



The Highlanders Chairman's Essay 2017

We, The Highlanders (HR), are built on passion - our passion for engineering, innovation, and education. This passion is the beating heart of our team that keeps us going and pushes us to aspire towards our mission. Our mission is to give children, from elementary through high school, the opportunity to pursue science, technology, engineering, and mathematics. As a part of this undertaking, we plan on providing students with a hands-on experience in STEM. HR is a community-based team that meets year-round turning us into a family. We began our journey with FIRST 10 years ago, as an FLL team and continued our journey into FRC 5 years ago, as a 501(c)3 nonprofit, Neaera Robotics. Under this nonprofit umbrella, we have the opportunity to spread FIRST through financial support.

HR creates fun, new ways to get kids informed and excited about FIRST because many students do not realize there are so many possibilities for them in STEM. For example, we have written and published two children's books that promote engineering through the intriguing adventures of a young robot and his human friend. The stories of a robot learning how to feel and robots coming together to save their environment warm the hearts of children. We have read the children's books to kindergarten classes and handed out copies during competitions. One of our most interactive, fun days of spreading FIRST is at the end of October when we have our annual Robot Disguise Day. Since our spider-bot last year was a hit, HR created a dragon-bot for our 2nd year. We were able to both use the dragon-bot to teach our members the basics of programming and pneumatics and enthuse children about STEM. Kids shouted with joy as the wings of the dragon flapped and 'smoke' (from a fog machine) pooled out of its mouth into the cauldron of candy. We are always finding new and innovative ways to spread the word of FIRST, for example we use the 4th of July parade as an outlet to spread FIRST. When our robots launched the 2014 and 2016 balls into the air, children gasped with excitement and leaned forward to get a better look at the robot. This is not the only parade we have gone to; HR showcased our robot in a Barnes and Noble Robot Parade as well. We are consistently striving for a creative way to spread our message to more people.

Special events like this are not the only place where you can see HR. We promote engineering year-round in an array of events. HR has held expos and demos since our rookie year, such as our expos at STEAM Fest for 3 year and similar expos at the Maker Faire and STEM night at a local elementary. These are just examples of the 15 expos we have been at. Expos have a range of different lessons, we even had an expo teaching people to make their own carbon fiber coasters. We have demoed our robot at 27 events over the years including (but not limited to) Kids at Heart, the local libraries, Cub and Boy Scouts, NASA Spaceflight Adventure

Week, and Geek Week. During all demos and expos, we get adults and kids alike asking us engineering questions and about the FIRST program that we are always happy to answer. Due to our team being from 9 different schools, we demo our bots at many school events. For example, during a halftime show at Liberty Common High School, we showed off our robots to advertise FIRST and recruit members.

Not only do we meet year-round, but we continue to reach out to kids throughout the year. One of our best-known events is our summer camps. We use opportunities from demos, parades, community events, along with going to many elementary schools, to advertise our various summer camps; for next summer, we are even putting an ad in the Fort Collins Recreator, the catalog from our city recreation department. This past summer we held our 3rd annual LEGO Robotics camp, where students of all experience levels learn FLL skills using the missions from previous years. It was run over the course of 5 weeks with 2.5 hours per week, with a total attendance of 10 students, allowing for them to get one-on-one attention from our team members and to work on a separate NXT or EV3 for each. This year, we added three new summer programs. As an extension of our current FLL camp, there was a two-day workshop that had 25 students attending held further south in Colorado, specifically Lakewood. Another big hit was our Water Robotics Camp with 25 students. Our camp used a WaterBotics® inspired curriculum to make an FLL-like robot to complete missions that we created. This camp was fast paced as it was over 5 consecutive days, 3 hours per day. Also, this past summer, HR had our first FLL Jr. summer camp with 6 excited kids ranging from 4-10 years in age. Working with kids so young was new to us, but it was a pure delight to see the amount of curiosity and commitment in these students. All the kids had a great time and unique summer experience. In the summer of 2017, we are planning our most ambitious FLL camp yet, an international one. HR contacted a group of eager students in India that want to join a program like this, but could not feasibly in their area. We have set up a plan with them to Skype during their camp times, send them short lessons, and teach their on-site mentors ahead of time.

Our mission is described as giving STEM opportunities to children, and HR (recognizes that some students are in environments with few chances to get a strong education in STEM fields. After an encounter in an environment like this, we decided to increase our efforts to provide the education that these children needed.) (realizes that in certain environments it is increasingly hard to get a strong education in STEM fields. In reaction to this, we have increased our focus on underprivileged communities.) Sometimes a demo at a Spanish speaking STEM organization is all the spark needed to ignite a fire, but many times you have to give a little more to make a great difference. HR has worked with Truscott Elementary, a title-one school in a nearby town. HR assisted with One Hour of Code here, teaching young minds the basics of programming. We could see the difference more in these students than others we had worked with. This alone was a challenge, but we soon took on a larger one. We started an FLL team at the Wellington unit's Boys and Girls Club of Larimer County (BGCLC) and personally funded the team. Along with the challenges of a culture difference, these students were in a different town about 45min away from our team. As we worked with these students, we realized that our

love for STEM gave us a connection with them that transcended our differences. Through this, we were able to impact the BGCLC. This opportunity gave these students the ability to pursue a passion that would be hard for them to pursue otherwise. While working with Rachel (the BGCLC director of STEM programs) over the next two years, we started two more BGCLC teams and expanded their STEM program across the county. Working with these kids and learning so much from each other is a priceless experience, so we will continue coaching the BGCLC students next year.

This is just a small glimpse of our vision to give children the opportunity to get involved in FIRST. The numbers we have are only meaningful because of the energy we see behind them. Every team we started or mentored was done so out of passion for teaching and helping the kids we meet, who are the future of technological advancement. It is this passion that drives us closer to our mission. We haven't forgotten about our younger engineers. After all, we are strong believers about starting young. One of the teams under our non-profit is an FLL Jr. team started with some of the students from our FLL Jr. summer camp. These younger kids are our future, so we are determined to walk them through the FIRST programs, like we have done with countless others. This 'feeder' system we have keeps the kids in the loop and makes the transition into our team both flawless and early. In fact, about 30% of our team is composed of middle schoolers, most of whom have been involved in an earlier FIRST program.

Our mission encapsulates as many kids as we can. With FIRST programs popping up all around Northern Colorado, HR realized that the best way to complete our mission is to expand our boundaries. We spread our impact around the state with two teams FLL that we started and mentored, a two-day LEGO Robotics Camp, and a mentored FRC team in central Colorado. In South Dakota, and then in Wyoming, we assisted in starting two new FRC teams. Next year, we will expand our impact around the world by running a summer camp and starting/mentoring an FLL team in India. With eagerness from the headmasters, principals, and teachers, HR has set up a system with a 5-branch institute with 5 K-12 schools around India to start at least one FLL team. With approximately a 12-hour difference between us and them, we will be able to Skype them during their FLL practices, which will likely be held as an elective class for students. We will even have members of HR traveling to visit this new FLL team around the world in the 2017-2018 season.

Looking at our long-term future, as a team, we will continue to pursue our mission to give children, from elementary through high school, the opportunity to pursue STEM. FIRST is not just a competitive challenge, but a family in which all the teams work together to better each and every individual. Over time, more children will have the opportunity to join our family. HR will continue to grow in impact and is determined to leave a legacy rooted in passion through every single person that has been part of our team in way, shape, or form.

Scrap-yard (move to presentation):

Partnerships and demos with sponsors

Dean's homework

Rookie booster under the umbrella

German FTC team w/ infrastructure

The Highlanders a sustainable team of innovative and inspired learners.

The numbers we have mean nothing without meaning behind them.

Outside of our umbrella, we have assisted #FIRST teams. For example, three years ago, our alliance partners, The High Fives, made it the Championship, but couldn't afford the trip. We couldn't stand see them not go, so we helped fund their trip. For FTC and FRC teams in our community, we open our shop year-round. Just last year we helped 3 teams get NASA grants. During last year's Colorado Qualifier, team 1138, Eagle Engineering's flights got canceled due to the blizzard, but their robot got there, so we spend the day unboxing their robot and getting it through inspection and worked with their team when they got there, fixing-up their robot and helping them prep for their Chairman's presentation. Not to forget the team bags and rookie survival kits with stuff that we forgot (like a lot of gaffer's tape) that we hand out to all teams.

With every student that we encounter, whether he or she is 4 or 18, we learn as much or more than we teach them. The best lessons that we learn are those of core values. These values add to our own and make our team what it is today. We are a team rooted in cooperation on the field, gracious professionalism through FIRST, and benevolence in our community. Be a team made of students from all around Colorado, HR is an agglomeration of communities. We are passionate about improving the communities we've grown up in. HR helped pack food bags for less fortunate kids for the McKinney Backpack foundation. In addition, we collected and delivered food to bring the community together after torrential rain and a devastating flooding caused unprecedented damage in many cities in Northern Colorado. Our team volunteers at an annual children's triathlon. We love cheering the kids on and seeing their exhausted but ecstatic faces as they cross the finish line where they are greeted with our past robots. Before the build season we participated in Toys for Tots gather toys for kids less fortunate than us for the second consecutive year. This last year we made dresses and pants out of old volunteer shirts that we passed on to Operation Christmas Child. Just last year we went to Kids at Heart, that provides support for families with adopted or foster children. We brightened their day by interacting with

the kids and demoing our old robots. Giving back to our community is instilled every Highlander.

Everything we have covered with you so far has been about our past. Past is what makes us who we are, but our future is what we decide to accomplish and become. As students, we are likely to graduate high school and go to college to pursue STEM. This is what every alumni has pursued, making our college rate and STEM field rate being 100%. As individuals, we will all hold ourselves accountable for the promise that we made our mentors when we joined the team and will mentor a FIRST team sometime after graduating ours. This is what leads to 100% of our alumni coming back to help and 100% registering as mentors. One of our graduates has and will continue to volunteer at the Championship as a judge and was in the WPI-FIRST video.

HR introduces them to FIRST in innovative and original ways.