

Chairman's Award - Team 1477

Team Number

1477

Team Name, Corporate/University Sponsors

Baker Hughes/ABB/ETSZONE/Laird Plastics/Conroe ISD/Halliburton/Anadarko/NRG/NEMA Enclosures/Crow Corp/Sherry and Alan Coats/Texas Workforce Commission/FIRST in Texas/DS SolidWorks&College Park H S

Briefly describe the impact of the *FIRST* program on team participants with special emphasis on the 2016/2017 year and the preceding two to five years

Texas Torque encourages all students to embody the ideals of FIRST, which is why 100% of students attend college and major in STEAM. Our open membership policy and near 50/50 gender ratio allow for every student to access all the opportunities STEM offers. FIRST has opened doors for students to attend universities like Harvard, MIT, CalTech, CMU, West Point, and UT. Texas Torque alumni volunteer at regionals, mentor other FRC teams, and have even interned at FIRST Headquarters and SpaceX.

Describe the impact of the *FIRST* program on your community with special emphasis on the 2016/2017 year and the preceding two to five years

We have worked with our community to pass an education bond, allocating \$5.2M for the creation of four robotics labs in our area, the largest of which is a \$2.5M center located at our campus. The creation of these labs allows for a new engineering class, which our lead mentor has greatly shaped, in addition to the electronics and robotics curriculum. To recognize the impact of FIRST in our community, we worked with local government to create The Woodlands Robotics Day in 2014.

Team's innovative or creative method to spread the *FIRST* message

We reach new audiences through outreach, media, and sports partnerships. In the last 5 years, we reached over 700K people through outreach events. In 2013, we reached 25.2M on national TV in Macy's Thanksgiving Day Parade and FOX & Friends; in 2015, 2.2M through U-Verse's documentary RoboLeague; and in 2016, 300K in features by NRG, KHOU and the ZombieGoBoom YouTube channel. By partnering us with the Houston Astros and other major sports teams, our sports initiative has expanded our reach.

Describe examples of how your team members act as role models and inspire other *FIRST* team members to emulate

Our students are capable and involved- in the past 5 years we have had 11 National Merit finalists, 14 Eagle Scouts and 5 Intel ISEF finalists. We also strive to be role models for our community by reaching out to government. As one of the founding teams of the STEM Advocacy Conference of Texas, we visited the Texas State Capitol in 2016 to discuss STEM education with state legislators. After winning the 2013 World Championship, we were recognized by Texas Senate, House, and Governor Rick Perry.

Describe the team's initiatives to help start or form other FRC teams

With the assistance of an alumnus, we introduced FRC to Norway. We helped our pre-rookie FRC team build a copy of our 2014 robot, which was presented to the Minister of Technology at Norway's national tech conference and to FIRST Scandinavia. Locally, we advocated for the passage of a bond to create 4 new robotics centers, aimed at supporting FIRST teams and creating FRC teams. We also provided an off-season robot and start up advice to a nearby pre-rookie team, joining this season as Team 6547.

Describe the team's initiatives to help start or form other *FIRST* teams (including Jr.FLL, FLL, & FTC)

We host a summer LEGO Robotics camp to introduce children to basic mechanics and EV3 programming. Through this camp, children are inspired to participate in FLL. Since our lead mentor is the District Robotics Instructional Coach, he focuses on the creation and sustainability of FLL teams. Through the team's outreach efforts, and our mentor's guidance, the number of FLL teams in our school district has grown from 3 teams to 63 teams in the last several years.

Describe the team's initiatives on assisting other *FIRST* teams (including Jr.FLL, FLL, FTC, & FRC) with progressing through the *FIRST* program

We focus on providing opportunities to further the experience of FIRST robotics. Our FLL Qualifier is the largest in Texas and continues to grow, from over 40 teams in 2015 to over 50 in 2016. In addition, to provide teams with more practice, we created one of the first off-season FLL competitions in Texas, Spring FLLing. At competitions, we actively seek to assist teams with any issues by providing parts or expertise, and we have even provided a translator for foreign teams.

Describe how your team works with other *FIRST* teams to serve as mentors to younger or less experienced *FIRST* teams (includes Jr.FLL, FLL, FTC, & FRC teams)

In the past 5 years, Texas Torque has mentored 38 FLL teams. We have also worked with FLL teams in Scandinavia, in addition to helping our Norwegian pre-rookie FRC team. At The Remix, the annual FRC off-season competition that we run and host, we have held workshops over roboRIO beta testing, Chairman's, FIRST UIL in Texas, and even MC training led by Einstein MC Blair Hundertmark. Additionally, we publish resources on our website and send the contents of our safety program to interested teams.

Describe your Corporate/University Sponsors

Halliburton/NRG/Anadarko/Conroe Independent School District/NEMA Enclosures/Subsea 7/Crow Corp/Sherry & Alan Coats/Texas Workforce Commission/DS SolidWorks/Purpleheart Armoury/Keith & Lauren Schilling/Scott & Suzanne Rippetoe/Laird Plastics/FIRST in Texas/ETS Zone/Baker Hughes

Describe the strength of your partnership with your sponsors with special emphasis on the 2016/2017 year and the preceding two to five years

Texas Torque works closely with our sponsors. They mentor, provide scholarships, and even offer internships that then become job opportunities. To thank our sponsors and keep them updated on team accomplishments, we invite them to an annual Sponsor Open House where we present them plaques honoring their support. In addition, we often attend our sponsors' events, such as Anadarko Children's Day, Halliburton's international meeting, HalAcademy, and the NRG FIRST Robotics Football Showcase.

Describe how your team would explain what *FIRST* is to someone who has never heard of it

FIRST is a robotics program dedicated to inspiring students of all ages to explore and embrace the principles of STEM through a series of competitions. By emphasizing the importance of collaboration, it pairs professionals with motivated students to show the importance of STEM in a modern world. By equipping the next generation with knowledge, FIRST provides a place for passionate individuals who want to improve their skills and challenge themselves.

Briefly describe other matters of interest to the *FIRST* judges, if any

We give back to the community. Partnering with Angel Reach, we helped renovate a home and donated bedding through our annual drive at The Remix. We also demoed at a local Women's Shelter and consistently volunteer at their thrift store. To raise funds for this shelter, we have donated all of the profits from The Remix over the last 2 years, giving \$1500. For the past 2 years, we have worked with our local FLL teams to host an annual LEGO drive, donating 80 LEGO kits to hospitalized children.

Team Captain/Student Representative that has double-checked this submission.

Claire Zhang

Essay

When people think community, they rarely think of a robotics lab. While an environment dedicated to mechanics and electronics may at first seem distant and cold, Texas Torque challenges this mindset by developing a culture of inclusion within our team. Coming from seven different schools and a variety of backgrounds, every builder, artist, athlete, and writer has a space in our lab. We support all interested minds, providing financial aid for those who need it, peer tutoring for struggling students, and a family for anyone to be part of. We make it our goal to spread these same opportunities to inspire the next generation. Every curious mind deserves a chance at success and learning for the future. It all begins with Texas Torque.

We open doors for young students to explore STEM as an investment in the next generation of scientists and engineers. Because of this, we strive to increase the presence of FLL in our community. Since 2013, the number of FLL teams in our area has increased from 3 to 63, making FLL accessible to hundreds of students across our district. Over the past several years, our members have mentored 38 of these teams, using their knowledge to provide guidance and support. In addition to fostering the growth of FLL, we run and host the largest FLL qualifier in Texas, as well as one of the only FLL off-season events in the state. Our LEGO EV3 summer camps offer 3rd through 6th graders a fun, interactive introduction to FIRST and STEM, and the increasing popularity of FLL in our area has allowed 7th and 8th grade

students to complete part of their Pre-AP science curriculum by participating in FLL. The skills that children learn in FLL set them up for success in high school and FRC.

In addition to working with FLL, we extend our support to other FRC teams. In 2015 and 2016, we were one of 76 teams selected by National Instruments to beta test the roboRIO control system. We published information about the roboRIO on our website, along with other resources such as our robot code, scouting data, and safety program. Also available on our website are Torque Tutorials, a series of videos on topics such as tapping and gearbox assembly. At our annual off-season event, The Remix, we run and host a series of workshops covering roboRIO beta testing, the Chairman's Award, and even MC training led by Einstein MC Blair Hundertmark. The Remix has drawn in teams from across the state and as far as Louisiana, Mexico, and Illinois. At The Remix, we provided one of our robots, as well as technical assistance and drive coaching, to pre-rookie team 6547 to help them gain experience. Previously, we worked with team 6547 to assist them in infrastructure development. By making resources available to other FRC teams, we enable more people to get involved in FIRST by providing them with the resources and knowledge they need to succeed.

Beyond spreading the FIRST experience to other members of our community, we have reached out to people all across the globe in order to inspire more people to pursue STEM. Our alumnus, the chair of the Kongsberg FLL committee, has created FLL programs throughout Norway's Buskerud region. In addition to promoting the development of FLL in the region, we have also assisted a pre-rookie FRC team by sending the CAD and materials from our 2014 robot to give the team experience with the build process. On top of sending sheet metal and electrical components, we had students Skyping the team to help them with their design process. This assembled robot was then presented to the Norwegian Minister of Technology at Norway's national technology conference. Since then, it has been presented to FIRST Scandinavia to develop the infrastructure for FRC in Norway. From our work with FLL to FRC and from our local area to our global reach, we have made STEM education borderless.

Within our school district, we spread STEM through our involvement in the district science program, as well as our work with the school board. Students from our team campaigned for the inclusion of robotics facilities in a 2015 bond referendum that led to the creation of four new robotics labs, the largest of which is a \$2.5M robotics center to be built at our own campus by March of 2017. Texas Torque team members then drew up renderings of the new facilities and advocated for the addition of new machinery such as a Tormach mill, table routers, and lathes. While our students engage the community, our lead mentor works with the district science curriculum and serves as the district robotics coach. Thanks to his guidance and our team's open-membership policy, every student who enters our lab has the opportunity to experience everything FIRST and STEM have to offer. From the youngest rookie to the most seasoned veteran, every student on Texas Torque works to explore and promote STEM as part of our team.

To give back to our community, our students work with local organizations to help those in need. We have held demonstrations at our local women's shelter and regularly volunteer at their thrift store. Over the past few years, we have given all profits from The Remix to the shelter, totaling over \$1500 in donations. At The Remix, we also hold a bedding drive to benefit Angel Reach, a local charity supporting foster youth. In 2015, we worked with Angel Reach to renovate a home for a foster family. To help others in need, we hold an annual LEGO drive at our FLL qualifier, working with local teams to collect over 80 LEGO sets for hospitalized children over the past two years. Through our work with local organizations, our team strives to reciprocate our community's support.

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As we give back, we strive to Make it Loud through our community outreach, reaching over 700K people in the last five years. At Texas Torque, we aim to inspire students at a young age by demonstrating at elementary schools. Through events such as the SCI://TECH Exposition, Boy Scout Robotics Merit Badge camp, and demos at high school orientations, we reach out to students of all ages. Beyond this, we participate in our township's annual Fourth of July parade, as well as the 2016 TEDx The Woodlands event, Girl Scouts Pi Day event, and more. Outside of our local area, we demo annually at Comicpalooza, the largest comic and pop culture event in Texas; at SpaceCom, an international space exposition; and at the Houston Mini Maker Faire. For the past several years, Texas Torque has reached thousands through local newspapers such as the Houston Chronicle and The Villager. By reaching out to our community and beyond, Texas Torque strives to promote FIRST and STEM.

Beyond impacting our local area, our team works to expand our influence in all levels of government in order to make STEM education accessible to everyone. After winning the 2013 World Championship, we were recognized in resolutions by the Texas Senate and House (Senate 44 and House 13R3581) and by Governor Rick Perry. Our representative in the Texas House, Steve Toth, toured our lab in 2014, the same year we established The Woodlands Robotics Day within our township. The following year, U.S. Congressman Kevin Brady spoke in the opening ceremonies at The Remix. Additionally, our lead mentor traveled to the Texas State Capitol to advocate for the inclusion of robotics in Texas UIL, which launched in 2016. More recently, members of Texas Torque visited the state capitol to discuss STEM education with legislators as founding members of the STEM Advocacy Conference of Texas, a bi-annual

conference that advocates education in STEM. Our work with the government enables us to make a lasting impact and expand the reach of STEM education.

Beyond giving STEM education a voice in government, we expand our reach to new audiences through our partnerships with major sports teams. Since 2013, we have hosted an annual event called FIRST Pitch through our partnership with the Houston Astros. In addition, we held a joint demonstration with James "The Beard" Harden of the Houston Rockets at our local Microsoft center in 2015. More recently, through the NRG FIRST Robotics Football Showcase, we have been broadcasted alongside the Houston Texans. This February, we demoed at Discovery Green in downtown Houston for Super Bowl LIVE, allowing thousands of parents and children to get hands-on experience with our robot. By partnering with major sports teams, Texas Torque has given new audiences the chance to experience STEM firsthand.

To put FIRST and STEM into the national spotlight, we strive to Make It Loud through our appearances in media. After winning the 2013 World Championship, the team had the honor of cutting the ribbon to open Macy's Thanksgiving Day Parade, reaching 25.2M people on national television. We were then featured on FOX & Friends, reaching another 1.6M viewers. In 2015, Digital Kitchen chose us to represent FIRST in their documentary RoboLeague, reaching AT&T U-Verse's 4.3M subscribers. For this past year, we starred in NRG's FIRST Robotics video series, appeared on KHOU and other news outlets for the NRG FIRST Robotics Football Showcase, and were featured in a YouTube video by ZombieGoBoom, reaching almost 300K people. Through our efforts in media, we work to generate excitement for FIRST and STEM on a national level.

It may seem difficult for one robotics team to represent the leaders, innovators, and educators of tomorrow. In response, we let our actions speak for themselves. Although our team has grown and spread tremendously over the years, this growth has not stopped us from taking in every interested individual and giving them a chance to experience STEM. We have reached across the nation and beyond to spread our team's message, encouraging each student that enters our lab to reach their full potential. We are Texas Torque. Students today, leaders tomorrow. Our impact goes beyond education. By creating opportunities for discovery and growth, we secure the foundation of a better and brighter future.