

Chairman's Award - Team 1678

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2018 - Team 1678

Team Number

1678

Team Name, Corporate/University Sponsors

UCD Chancellor's Office/Davis Joint Unified School District/NVIDIA/Markforged/Innovation FIRST International/Apple/UCD School of Medicine/UCD College of Agriculture and Environmental Science/UCD School of Biological Sciences/First Street Realty/UCD College of Engineering/Hill Engineering/DMG Mori/UCD College of Letters and Science/UCD Global Affairs/Fastenal/Martin's Metals/Aerometals/M. Cubed/Sunpower/Greenbotics/Bright Funds Foundation/West Coast Products/Da Vinci Boosters/Far Western/UCD Pre-College Program/Solidworks/West Yost&Davis Senior High

Briefly describe the impact of the *FIRST* program on team participants with special emphasis on the 2017/2018 year and the preceding two to five years

-87% of alumni attend university --Of which 85% major in STEM -14 FRC teams mentored by 1678 alumni --2015 alumnus Jake Young helps mentor Australian teams -1678 students spent 3781 hrs mentoring youth robotics teams over 4 yrs: Develop leadership, communication, teaching skills, teamwork, problem solving -Team growth: --8 members in 2005 to 110 in 2018 --400 members since 2005

Describe the impact of the *FIRST* program on your community with special emphasis on the 2017/2018 year and the preceding two to five years

-Youth Robotics summer camps --147 campers attended over 2 yrs, 144 campers signed up for 2018 --Provided 81 student volunteers (2800+ volunteer hrs) over 2 yrs -Created 5 after-school robotics programs (55 elementary students enrolled) -Hosted STEM Workshops at Tech Trek camp for girls (4 yrs, 270 girls) -Students wrote & implemented a Winter Shelter app (finds available beds in 2 nearby homeless shelters) --10 police trained, 40+ beds found to date -- Plans to expand into rest of Yolo County

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

-1678 booth at local Farmers Market (6 yrs) --1400+ student hrs spent at booth -Career Skills Classes (2 yrs) --Hosted at Davis High School --Taught crimping, soldering, and basic code to students w/ disabilities -Robotics Classes for grades 5-12 (3 yrs) --505 students enrolled -Robot demos to community groups (Boy Scouts, Senior Center, etc.) --28 demos in past 5 years, over 3,000 community members reached

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

-Woodie Flowers Award Finalists: Steve Harvey (2015) & Mike Corsetto (2016) -Dean's List Finalists: Megan Y (2015) and Maya B (2017) -Won GP award on Newton in 2014 --Helped 2 rookie teams improve robot capabilities (5310 went from 2 matches won in their regional to 5 matches won on Newton) -Won GP award at SVR in 2015 --Since 2015 1678 has consistently helped teams in the pits at competitions, which later was formalized as Citrus Service in 2016

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

-Team 5458, Digital Minds (2014) --Sacramento Regional Winner, Rookie All-Star Award Winner (2015) --1678 helped fundraise for 5458 to travel to 2015 and 2017 Champs -Team 6174, Kaprekar's Constants (2016) --Offseason comp Capital City Classic (CCC) Winner (2016) --1678 hosted practice sessions for 6174 -Team 5808, Revive Robotics (2016) --Drove 1678 practice robot at CCC (2015) -Team 7229, Electronic Eagles (2018) --1678 helped recruit members for 7229, helping to build kit bot (2018)

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

-Started 23 FLL teams: --1st Team in Davis (2013) --7 New Teams (2014) --16 New Teams (2015) --26 Youth Robotics Teams by 2017 --At least one 1678 student mentor to help each team -Helped start 3 FLL Teams (Robot Spartans, EPA Gueraches, and EPA Avengers), total of 20 kids --Donated 3 FLL kits -Supported first FTC team in Davis --Students progressed from one of 23 FLL teams we started

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

-Formalized Citrus Service in 2016 --675+ student hrs providing support & resources to 47 teams at events -Founding member of Compass Alliance: Online hub to help FRC teams worldwide --100 website views/day --46 videos, 52 documents ----Resources translated to Spanish, Turkish, Hebrew, Mandarin -1678 forms Davis Youth Robotics teams (2018: 27 teams w/ 354 total students) --Host 3 competitions a year (2,000+ event student volunteer hrs) --Provided 60+ student mentors for local teams over 3 years

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)

-Volunteered and judged Jr. FLL competition w/ 3250 (2017) -Mentored rookie 6520 from Vietnam w/ 4590 from Israel (2016) -Co-host offseason event CCC (3 yrs) w/ 2073 and 3859 --37 FRC teams attended (2017) --1678 hosts Fall Workshops at CCC (3 yrs): 64+ total given, 500 attendees (2017) --Topics: Design, Fabrication, Electronics, Leadership etc. --Workshop videos posted online: Over 15,000 views total -1678 lead mentors present in Australia at 3132's Conference to support global FRC (2016-17)

Describe your Corporate/University Sponsors

-Schilling Robotics (since 2007) --Local robotics firm --Provided funds, mentors, site tours -UC Davis (since 2011) --Funds from Chancellor and 15 schools/colleges --Annual presentation/demo to all Deans of UCD -Davis Joint Unified School District (since 2014) --Provided coaching stipends, robot kits -NVIDIA (since 2016) --Invites 1678 to NVIDIA conferences --Sponsored 1678 trailer purchase (2015) -DMG MORI (Since 2012) --Sponsored all-expense paid trip to Japan for 19 students

Describe the strength of your partnership with your sponsors with special emphasis on the 2017/2018 year and the preceding two to five years

-1678 hosts open house for sponsors after each build season, creates videos to demonstrate sponsor impact and demos bot for major sponsors -Schilling --1678 participated in Schilling's Corporate Safety Training -UC Davis --1678 students volunteer at Sac (UCD) regional, mentors on regional planning committee -School District --Hosts DYR camps, profits reinvested in district robotics classes -NVIDIA --Partnered w/1678 on Jetson platform development -DMG MORI --1678 presented to company president

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

"For me, FIRST is an open door that 1678 has invited me to walk through, allowing me to mature as a communicator, innovator, and future engineer" -Maya Brandy, General Mechanical Lead, 2018 Students in a FIRST program: -Innovate with time constraints -Form technical skills to build robots on a large scale -Design, fabricate, and code with mentor platform -Are empowered to pursue a career in STEM -Compete in a cooperative atmosphere -Are encouraged to spread STEM & provide opportunities to all

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

-Hosted "Women in STEM" seminar for 3 yrs (150 total attendees) --Hosted female CEOs, professors, engineers and college deans as seminar speakers --Speakers provided role models to girls --Converting to "Diversity in STEM" to provide support for all minorities in STEM -Youth Robotics summer camp proceeds are donated to starting district robotics classes --1678 donated \$17,000 in 2017, has committed to \$20,000 in 2018 --2018 camps include an all girls week, lead by female 1678 students & mentors

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

James Zablotsky

Essay

Team 1678 Citrus Circuits follows FIRST's vision of "developing technology leaders and other innovators" by educating, engaging and inspiring our far-reaching STEM family. We transform our communities through education; we engage people of all ages through outreach; we inspire others with our commitment to excellence. Our three pillars make us a role model team in the FRC atmosphere.

The first of our team's three pillars, education, incorporates all of the learning and teaching we do on our team through our Peer-to-Peer (P2P) model. This model is a mentor-guided, student-driven system whereby new 1678 members learn the skills needed for the FRC season. By adopting this approach, we ensure the sustainability of our team and outreach projects and allow our two other pillars, outreach and commitment to excellence, to flourish year after year.

In order to establish a culture of STEM in our local community, we started by bringing robotics curriculum into the education system. We began and continue to fund seven robotics classes in five different secondary schools, impacting over 150 students in the past three years. Additionally, we have started five new robotics programs for over 75 elementary school students in the last two years. At each school, two 1678 students, trained from our P2P model, spend time guiding young minds to develop a passion for robotics.

Every 1678 student is educated through our P2P model, which enables each member to apply what they learn to their own personal future. Jake Young, a 2015 alumnus, was part of the 2017 Robots in the Outback road trip, using his machining and design experience to help teams in Australia. In addition, 2006 Team Captain and MIT graduate Ellie Hass mentors FRC Team 5419 Natural Disasters in Berkeley, California. The influential alumni who shaped our team culture have grown into leaders, communicators, and inspirations who pursued an education at top universities like MIT, Carnegie-Mellon, Johns Hopkins, and many more. Their innovations, from designing prototype hardware for stroke detection to developing self-driving trucks, arose from their humble beginnings as young 1678 students.

Our sponsors are integral to furthering the education of students on our team and give us resources to provide for the educational programs in our community. They allow us to pursue opportunities, stimulating our growth and community impact. We value this symbiotic relationship. For example, NVIDIA invites 1678 team members to participate in FIRST Day at NVIDIA GTC and technology workshops at their headquarters every spring, allowing our students to learn about new breakthroughs in the STEM world. In return for continued financial support over the past three years and the educational opportunities they provide, we supply feedback on NVIDIA's widely-used Jetson vision processing technology and proudly display their logo on our team's trailer. Another of our larger sponsors, University of California at Davis, has provided seven years of continued financial support, allowing us to expand and share expertise in local STEM programs, like the all-girls, UC Davis-hosted "Tech Trek", a summer camp designed to introduce young girls to STEM. Our partnership with UC Davis enables us to bring STEM education to all corners of our community.

Our second pillar, outreach, directly introduces STEM not only in schools but also into our general community. One program created for our youth, the Davis Youth Robotics (DYR) League, is an ever-growing organization, currently standing at 27 teams. During the 2017-18 League season, 1678 student mentors spent over 600 hours facilitating robot building and programming, which helped 354 League members gain critical thinking, teamwork, and project management skills.

In addition to DYR League, we created DYR Summer Camps to extend the learning opportunities provided by DYR through the summer. Campers design, build, program, iterate, and compete with their robots, a process incorporating problem-solving and ingenuity into the engaging environment our student mentors provide. From its inception in 2016, we saw tremendous growth: an increase of two to four weeks, 54 to 93 campers, and 600 to over 2,000 volunteer hours in just two years.

Our engagement with our high school reaches beyond our facilities. As a joint effort with our school's Special Education Department, we started and ran weekly Career STEM Skills Workshops for special education students over three semesters. We taught our peers to solder, crimp, use industry machines, and write basic code. We showed them new career possibilities and introduced them to new future choices, and they showed us the importance of engaging with this part of the community.

Another aspect of our community engagement is using technology to help those in need, demonstrated through the development of our Winter Shelter App. This electronic application tracks empty beds, in collaboration with police officers and local homeless shelters. In the past three months, over 40 beds in two homeless shelters have been found and ten Davis Police Department officers have been trained by our team members to use the app.

Essay - page 2

Our third pillar, commitment to excellence, drives us to ensure that every team we meet has a rewarding FRC experience at competition. For example, we host Fall Workshops at the annual offseason competition Capital City Classic (CCC) that we co-host with FRC Teams 3859 and 2073. These workshops, presented by 1678 students and mentors along with other local FRC teams, offer a variety of topics every year including Scouting System Development, Mechanical Design, and Managing a Budget, and many more. All workshops are posted online to reach the global FRC community, collecting over 15,000 views so far.

We know we can inspire more when working in conjunction with other teams. Our team has been a staple at the Mentors Without Borders conference, run by FRC Team 3132, since its start. Our lead mentors Steve Harvey (2016) and Michael Corsetto (2017) have traveled to Australia to present at this internationally-scoped conference, giving workshops to teams across rural Australia and far beyond. There, they taught methods developed by 1678 which lead to success in both Mechanical Design and Team Management.

We believe that every team should be inspired by rewarding success at competition. What began in 2014 as a desire to aid teams during the stress of competition led us to formalize Citrus Service in 2017. This service sends five 1678 students at a time to collaborate with other teams to install parts, troubleshoot issues, and perform mechanism evaluations in the pits. In 2017 alone, Citrus Service spent over 675 hours lending technical knowledge to 47 teams. As 649 alumnus Samay remarked, "I think it's great that such a well known and dominating team in FRC is really willing to help other teams, and that they're willing to bring other teams up, they're not just in it for the competition."

1678 students and mentors, many of whom are in Citrus Service, devote their time and resources toward not just starting, but mentoring, new FRC teams. We ensure the three local teams we've started (5458 Digital Minds, 6174 Kaprekar's Constants, and 7229 Electronic Eagles) have the necessary support to achieve all they can. We help them analyze the new game, work out build season design strategies, teach them to fabricate bumpers, and supply prototyping advice, tools, and materials. For example, our fabrication mentor Devin Castellucci is also 5458's lead mentor and spends as much time as possible helping make parts for his and other local teams. Our mentorship continues year-round and fosters a mutually supportive partnership, enriching the FIRST experience for everyone involved. With our help, 5458 won the Sacramento Regional and Rookie All-Star Award in 2015.

We are proud to be a founding member of The Compass Alliance (TCA). This program began with ten powerhouse teams using their experiences to create a "One-Stop Shop" for teams seeking assistance. Under this umbrella falls a repository of written and videotaped resources, virtual mentor-matching, and an international chat center for around-the-clock help. Documents and website information are translated into both Spanish and Turkish. As this organization continues to grow, we plan to add Hebrew, Mandarin, and more. With around 40 more alliance partners contributing and translating resources and 100 website views every day, TCA will continue to flourish and enrich the FRC experience for everyone.

Through these programs, our team strives to be a role model in our local and international communities and exemplify our mission to spread the values of FIRST. Our belief that STEM opportunities have the potential to enrich everyone's life drives our outreach and educational endeavors. Jared Russell, a mentor on Team 254, described our team and purpose:

"Yes, you have blue banners and trophies... but anyone who has ever been on an alliance with 1678, or any of the countless teams whose robots have been improved by Citrus Circuits, or anyone who has watched you receive GP award after GP award, or anyone who has ever talked to your students, knows that your rise to dominance has dragged behind it a wake of inspiration and improvement in everything and everyone you touched along the way."

Our growing presence in the world of STEM has empowered us to inspire others. We will continue to do so with support from our three pillars: we transform our team members and communities through education, we engage the world with the opportunities we provide through outreach, and we thoroughly commit ourselves to inspiring others through FRC. Team 1678 brings the excitement of education, outreach, and excellence in competition to our global STEM community.