

Chairman's Award - Team 4499

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2019 - Team 4499

Team Number

4499

Team Name, Corporate/University Sponsors

Lockeed Martin/Neaera Consulting/Front Range Powder Coating/Metal Distributors&Neaera Robotics

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

The Highlanders(4499) create problem solvers with real world experience. Knowledge gained from FIRST is versatile in school, internships, college, and job opportunities, preparing alumni to make differences in their communities. Our alumni best demonstrate FIRST's impact on 4499. 96% attend college after graduation, with 4% joining the Army. All college bound alumni pursue STEM majors: 64% return to assist 4499, 43% registered mentors, 38% FIRST volunteers and 10% are pursuing graduate programs.

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

From running 2 FLL Qualifiers to Title One School outreach, 4499 demoed at 66 schools and events including 3 parades, 16 expos—totaling approx 60,000 people, with many from underprivileged populations. We support flood victims, toy drives, and donate to a foster family organization. Colorado is our expanded community, this year alone, we assisted 11 FLL Qualifiers and the Colorado State Championships and inaugurated FLL judge training conference calls on behalf of ColoradoFIRST.

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

Alongside general community outreach though dressing up robots for Halloween, publishing children's books, creating FIRST themed activity books, and volunteering at local events, 4499 puts emphasis on youth. We spread FIRST's message by supplying volunteers, streamlining FLL events, and volunteering ourselves. By working with the Jeffco school board (2nd largest school district in Colorado), we ran the first FLL qualifier in Jeffco since 2013.

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

4499 embrace Core Values, sharing them with our assisted/mentored FIRST teams and at public events. At competitions, 4499 pass out survival kits to rookie teams, lend out tools, and assist teams in need. In the off-season, we participated and hosted a mentor support group, host lessons in CAM and carbon fiber design. We volunteer and assist with state-wide FLL event planning, serve as FIRST ambassadors, and our alumni continue to be active in FIRST long after graduating from the team.

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

4499 offers resources, supplies and training many FRC teams at tournaments and any team who reaches out. We assisted in writing rookie grants for FRC teams 5318 and 5657 and encourage local FRC teams to visit our shop to work on CNC equipment, learn carbon fiber manufacturing, and produce their own parts (159,4388). We are always here to help and guide students and mentors who are interested in the program to start FRC teams.

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

4499 started 10 teams, 1 FLL Jr., 8 FLL and 1 FTC, across the Colorado Front Range. Many participants that attend our summer camps go on to join *FIRST* teams afterwards. We hosted an FLL coach's training night, with those coaches going on to form 3 FLL teams of their own. We have assisted the Liberty Common FLL Jr. Tournament for 3 years. Through Neaera Robotics, our 501(c)3 non-profit, we assisted 10 teams and continue to spread the word of *FIRST*.

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

We facilitate progression through *FIRST* at FLL and FLL Jr. events and with our mentored teams. As Judges and Referees, 4499 are *FIRST* ambassadors. We demo our robot at *FIRST* events and give a presentation before the awards ceremony. Over 60% of team members progressed through *FIRST* (some from our mentored teams and camps). Local *FIRST* teams benefit from using our machines and unique capabilities (carbon fiber/3D printing).

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)

4499 members and alumni mentored 1 FLL Jr. team & 12 FLL teams, working for 6 years with 2 local Boys & Girls clubs after school programs. At past FLL qualifiers, 3 of our team members have been given the Youth Mentor of the Year award. We have assisted 4 FLL, 4 FTC and 13 FRC teams, plus countless others at tournaments—helping with coding, building, bumpers, tools and supplies. We helped FRC team members from 159 and 4388 learn to use CAM software at our "Learn how to run a CNC mill" workshop.

Describe your Corporate/University Sponsors

Our corporate sponsors Neaera Consulting, Lockheed Martin, Constant Contact, Keysight and Metal Distributors have assisted us financially. Other corporations that have helped 4499 through mentorship or supply donations include Front Range Powder Coating (FRPC), Xylinx, Fleetwood and AMD. Prior sponsors include: NASA, PTC, OtterCares, PEAK Resources and Micron. As a community-based team, we rely on meaningful partnerships with our sponsors; with their support, we excel.

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

Our sponsors partner with us. 4499 visit their facilities, give presentations, demos, and newsletters. Our primary sponsor, Neaera Consulting, hires team members and alumni as interns. They donate a portion of their profit from the work done by interns to 4499, totaling to over \$100,000 in financial support over the past 6 years. FRPC has generously powder coated our robot for the past 5 years and they love to see the competition robot with the parts they have powder coated.

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

We get to build and play robots! *FIRST* stands for "For Inspiration and Recognition of Science and Technology". It creates opportunities to work with local business leaders in the community, and improve skills in engineering, leadership, and teamwork. We compete with teams from all over the world in an environment where we promote each other's success. It provides real world experience and is the only High School sport where everyone can go pro.

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

The Highlanders are a team of students across Colorado from 7 schools 75 miles apart. 4499 has doubled in size in the last year. Modeling the Core Value of inclusion, with 45% minority students, we are a diverse team. Our team is young, median age 15, and we are leaders in our communities. We are tightknit, meet year-round and keep in touch with dedicated alumni. Our family is ever growing, dedicated to *FIRST* and dedicated to each other, which makes the Highlanders exceptional.

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

Jocelyn Holman

Essay

We are team 4499, The Highlanders: a group of 11 innovative engineers, future professionals, STEM ambassadors and driven leaders. Our ideas are persistent, our passions are incomparable, and our dedication is unique. The Highlander's journey is best summed up in four words: our mission, our community, our triumphs and our future. We are small, but we are mighty!

Our Mission

Our mission is to provide youth the opportunity to explore science, technology, engineering, and mathematics—through hands-on experience and support in STEM. To accomplish our mission, we created a 501(c)3 non-profit company, Neaera Robotics. What began as a FIRST think tank in Northern Colorado has expanded to fund 10 FIRST teams in the past 7 years across the Front Range. Neaera Robotics brings today's opportunities to tomorrow's engineers.

Schools often lack a hands-on approach to education. The Highlanders remedy that. We take our academic knowledge in math, physics, engineering and entrepreneurship, and apply them in real life. We spread STEM awareness through support and mentorship of FIRST programs, community engagement and new business partnerships. Through our endeavors, we discover numerous ways to fail, but our successful solutions stick with us. We find this type of learning helps us in many aspects of our education, not just engineering.

We meet and partner with local businesses to make our aspirations a reality. 4499 has a culmination of stories, successes, failures and triumphs that define us. We believe FIRST is the doorway to a greater community - the professional world. Our partnership with one of our main sponsors, Neaera Consulting, is our best example of synergy. Team members have gone on to intern with them doing software development, working on one of the first USDOT Connected Vehicle Pilot projects and mobile application development. In the past 7 years, these interns have raised over \$100,000 in direct donations to our non-profit, all from the work done at Neaera Consulting. FIRST skills are valuable in all industries. Other alumni have or currently work with other companies such as Woodward Governor, Tesla, Xilinx and more to pursue professional employment.

Our Community

4499 volunteers with unique and diverse communities along the Colorado Front Range. From our mentored FLL team at the Boys and Girls club in Loveland to an FLL club at a Title one School, Prescott Elementary, we engage with all populations.

We continue to find new and innovative ways to spread the word of FIRST. Working with youth, we were inspired to write three children's books to share FIRST's Core Values. Through our Rocky the Robot series, we provide both inspiration and fun for children through an entertaining story. These books allow us to express our team values and passions to a younger audience.

We demonstrate our robot at various events, including Fourth of July parades, Maker Fairs, Scouts of America, and exhibition contests. However, Halloween sparked our creativity with a new way to engage our community. We created spider and a dragon costumes for our robots and passed out candy to neighborhood kids. We brought them to HP's haunted house event and continue to share our prior year robots with community groups.

Expanding our outreach, we hosted The Highlanders RoboCamp, which brings in local 1st to 6th graders and teaches them about STEM and FIRST values, with the hope that they join a FIRST team in the fall. We design our programs to allow students a smooth transition into the FIRST community. One of our biggest perennial efforts to integrate FIRST into the community is the Liberty FLL Qualifier. We have run it for the past 9 years. Providing referees and judges, even Alumni return to put on this event. As always, we are ready to jump in and volunteer when other tournaments need a hand. This year, when the Weld County FLL Qualifier was running low on staff, we provided Judges, score keepers, and a head referee. 4499 has also assisted and demoed at the Northern Colorado FLL Jr. tournament for the past 3 years.

4499 opens our shop to many different teams in our area. During our current build season, an FTC team needed our assistance of our team, mentor and shop. We were happy to help, and they went on to win their regional!

We learn from our partners, increasing our own knowledge and our understanding of the real world. Many of our corporate sponsors invest their time to mentor us. Mentors Fleetwood and AMD have both aided in our learning process, and they are crucial pages in our story. Our partnerships with our sponsors are only the beginning of our exploration of the professional community. FIRST has given us lifelong skills that we are able to relay into internships and job opportunities. One member took his FIRST knowledge to create his own company that writes gaming apps for phones.

Essay - page 2**Our Triumphs**

During the 2018 Season, 4499 had 6 team members, the smallest team in The Highlanders' history. Our team was worried that we could not fulfill 4499's yearly task with so few members: build a robot, engage in the community and support FIRST programs. What we did not realize was that, with such a small team, we had a chance to become leaders and work tightly together, along with mentors and alumni. The team's success was a combination of dedication, hard work and inspiration to, not just build a robot, but create friendships, partnerships and a tight-knit family. In addition to mentoring 2 FLL teams, team members volunteered as judges and referees at 3 FLL events during the off season. And in the 2018 season, we expanded our skill sets, building more than a just robot—we learned leadership and technical skills that will take us into our 2019 season and beyond. Today, we realize that anything is possible. It will go down as one of the most amazing seasons in our history.

Our Future

While our past defines us, our future potential guides how we act and serve now. As each year passes, continue to expand our outreach far outside our local community, reaching further into the lives of youth, and creating opportunity for all. Each year builds upon what we've done, but it is our future ambitions that motivate us.

We are passionate about improving the communities we've grown up in and expanding FIRST's programs. In 2018, 4499 teamed up with Jefferson County, Colorado's second largest school district, for a six-month project working continuously with educators, principals, school board members and the Jeffco Applied Imagination STEM team in order to host a FIRST Lego League qualifier. 4499 planned and mobilized the majority of this event and found a calling to organize more FIRST events in the future. We intend to engage in more FLL tournaments at a higher level, help start new tournaments and reach out for FIRST leadership roles. Continuing our partnership with ColoradoFIRST, the Highlanders ran two FLL judge training calls during the FLL season with over 30 attendees each and will continue to do so in the future. In the coming years, we want to expand our involvement in FIRST FTC programs.

After overcoming a light membership in the 2018 season, we are proud to have 11 students. This includes 7 new team members, 5 whom are new to FIRST, and a 45% minority population. We will pass on our knowledge and work together to create new leaders, experts and committed members of FIRST.

We are a team that learns from our mentors, alumni and sponsors. Sometimes it comes in the form of designing a perfect part and sometimes failing. From failing, we have all learned so much that our next design, program or presentation is even better than imagined. FIRST has given us lifelong skills that we can take into our future. To us, FIRST is much more than robotics competitions. It's the program that gives us the chance to be who we want to be and to share our love of learning with others. Our inclination to serve our community has fundamentally developed us. Transferring our knowledge has created a foundation for the next generation. The Highlanders' progress isn't something we measure in awards or trophies; it's something we measure in our members, our community, and our stories.