

Chairman's Award - Team 701

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2019 - Team 701

Team Number

701

Team Name, Corporate/University Sponsors

Travis USD/Genentech/United Technologies Aerospace Systems/Solano County Office of Education/Salik Syed/Intuitive Surgical/Vintage Paving Co./Delta Grinding Co Inc./Vaca Valley Bingo Hall/Pirondini Family/Michael and Margaret Salvador/Meta Design Manufacturing/Dale Salvador and United Way/Paula Green/Brin Wojcicki Foundation/Vulcan Materials/Travis AFB Spouses Club/J & B Transportation/Vanden Robotics Foundation&Vanden High

Briefly describe the impact of the *FIRST* program on team participants with special emphasis on the 2018/2019 year and the preceding two to five years

100% of graduated RoboVikes go on to college or enroll in the military. 84% major in a science field. 90% who join the team stay for the remainder of their high school years. Even after graduating, alumni remain motivated to come back and participate in the program by volunteering at events or mentoring other programs. Our students build consistent communication skills that help them earn scholarships and awards. Our experiences on Team 701 continue to influence us throughout all lives.

Describe the impact of the *FIRST* program on your community with special emphasis on the 2018/2019 year and the preceding two to five years

Over several years we have started and maintained contact with robotics programs in our community. Students mentor elementary school VEX IQ teams on a weekly basis as well as host scrimmages every couple of weeks to help prepare them for the qualifying matches held in January. Over the past couple of summers we taught the children of migrant farm workers the principles of STEM. Before build season we hosted a spaghetti feed, in order to bring more attention to the STEM field in our community.

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

In Nov. 2014 and 2017, we had the opportunity to go to China, where we started new robotics programs. In 2014 we started a team in Shanghai, and last year, we hosted "Robotics in Engineering" workshops and used student to student teaching to explain FIRST at Beijing Economic Management School and Jiaxing Nanyang Polytechnic Institute. With these programs initiated, we brought FIRST principles across the world. Some of their students are also coming to Vanden to experience our FRC season.

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

We teach our members the importance of STEM, leadership, and communication. For example, during FIRST competitions we always lend a hand to teams who need materials or assistance, reflecting our value of gracious professionalism. We also shared with the students of Meilong Middle School, the #1 public school in the world, the dynamics of student-to-student teaching, a previously unused method. Through these actions, we hope to instill the ideas that FIRST has taught us onto everyone we meet.

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

Since 2004 our team started expanding STEM ideals by teaching other schools FIRST's core values. We first helped start a team in Davis High, Team 1678. Soon after we did, the word of FIRST spread farther, more schools became interested in robotics, and our team was able to help start teams at Buckingham Charter (5496), Armijo (6474), Vacaville (2085), Hiram Johnson (2156), and Vallejo (3013) High Schools. Most recently, we started Team 6918 from Napa High, who are competing this year as rookies.

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

We were able to introduce FLL to local elementary schools, but we found that the transition towards VEX IQ Robotics allowed us to expand further in our community. We used to host an annual FLL tournament in conjunction with Team 2085, the RoboDogs, until they were able to host it on their own. Now we are helping team 5496 the RoboKnights host FLL tournaments at their high school, and we continue to become an integral part in FLL teams by mentoring FLL students at 21st Century Learning.

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

In 2009 an alumni was inspired by his experience to start up 3257 Vortechs and later we helped their team assemble a competitive robot. We have also assisted 1662 Raptor Force Engineering, 3669 Ripon High, 5852 Merced High, and 6711 Atwater High by answering their questions about the fundamentals of building a robot and outreach, along with lending them basic parts they would need to compete. We hope to share our team values throughout the FIRST community and beyond to other organizations.

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)

The most recent teams we mentor are 6474 Armijo HS Robotics and 6918 Napa HS Robotics. We visited 6474 to give them a clinic on the basics of programming, electrical, and mechanical. We also invited 6474 and 6918 to our workplace during kickoff and build season to show them how we manage our team and organize our committees. We especially help them with programming debugging, addressing design issues, and machining parts. We also host award workshops to better prepare them for the awards season.

Describe your Corporate/University Sponsors

Over the years many businesses have been a key part in keeping our team running. We integrate ourselves with our sponsors: Classic Powder Coating, United Technologies, Genentech, The Solano County Office of Education, Intuitive Surgical Design, Tony Pirondini, Teichert, Republic Services, Delta Grinding Co, United Way, Travis Unified School District, Salvador Family, Paula Green, Salik Syed, Talent Sonar, Tencate, Vintage Paving, Vaca Valley Bingo Hall, and META Design and Manufacturing.

Describe the strength of your partnership with your sponsors with special emphasis on the 2018/2019 year and the preceding two to five years

To maintain relations with our sponsors, we demonstrate our robots at some of their events, such as Genentech's "Bring Your Kid to Work Day". After build season, we invite sponsors to our school, give them a tour of our facilities and demonstrate the robots they helped create. We also invite them to our annual spaghetti feed. To show our appreciation to our sponsors, Vanden students created awards for our sponsors as a group project for the class, using 3D modeling and Arduino programming.

Describe how your team would explain what *FIRST* is to someone who has never heard of it**Briefly describe other matters of interest to the *FIRST* judges, if any****Team Captain/Student Representative that has double-checked this submission.**

Devina Velasquez

Essay

Team 701: The RoboVikes

In 5 years, we have hosted 21 competitions, which contributed to a fraction of the 9,500 total hours of outreach achieved by our students. In 5 years, we have created robotics programs in 14 schools across the US and in China. In 5 years, we have constructed a community thriving around the fundamentals of FIRST, bridging the gap between classroom learning and real world application.

Establishing Ourselves at Home

On our team, 60 students belong to 1 of 5 engineering committees: Design, Mechanical, Electrical, App Programming, or Robot Programming. This allows students to specialize in 1 area of robotics. They can also become a committee leader, and learn time management and teaching skills.

Similarly, our Business and Awards Committees allow students to learn the logistics of our team. Working in these committees helps students gain knowledge of gracious professionalism, oratory skills, and business processes.

We are led by a team of 7 elected students: Director of Operations, Director of Engineering, Outreach Manager, Business Manager, Media Manager, Awards Manager and Secretary. These students ensure that team activities run smoothly, from community interactions to robot decisions. Students in these positions learn how to lead, teach, and present, skills that can be applied into their professional careers.

Sharing Robotics with our School

Our work starts at school. We coordinate with our school's student body to participate in school activities. For instance, on Dream Job Day, we demonstrate our robot and speak about different opportunities and careers students can pursue in STEM. We also promote our robotics program by selling viking horns and presenting our robot at school football games. In the spring, we are involved in the school's Exhibition Day. There we showcase our robots, the machines in our shop, and student projects from the different STEM classes to help draw attention to the opportunities in STEM currently available to students.

The start of Team 701 greatly increased the interest in engineering and manufacturing in our school. From an after-school robotics club, we have expanded into 4 A-G UC approved elective courses: Intro to Engineering, Engineering Tech I, II, and III. This year students will also be receiving college credits for enrolling in Tech II & III and passing the final with a B or higher. Furthermore, interest in programming has allowed for the inclusion and growth of AP Computer Science A and AP Computer Science Principles. These classes, which now have over 170 students annually, became a way for people to learn about FIRST Robotics and STEM careers. For the past few years, we worked with our school district to strengthen our engineering pathway by securing grants to purchase instructional materials and equipment such as laptops, software, robotics kits, CNC Machines, plasma cutters, laser cutters, and 3D printers. In turn, students gain hands-on experience using modern tools of engineering and manufacturing, which can be applied in industry and on the team.

Robotics with Local Schools

We spread STEM to local schools by introducing them to robotics. Our students mentor 32 robotics students at the middle school and 80 robotics students at the 5 elementary schools in our district.

To create a stronger STEM community for local teams, we have run and hosted robotics competitions for the past 15 years. In the last 5 years, we hosted 3 FLL tournaments and started 6 FLL Teams. In 5 years, we ran 4 FLL tournaments and assisted Team 5496 in running 1. Moreover, we host and run our own VEX Robotics Competition, with more than 50 high school teams competing annually, as well as the Golden West VEX Robotics Competition for 30 middle school teams. For the 27 teams of elementary schoolers, we host monthly robotics scrimmages and a final robotics competition. These account for more than 1,300 logged outreach hours. Through mentoring and running these competitions, we are able to incorporate robotics into all levels of education in our district, and sustain students' interest in robotics and STEM. The results are apparent in our own team: 90% of current RoboVikes discovered their passion for STEM through RoboVike mentored programs such as FLL and VEX EDR. Rookies coming from these programs have contributed to a large increase in our total number of team members over the last 3 years, with an addition of 20 students-an almost 60% increase.

In spreading STEM to our community, we also aim to increase the involvement of girls in robotics programs. By catching their interest early, we are able to dispel the stereotype that only boys belong in STEM. For example, as a result of establishing youth programs, many girls on our team developed an interest in engineering and fabrication which was sustained into our high school program. This is most apparent in our largest committee, Mechanical. 4 years ago there were no girls in this committee, but they now make up over 40% of it.

Summer Camps

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We use summer camps to connect with the community. For 3 years, we mentored Camp Athena, a summer program which encourages young girls to take interest in STEM. Over the course of the program we have mentored over 135 students, teaching them basic programming on Linkbots. Many of these students, having developed an interest in coding, join the robotics team that we started at their elementary school. Our students have also worked with the Fairfield-Suisun School District, SCOE, and BCOE for the past 4 years to host a Migrant Education Program. This better the education of more than 30 children from migrant families annually through exposure to the Principles of Engineering, English, and Math using FLL Robots. We ensure that these students come out of the program having enhanced their educational foundation, enabling them to excel in their school careers.

This year we have participated in several new summer camps across our city including a C-STEM camp for girls, an FLL camp, and a VEX camp. We worked with Solano Community college to mentor young girls in a programming course and we teamed up with a local tutoring center to teach elementary children how to build and program a FLL robot. Students also mentored incoming middle schoolers, introducing them to more sophisticated robots before they joined their school's team.

Beyond Our Community

We strive to share robotics with those across the world. In November 2014, we visited Meilong Middle School in China and showed them how to start a robotics program, even supplying a school curriculum. A few years later, they went on to become VEX Robotics World Champions. In November 2017, we visited Beijing Economic Management School (BEMS) and Jiaying Nanyang Polytechnic Institute (JNPI). At JNPI, we demonstrated our robot, and introduced student to student teaching. At BEMS, we held workshops to build, design, wire, and program a FRC robot. In order to excite and prepare them in the creation of their own FRC team in an upcoming season.

Helping Other FIRST Teams

Since 2004, our team has been working to spread FIRST to high schools in California. So far, we have started 9 FRC teams, 3 of which were started in the last 5 years. This includes 5496 Buckingham RoboKnights in 2015, 6474 Indigo Dynamics in 2017, and 6918 Napa High School Robotics in 2018. We were glad to invite and host 3013, the Zombots, to our shop just before kickoff, and 6474 to our site for kickoff so that they were better prepared for the upcoming 2019 build season. We assist all 3 teams throughout the season, especially in addressing design improvements, programming debugging, and machining parts.

At competitions, we assist teams by providing them access to materials and tools, or if they wish, helping them address design or mechanical issues. In addition to helping these teams with robot problems, we also hold awards and business workshops to teach them how to fundraise, acquire sponsors, and present themselves and their team professionally.

After the FRC season, we offer a scholarship to any robotics student in Solano County, awarding 3 students \$1000 each. We also teamed up with the Gene Haas foundation, offering students and teams \$1000+ in scholarships.

Bringing Robotics Back to Our Supporters

We are thankful for our sponsors and our proud to give back to them. At Genentech's "Bring Your Kid to Work Day", we demonstrate our robot to build interest in robotics among youth in our community. We participated in Intuitive Surgical's RoboNanza where we competed with other teams. We also visited META Design's shop to demo our robot and thank them for supporting our team. We give our sponsors plaques, made by our students using laser cutters and arduinos, as a token of appreciation. Several of our sponsors join us during the build season and help mentor students on the various elements of FIRST.

RoboVike Graduates

At the end of their high school journey, RoboVikes take what they have learned from Team 701 to their own unique career pathways. In total, 178 RoboVikes have graduated and gone to work with major companies across the nation. 97% of RoboVikes go on to college, 86% of which pursue STEM majors, and 3% enlist in the military. Some have continued on to well-known companies such as Tesla, Lockheed Martin, United Technologies, and the FBI. Several alumni, in the RoboVike spirit of giving back to others, share what they have learned by volunteering at FIRST Events as FLL judges, FLL referees, FRC Regional Committee positions, FRC referees, and FRC judges. Many alumni also mentor us, others mentor teams closer to their colleges, from California to Michigan.

Continuing On

Together, we continue to share the gift of FIRST, STEM, and robotics to our school, local community, and even across the world. In the next 5 years, it is our goal to build an educational standard for robotics in high schools throughout the county using the UC approved A-G engineering courses we have created.