Chairman's Award - Team 4096

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2018 - Team 4096

Team Number

4096

Team Name, Corporate/University Sponsors

Caterpillar/University of Illinois 4-H Extension/CS+X Learning Labs/Monsanto Fund/Yahoo!/Illini Robotics&Champaign County Community Team&Champaign County Community Team

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

Ctrl-Z is a community team, drawing members from thirteen different schools and a wide range of home environments. FIRST has solidified the career choice of every member that has entered the team. 100% of Ctrl-Z alumni have gone to college as STEM majors. FIRST has also inspired team members to give back: all students participate in outreach events and teaching opportunities, and two students in the past three years have been honored as Dean's List finalists.

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

FIRST has inspired Ctrl-Z members to take initiative and create STEM education opportunities within the Champaign-Urbana community. Ctrl-Z created a summer camp that teaches 35 students for eight hours each weekday for two weeks, focused on introducing underrepresented minorities into STEM. Ctrl-Z also started Girls Who Code clubs to specifically empower girls in STEM. These activities, and much more, have generated tremendous youth interest in STEM education.

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

Seven years ago, prior to Ctrl-Z's founding, there was no FRC or FTC presence in Champaign- Urbana and robotics opportunities for kids were few and very expensive. Ctrl-Z runs a summer camp that costs 75% less than the comparable university program. To minimize costs, Ctrl-Z utilizes completely volunteer-based instruction. Our value-oriented mission garners widespread support, allowing us to gain many teaching resources, from surplus FLL kits to expert researchers, without any extra cost.

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

Ctrl-Z students leave no stone unturned. Students run Girls Who Code clubs, mentor FLL, FTC and FRC teams, work at the Summer Youth Robotics Academy as volunteer staff and fill crucial roles at three FLL tournaments to give back to the future of FIRST. Seeing our presence in our community, local investors, politicians and organizations are coming together to support and share our mission. We inspire both other FIRST members as well as other STEM leaders in our community.

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

Over the years, Ctrl-Z has built in-house software systems to manage meeting notes, shop inventory, and daily attendance. These tools have created an efficient workflow during both build-season and off-season. Ctrl-Z has started FIRSTStudio, an initiative in which these tools will become accessible to any FIRST team. The software suite is projected to be released within the next two years. This suite will managing a team easier, ultimately leveling the playing field across economic situations.

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

Ctrl-Z has started so many FLL teams that local elementary schools incorporate FLL into their science curriculum. Ctrl-Z hosts open houses to keep our community informed about what we do, meet with those interested in starting FIRST teams, connect FIRST teams and show interested media and educators what FIRST is. Last year, Ctrl-Z started "Ctrl-Y," a feeder FTC team. Ctrl-Z supports Ctrl-Y with shared shop space, tools and technical expertise. All members of Ctrl-Y are encouraged to join Ctrl-Z.

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

Ctrl-Z has created a FIRST "pipeline" in the Champaign-Urbana community. All FIRST programs are now available, from FLL Jr. to FRC. At least one team in each program receives substantial support from Ctrl-Z, including coaching, technical resources, shop space and help with funding. We also mentor ten FLL teams and three FTC teams and invite these FTC teams to all outreach events.

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)

FLL and FTC teams around the county know that Ctrl-Z is a source for assistance. Ctrl-Z also works with Team 4213 to conduct demos and assist teams in between our districts. We work with local FTC teams to plan local outreach events and show the many levels of FIRST opportunities. Ctrl-Z helped a team with only four members learn to code via skype sessions and travelled to Chicago to help them fix their robot and compete.

Describe your Corporate/University Sponsors

Ctrl-Z is currently sponsored by Caterpillar, Monsanto Fund, Yahoo!, CS+X Learning Labs, University of Illinois 4-H Extension, SolidWorks, Illini Robotics, and Wingware. The team's sponsors support Ctrl-Z by providing funding for fundamental aspects from robot parts, to scholarships for the low-income students that attend our summer camps, to use shop space and software licenses. Each sponsor is given a different status based on contributions.

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

Ctrl-Z has a particularly deep connection with sponsors who provide more than monetary support. Mentors and coaches have come from Wolfram, Volition and Intel. Yahoo, Volition and Wolfram have hosted field trips for Girls Who Code. Ctrl-Z has a deep connection with CS+X, as we share the same mission to make robotics education widely accessible. We often assist each other on projects we are working on. Ctrl-Z sends sponsors quarterly newsletters and open house invitations to keep them updated.

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

FIRST is the ingredient that turns teammates into friends and friends into family. FIRST turns students into designers, builders, writers and speakers. FIRST is the bonding agent between STEM education and diverse aspects of large communities. FIRST shows students how to dream big and helps them to achieve those dreams. FIRST inspires students to never stop at changing their own lives and to continue changing the lives of every generation after.

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

In 2015, Ctrl-Z ran a camp in Clarksdale, Mississippi, one of the poorest towns in the US, inspiring an observer to start one in New York, amplifying the message of FIRST. Ctrl-Z students were asked to speak on a national radio show about the team. The future of Ctrl-Z's national impact is bright, as the team has committed to two years of attending the National Advocacy Conference with FIRST in Washington DC to discuss the importance of STEM education with US representatives.

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

Jayasurya Sridharan

Essay

Like every FRC team, Ctrl-Z Team 4096 loves robots, but we pride ourselves in being "more than just robots" in every possible way. Ctrl-Z is a lifestyle. Ctrl-Z is a community, a support group, a sprawling network, and a comforting safe harbor. We understand that in this era of rapidly advancing technology, diversity and inclusion are critical to success. Thus, over the years, we have stepped out into our community with a mission to break down the barriers in STEM education and pave the road for aspiring engineers. We work to unite STEM organizations in Central Illinois under a common vision of widespread engineering inspiration.

"Joining Ctrl-Z was so empowering because we actively work to be inclusive. I really believe in my future in STEM." said Anna Ondrejkova, a team member who grew up in the Ctrl-Z community. At our core, our team believes everyone, regardless of background, should be able to participate in engineering. As such, we focus on striking down gender, racial, and socioeconomic barriers that discourage students from STEM. Throughout the year, we run many demonstrations showcasing our competition-tested robots. From demonstrating our robot at GAMES (Girls Adventures in Math, Engineering and Science) Camp, to starting a Girls Who Code club, we engage over a thousand girls every year. Until then, many of them never thought engineering was a possibility for them. As these girls join our team, we waste no time hooking them in for life. Each off-season, our team is active in fun, female-focused festivities, such as preparing the girls on our team for the IndyRAGE Competition, to which we send an all-female drive team and pit crew. As they manage all facets of the competition, female veterans teach their rookie counterparts, building a camaraderie among the girls and supporting our team's message that they are welcome in STEM. Activities like this set the stage for our season. In fact, six of our ten build captains this season are female. Over the past three years, forty-seven girls have joined Ctrl-Z.

In addition to supporting girls in STEM, Ctrl-Z's safe harbor extends to underrepresented minorities and students of lower socioeconomic status. One of our biggest achievements is the creation of the Summer Youth Robotics Academy (SYRA). In August 2015, after volunteering and being on the board of six engineering summer camps, Ctrl-Z resolved to create a summer camp specifically for robotics. In one year, our team spent 2,000 total student hours advertising to thirteen schools, applying for grants, recruiting volunteers, and creating a robotics curriculum to engage children with FIRST. For two weeks in the summer of 2016, seventy children attended the camp and had the time of their lives, many having never previously attended an engineering camp. Using an FLL- and FTC-based curriculum for elementary and middle school children, along with a series of demonstrations from the University of Illinois faculty, our camp serves as a "trial run" for FIRST programs in our community. In SYRA's first year, twenty percent of our camp students went on to join a FIRST team, and nearly half returned to our camp the second year. While our local community offers STEM-oriented summer camps, the hallmark of SYRA is its emphasis on recruiting members of underserved minorities and students of lower income levels, and even kids with learning disabilities. Last year, twenty percent of SYRA students were on scholarship, with a total of three thousand dollars awarded. The Ctrl-Z mission of encouraging underserved communities in STEM doesn't stop with SYRA. The team has also been working with the local bilingual academy, teaching Girl Scout troops to code with "Hour of Code", coaching a Spanish-speaking FLL team, and helping find funds and resources for an FTC team with primarily African American students. Ctrl-Z is dedicated to bridging the gap in STEM in these underserved communities, and over the past few years we have made a tremendous amount of headway.

"Kids really made that?! Can I make one too?!" a three foot observer exclaims. No matter their age, when children inquire if FIRST is for them, Ctrl-Z's answer is always yes. With the rising interest in STEM programs in Champaign-Urbana, especially within the Ctrl-Z target groups, we recognize that we must not allow the growth in interest to outpace the growth in opportunity. Thus, Ctrl-Z has formed a "pipeline" of FIRST teams that we actively manage and grow. In Champaign-Urbana, children can start their robotics adventure early. In exchange for assistance from Ctrl-Z with their robotics-education endeavors, the local Orpheum Children's Science Museum houses two local FLL Jr. teams next door to the Ctrl-Z shop, serving as the first segment of our pipeline. These teams started in 2017 under the guidance of Ctrl-Z and have since matured into self-sufficient programs. FLL Jr. students graduate into the next segment of this pipeline, a network of local FLL teams. Ctrl-Z started FLL Team "Lunar Penguins" in the Ctrl-Z shop in 2015, supporting all facets of the team, from funding to coaching. To support this team and all other local FLL teams, Ctrl-Z works with Illini Robotics to manage the FLL Qualifier and State Tournament as well as the 4-H Regional Tournament. Last year, Ctrl-Z spent over 850 student hours helping plan, implement and execute these events, making it possible for over 400 children to see their FLL creations in action. At these events, Ctrl-Z also demonstrates their own robots, and invites other FIRST teams to hold their own exhibitions which excite young minds about their future in FIRST. After exploring robotics through FLL, kids have the opportunity to move into the third piece of the pipeline, Ctrl-Z's feeder FTC team "Ctrl-Y", which was born during the summer of 2017. In three months, Ctrl-Z students and mentors worked to find funding, recruit mentors, and advertise to middle school students. Their inaugural season began in the fall of 2017 by helping twelve middle school kids segue from LEGO robotics to working with real metal parts and designing anything they thought possible. Ctrl-Y operates in the Ctrl-Z shop, with material resources shared between the two teams. Additionally, Ctrl-Z and Ctrl-Y have many shared shop hours per week, allowing Ctrl-Y students to easily seek assistance from more experienced Ctrl-Z students and mentors. Ctrl-Z also started a FTC team in Paxton, a nearby small rural town. In a high school with almost no STEM extracurriculars, Ctrl-Z students helped find funding, led trainings, provided tools, and ultimately changed the culture surrounding robotics in the town. As a final step in the STEM pipeline, these FTC students are encouraged to join Ctrl-Z. At that point they can look back on the impact robotics has made on their lives, embrace the Ctrl-Z mission as their own, and work to give back to the community that served as their guiding light.

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"What you're doing is remarkable," said Congressman Rodney Davis in a meeting about strategies to combat the alarming racial disparities in STEM fields and higher education with Ctrl-Z students. While Ctrl-Z spends countless hours working to generate STEM opportunities in our community, we recognize that we can't do it alone. Just as FIRST inspires us to make STEM education an integral part of our mission, we inspire other Central Illinois organizations to share our vision as well. By meeting with important community figures and discussing ways their organizations can promote the mission of FIRST, we are uniting powerful Champaign-Urbana institutions under a common goal of widespread engineering inspiration. Because our children's world revolves around their schools, Ctrl-Z feels the best way to incorporate robotics education into school curriculums is by exciting district administrators about the benefits of robotics education in primary schools. Ctrl-Z students have had over ten meetings to discuss racism in the classroom and the resulting achievement gap with the Assistant Superintendent of a local school district with nearly 10,000 students. Following this discussion, we worked out strategies to bring young members of underrepresented groups into the FIRST community, which we are working towards by being a founding member of CS+X, a local science center with the goal to make robotics education universally accessible. Our team is provided shop space in exchange for help with CS+X projects, including demonstrations, curriculum advice, help with coding and even grant writing. As a part of CS+X, Ctrl-Z students and parents have teamed up with professors at the University of Illinois, potential investors, members of the Champaign-Urbana research and professional community, and educators. Together we're developing a robotics education curriculum to be integrated in all local public elementary and middle schools, following students from the first grade to the eighth grade. As a whole, local organizations are looking to Ctrl-Z for advice on how they, too, can engage our youth in science and engineering.

Seven years ago, Champaign-Urbana was a very different place. Opportunities for youth education in robotics were few and far between. Since Ctrl-Z's inception, the opportunities have grown tremendously. By providing a strong peer group for girls and minority students from a wide range of home environments, Ctrl-Z has become a sanctuary for aspiring student engineers. Ctrl-Z has inspired students to devour knowledge about engineering, cherish diversity, and prioritize providing access to STEM education to those who otherwise lack the opportunity. As an organization, we inspire both our team members and community figures to help make robotics education easily accessible. With diversity and knowledge at the top of the team's core values, innovative Ctrl-Z students and alumni will continue to have impact for years to come.