

Issaquah Robotics Society

Chairman's Book

FRC 1318

2018



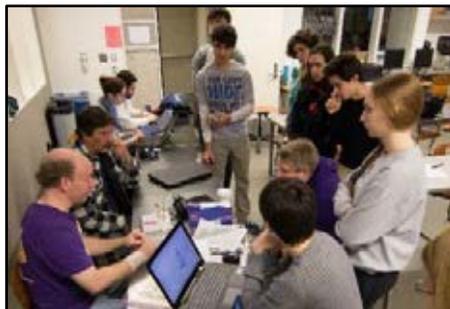
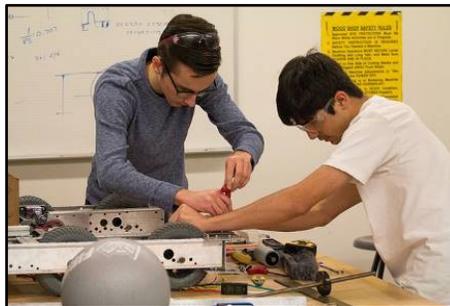
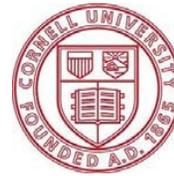
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Participant Impact

The Issaquah Robotics Society (IRS) creates unique experiences for all students. Every fall, veteran members welcome and train rookies in engineering and business courses. The skills learned, technical or not, continue to impact team graduates. IRS alumni data reveals 42% of graduates specialize in engineering and 51% in computer science. Alumni are inspired to choose STEM fields as a career choice because of the IRS. Our graduates attend universities ranging from Harvey Mudd to MIT to Stanford.

Some of the many universities team alumni have attended:



Community Impact

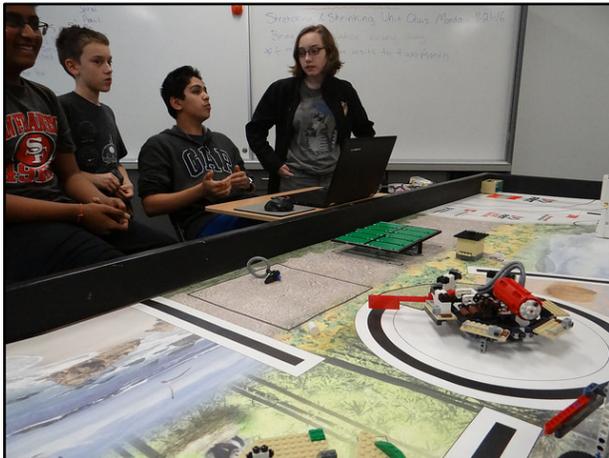
The IRS sparks interest in high-level STEM curriculum throughout our school district, the visibility of IRS at Issaquah High School motivated the school's administration to add STEM courses like computer science and engineering. Last July, we led a weekly event at the local library to teach a total of 100 three to nine-year-olds about civil engineering through Legos. We were also a notable attraction at Salmon Days, the largest festival in Washington State, which has 150,000 annual visitors.



Issaquah High School



Issaquah Salmon Days



IRS members mentor a local FLL team



An IRS member explains FIRST robotics at Salmon Days

Role Model Characteristics

IRS strives to exemplify FIRST values by promoting STEM in our community and beyond. The IRS introduces the community to FIRST and STEM through library workshops, summer camps, and the Special Olympics. Due to these events, our volunteer hours total above 800. Members participated in a team-wide gracious professionalism workshop to ensure that FIRST values are instilled and practiced in all branches of the team. IRS also sponsors and mentors a special needs robotics team for Unified Robotics.

Innovative FIRST Message

In the past two years, IRS devised and implemented the ART Project (Audit, Respond, and Teach) which emphasized community service, mentorship, and FIRST event volunteering. This year, IRS presented to U.S. Navy members about FIRST mentoring. Another IRS community outreach program is “Taking FIRST to the Streets”, which spreads FIRST to places it’s not usually seen. This includes over 50 annual venues, such as science fairs, art walks, farmers’ markets, and local festivals like Salmon Days.



(Above) The IRS brings FIRST to the local community at an outreach event

(Below) The stands at FIRST Championship Houston 2017 at the moment that the IRS’s alliance won the Turing subdivision

Starting FRC Teams

IRS cultivates team creation through community outreach efforts. We support and encourage further FIRST participation among FLL and FTC students to create a stable pipeline for FRC teams to come. Past efforts within our school district led to the creation of FRC 4131 and 2976 at local schools. FRC 3663 founder, Scott Christiansen, stated, “I credit your team with being the inspiration for CPR even existing.”

Starting Non-FRC Teams

STEM is a community building endeavor and, with our “Taking FIRST to the Streets” events, IRS facilitates this growth. An important event for us is the annual Salmon Days festival, where we provide families with information and resources to start FTC, FLL, and FLL Jr. teams. In the last 15 years, the IRS has contributed to the formation of over 20 FLL teams. This continues to be one of our primary goals in community outreach.

Assisting FIRST Teams

The IRS strives to provide assistance to FIRST teams by releasing our engineering and business resources. In 2018, three local teams attended the first ever IRS FLL-FTC open house. IRS is piloting a sister program between Eastern and Western WA teams with Team 4495. We continue to advise FTC 12136 in California, who credit us with their existence. IRS founded the Issaquah Robotics Alliance, which functions as a support system among FRC teams 1318, 948, 949, and 2976.

Mentoring FIRST Teams

IRS members mentor FIRST teams across the West Coast through consistent communication. This entails helping with design, organization, finances, parts, and more. Furthermore, IRS reaches numerous teams through the ART Project (Audit, Respond, Teach). For example, we mentored an all-girl FLL team in programming, providing female role models in STEM. We mentor Issaquah Middle School’s FLL team and local FLL team “Knights4Robotics” by providing design assistance and resources.

Sponsors & Supporters

IRS collaborates closely with a variety of sponsors, receiving funding from Boeing, Microsoft, Bre's Demo, Lifetime Muffler, Watchguard, Spacelabs, SPEEA, Issaquah School District, the Office of Superintendent of Public Instruction, the Issaquah High School Booster Club, and the Issaquah Schools Foundation. Sponsors also provide software, expertise, and machine parts. Over the past year, 1318 obtained Wells Fargo as a sponsor, contributing to 1318's sustainability.

Sponsor Partnership & Relationships

The IRS maintains robust partnerships with sponsors through demonstrations, engineering notebooks, team photos, thank-you notes, and newsletters. Team members have interned for sponsors like Microsoft, Spacelabs, and Triumph Aerospace. We give back by participating in Issaquah Schools Foundation's "Honk and Wave" campaign and by presenting at fundraising luncheons. Sponsors attend our annual Holiday Party where they interact with the team and its projects.



IRS members pose with Spartabots members after receiving the support of the Issaquah Schools Foundation



The IRS's 2016 robot holding an oversized check after a successful sponsor presentation at Spacelabs Healthcare

What Is FIRST?

FIRST is an international STEM program for K-12 students dedicated to the recognition of science and technology. Students work closely with mentors and apply STEM skills to build a robot through experiential learning that applies outside of the shop. Gracious Professionalism is practiced both on and off the field by building a fun and cooperative atmosphere at every meeting and competition. FIRST beautifully fuses fierce competitive spirit with a strong sense of collaboration.

Broader Impact

Since 2008, 1318 has lobbied WA legislators to provide \$150,000 annual grants funding FIRST teams, leading to hundreds of new teams. 2018 will see the first ever Sci-Tech Caucus in the WA State legislature, with FRC 1318 demonstrating its robot and the FIRST program to this group of pro-STEM delegates. Since 2007, our school's foundation has continued to fund robotics district-wide. Media coverage of our team continues to raise awareness for FIRST, attracting new members, mentors, and sponsors.

Other Matters of Interest

The IRS believes that being friendly and responsible members of the community is integral to fulfilling the values of FIRST. By hosting the annual PNW Social, we encourage inter-team bonding between WA FRC teams. We led a discussion on Gracious Professionalism for FRC 2557's November workshop and exposed FRC 3223 to potential mentors at a Navy Submarine Base. Consistent with our ideals, IRS members stay behind after every WA competition, regardless of the outcome, to help tear-down the field.



Chairman's Essay

Every culture, every era, has superheroes. The superhero archetype transcends language and religion, its mythic essence enduring, but altered to fit the needs of the people in that time and place. Greek Antiquity had Hercules, the Great Depression had Superman. But in our modern era, identifying superheroes is harder. That is why members of the Issaquah Robotics Society (IRS) became their own superheroes for a modern generation, grounded in reality, not myth. The IRS, FRC Team 1318, creates superheroes of STEM.

One aspect of a superhero is simple: they are reliably at their community's disposal. The IRS is just that. Endowed with students passionate skilled in STEM topics, we aim to spread excitement for innovation. One way we use this "power" is through our established STEM-awareness program, "Taking FIRST to the Streets." Taking FIRST to the Streets includes traditional science outreach hotspots, like science fairs, science symposiums, and Maker Faires, but the heart of the program takes science and technology to unorthodox venues; art walks, farmers' markets, and festivals. IRS teammates are seen at Salmon Days, Newcastle Days, and Highlands Days, which draw over 150,000 people. In recent years, the IRS has also expanded from physical streets to online avenues, amassing over 1300 page views per month and ensuring that our digital touchpoints facilitate constructive communication between our community and our team leadership. In just seven months, we connected at least three families to FIRST programs per community outreach event via a combination of our online and physical presence in the community.

Another distinct sign of a superhero is they address the needs of the people in that era. Addressing the immediate needs and problems of the community is the foundation of the IRS's sophomore ART Project (Audit, Respond, Teach), an outreach campaign hyper-focused on community service, mentoring, bolstering FIRST, and event volunteering. First, we Audit: assessing the situation by whatever means necessary. Then we Respond: giving advice, materials, tools, mentors, and students as needed. Finally, we Teach: ensuring long-term solutions and sustainability. In our school community, the programming team used STEM to streamline the efficacy of over six ASB clubs by implementing our custom attendance system, which uses blockchain technology to ensure unalterable attendance data. We also fortified our school's Special Ed program through a persistent launch of Unified Robotics, a Special Olympics program that opens robotics to special needs students. Though cocooned in red tape, members persevered to establish a Unified team and volunteer base. IRS has mentored local FLL teams for years, yet under the ART Project, we expanded mentoring efforts down to California. We mentor FTC Team 524, Northern California's oldest active FTC team, offering engineering and technical advice. We taught them by example: "[1318's] excitement and dedication to encouraging STEM was inspiring and contagious, and has encouraged [524] to try to provide the same quality mentorship to... local teams." Additionally, 1318 members mentor California's FTC 12136, the Icahn Robotics Society, or IRS, after us. We aided with sponsor acquisition, gave financial advice, and provided design clarity. 12136 credits us with the continuation of their team. IRS also assists Kittitas' FRC 4495 by visiting their campus, inviting them to strategic design sessions, sharing business materials, and teaching

advanced concepts like PID. As a pilot sister program for lessening the resource rift between Eastern and Western Washington teams, 1318 and 4495's relationship is a model for others. In December of 2016, we initiated a relationship between FIRST and the US Navy when we toured of the USS Henry M. Jackson and the Naval Undersea Warfare Center, along with students from FRC 3223. This fall, we presented FIRST to the commanding officer and staff from the Navy Recruiting District, exposing highly capable engineers to the FIRST programs. We assist our FIRST community through the Issaquah Robotics Alliance, our support system for displaced or in-need teams on the Seattle Eastside. Forms of support provided include parts donations, meeting observations, practice space, game piece and field element sharing, strategy sessions and one-on-one solution sessions. Furthermore, IRS members have contributed hundreds of event volunteer hours, accrued by members, mentors, and alumni with a fervor ignited by their time with the IRS. The ART project standardizes impactful and enduring problem solving for whichever Gotham needs it.

A striking characteristic of superheroes is that they leave lasting, positive impacts on their communities, and in this federalist society, the IRS knows that one of the most effective means of creating a lasting impact is through local government. In 2008, we were one of the first teams to petition Olympia, but our involvement remains undiminished. We participate in Legislative Action Day every year, and will soon give a demonstration at the Washington Sci-Tech Caucus, an event to discuss improving STEM education and technology developments. Yet, our legislative advocacy is not our only "super" seminal endeavor with lasting impacts. In 2007, we began petitioning the Issaquah Schools Foundation (ISF) to change their funding policy, eventually resulting in the funding and creation of over a dozen FIRST teams and robotics clubs across the Issaquah School District. As 2014 ISF Development Director Lynn Juniel puts it: "[1318] introduced the Foundation to the world of Robotics". Outside the school district, we inspired 20 FLL and 2 Jr. FLL teams. This is joined by FRC Team 3663, Cedar Park Robotics (CPR), whose head coach Scott Christiansen states "I credit [IRS] with being the inspiration for CPR even existing."

Additionally, IRS's lasting impact on STEM is prominent in our high school and our whole community. Our founders Tom and Cathy Saxton brought the first comp-sci and AP Calculus BC classes to Issaquah High, augmented by seven more STEM classes, including robotics and engineering. Conjointly, IRS members contribute to a general increase in STEM clubs, including Neuroscience Club, Astronomy Club, Coding Club, Women In Science Club, and Girls Who Code Club. Our impacts go beyond just our school; additional robotics courses at two different local high schools to the IRS, and ISF Director Robert Callahan states, "[IRS] has led the effort to make robotics a mainstay...at every middle and high school", and now, elementary schools. The IRS utilizes our abilities to make a lasting, STEM-focused impact on our community, from the local government to the school district.

When superheroes are not saving the world, they need a place of refuge. In many respects Team 1318 acts as an oasis for its members. Students look to the IRS as an oasis from antisocial behaviors and the stressors of teenage life. Student leadership and mentors alike make a concerted effort to provide ample emotional and academic support to all members who need it. As a team, we save each other.

But there is no point in being superheroes if no one is there to "save the world" when we are

gone. That is why we strive to inspire the next generation of superheroes, from both the students on our team and outside our team. The IRS is making a pipeline of super-STEM students in the Issaquah area through the extension of the ART Project that focuses entirely on youth mentoring and involvement. Affectionately nicknamed “Future Generation” outreach, this facet of the ART Project aims to ignite passion in students ranging from 4 to 14 years old through our involvement. This past season’s “Future Generation” outreach included a series of free day camps at



the Issaquah Public Library that introduced civil engineering concepts with Legos to approximately 100 four to nine-year-olds, and activity days for Cub Scouts and various FLL/FTC teams to expose younger students to our build season. Recognizing the disparity of women in STEM, we also encouraged young girls’ involvement in robotics through our female FLL mentors, and our Girl Scouts Day Camp in which we taught over 300 girls how to build and fix their own wiggle bots. These children will make extraordinary superheroes in the years to come, but the IRS is also making superheroes among our current membership. As a rule, 1318 strives to instill technical and leadership skills in students via experiential learning. Alumnus Zane Young states that “[He] was fortunate to be part of the Issaquah Robotics Society for the past two years... [His] dream job... is to design and build robots” in his interview for Geekwire’s “Geek of the Week”. Our alumni are passionate about STEM, attending institutions from Harvey Mudd to MIT to the University of London, with 93% of our graduates majoring STEM fields. After graduation, they are among those pushing the boundaries of technology, whether in biomimesis or even augmented reality.

Yes, our students are “super”, but that is only half of being a superhero. The other half is “hero”. Out of adversity, after trials of responsibility, our members chose to use their powers altruistically. In the past season alone, IRS members have dedicated over 800 hours to outreach and community service, not doing it because they have to, but because they want to. During our first annual Gracious Professionalism Workshop, our students came to an important consensus; the IRS does not teach kind and ethical behavior, but rather it instills a passion for kindness and integrity. It is that contagious passion that powers the ART Project and Taking FIRST to the Streets. It is that contagious passion that motivates alumni to use their skills to better the future. It is that contagious passion that drives current students to mentor and assist. Ultimately, that passion defines the IRS as superheroes of STEM.

Outreach Events

Art Walks

The IRS attends every Issaquah Art Walk, held during the summer on the first Friday of every month. At these art walks, students demonstrate the robot, distribute flyers about FIRST programs, and explain how to get involved.



Local Schools

Over the school year, the IRS has attended various science fairs, engineering presentations, and club fairs. The IRS has presented at schools such as Cougar Ridge Elementary, Sierra Heights Elementary, Wilder Elementary (invited by an employee from Triumph), Issaquah Valley Elementary, Pacific Cascade Middle School, Issaquah Middle School, Liberty High School, and Skyline High School.

Fourth of July

The Issaquah Downtown Fourth of July festival is a family-friendly event in the community. The IRS brings the robot to this event, and, depending on robot logistics, may walk in the parade as well.



Salmon Days

Each year the IRS attends Salmon Days, the largest festival in Washington State (which happens to be in their local community.) Salmon Days is a two-day event with booths, activities, and a parade. The IRS welcomes the opportunity to present FIRST to thousands of people who line up to use the robot under supervision. This year, they were one of the few attractions to be listed on the official festival map.

Newcastle Days

The IRS teams up with NRG 948 each September at their community festival, Newcastle Days. This small, local event is a great opportunity for these teams to introduce FIRST to the Newcastle community.



Highlands Days

The IRS annually attends Issaquah Highlands days, a festival in the local community. Robots are surrounded by bands and fun activities. Local children interact with the robot and learn about FIRST programs.



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