juan will share his top 3 tips of what anyone considering filing a patent application should know before hitting the send button. You'll leave inspired and with a renewed understanding that an innovative mindset is the most important element of successful inventing.

11:00-1:00 pm | 275

Inclusion in *FIRST*: Supporting Tomorrow's Innovators

FIRST Robotics Competition Team 1710, Ravonics Revolution

In today's global economy, inclusion and diversity are much more than simple buzzwords; they are critical aspects of successful teams, businesses and communities. To help *FIRST* teams address these issues, Team 1710 will discuss successful diversity-focused programs such as You Go Girl, STEM Connection, and Rainbow Alliance to highlight methods that foster a more inclusive team culture. Workshop attendees will identify areas of need regarding diversity on their own teams and will have access to resources and advice with which to develop inclusion strategies.

2017 *FIRST*® Championship Conference

Presented by Southwest, ViaSat & Walt Disney Imagineering

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Session and Workshop Descriptions

11:00-1:00 pm	**"WOMEN IN STEM…. Things We Want You to Know!" An Interactive Discussion with Women Leaders in Technology** *Carla Proulx, Alliances Manager, FIRST* *Professional Women from the Air Force, Automation Federation/ISA, Booz Allen Hamilton, Caterpillar, J.R. Automation, John Deere, Monsanto, Rockwell Automation, Society of Women Engineers (SWE), The Boeing Company, University of Kansas, Veteran's Administration (VA) Healthcare Systems* Prominent career women working in technology fields and *FIRST* 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.	Ferrara Theatre
12:00-1:00 pm	**How to Win Awards in *FIRST* Robotics Competition** Kristine Atiyeh - Mentor *FIRST* Robotics Competition Team 125 Whether you're a rookie or an original and sustaining team, this presentation will give you a new outlook on submission based, technical and team awards! This is a detailed guided tour on how to understand each award and how to best apply and present. Included in this presentation is what awards can do for your team, key phrases, interview tips from a World Championship Dean's List Winner, and much more! We will go over each award in detail and how to prepare during the pre-season, build season, competition season and postseason.	265/6
12:00-1:00 pm	**How to Utilize 3D Printing to Customize and Expand your Robot's Capabilities** Evan Hochstein, Applications Engineering Technician, Stratasys and *FIRST* Senior Mentor Learn about professional and manufacturing grade 3D printers from Stratasys' North America Applications Engineering team. Evan Hochstein, *FIRST* Senior Mentor, *FIRST* Alumni and Stratasys Applications Engineering Technician will be presenting on how to utilize Stratasys 3D printers to design, prototype and fabricate parts for *FIRST* Tech Challenge and *FIRST* Robotics Competition teams.	276

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1:00-1:40 pm — **Live Coaching Your FIRST story with TED-Ed and Abbott** — Dome 261/2

Ashley Kolaya, Program Manager, TED-Ed
Jamey Jacobs, Divisional Vice President, Global Product Development, Abbott Vascular

Have you always felt like shouting your FIRST 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 FIRST 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 FIRST 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.

If you want to volunteer to be one of the students to get live coaching from Ashley and Jamey, please come prepared with an idea for your TED-talk narrative.

1:30-2:30 pm — **Active Alumni 101** — 265/6

Kija Davis, President, Purdue *FIRST* Programs

Helping high school seniors discover how to be involved with *FIRST* for life after graduation and how to work it into their schedules to best benefit themselves and the program.

1:30-3:30 pm — **Learning through Play with the LEGO Foundation** — 275

Casper Aarlit Jensen, Facilitation Manager, LEGO Foundation

At the LEGO Foundation, we are dedicated to building a future where learning through play empowers children to become creative, engaged, lifelong learners. We are putting play on the agenda and spreading the word about play's importance for child development. When we talk about play – we naturally talk about learning too. Here is your opportunity to get a taste of the LEGO DNA. Please join the Learning through Play workshop, where we will look at:

- What is Play?
- What is so special about Play?
- Inspiration and ideas on Learning through Play.

Most of the workshop will be hands-on minds-in, so please show up open-minded ready to play, learn and share.

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1:30-2:30 pm	**Don't Doubt the Scout: The Subliminal and Often-Neglected Key to *FIRST* Robotics Competition Success** Jayasurya Sridharan, Scouting Captain, *FIRST* Robotics Competition Team 4096 "Ctrl-Z" It's always there, yet few ever realize it; Scouting plays an enormous, yet often overlooked, role in the FRC experience. In this session, learn how to design, develop, implement and utilize this invaluable upper hand.	276
1:30-3:30 pm	**Strategies for using computer vision in *FIRST* Robotics Competition** Brad Miller, Director *FIRST*/ WPI Research Group, Worcester Polytechnic Institute Jonathan Leithschuh, WPI Alumni, Coauthor of GRIP, Initial developer of WPILib test suite Sam Carlberg, Developer of GRIP and WPILib tools 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.	Ferrara Theater
3:00-4:00 pm	**The Journey of MitraClip: A Story of Innovation** Jamey Jacobs, Divisional Vice President, Global Product Development, Abbott Vascular 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.	265/6

3:00-4:00 pm

Partnering with your School District: Utilizing School District Resources to Create a Sustainable Model for Growing *FIRST* in Your Community

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Dr. Heidi Kattula, Executive Director of District and School Services, Oakland Intermediate School District, *FIRST* LEGO League, Jr. Coach
Sarah Piper, Operations, Clinton River Medical, Parent Mentor of *FIRST* Robotics Competition Team 2834 Bionic Black Hawks, Bloomfield Hills High School
FIRST Robotics Competition 2834, The Bionic Black Hawks

Do you have a goal to implement *FIRST* LEGO League, Jr., *FIRST* LEGO League, *FIRST* Tech Challenge and *FIRST* Robotics Competition in your community? Are you struggling to "get the word out" about *FIRST* robotics? Do you have a few parent volunteers trying to organize and find mentors for many *FIRST* teams? Do you have a path for students and mentors to progress through all levels of FIRST? In 2012, *FIRST* Robotics Competition Team 2834, The Bloomfield Hills High School Bionic Black Hawks set a goal to implement all four levels of *FIRST* Robotics in their school district. In just four years, the Black Hawks have grown from supporting 6 to 49 *FIRST* teams. This represents over 350 students participating on *FIRST* LEGO League, Jr., *FIRST* LEGO League, *FIRST* Tech Challenge and *FIRST* Robotics Competition teams in the 2016-17 season.