

Chairman's Award - Team 694

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2021 - Team 694

Team Number

694

Team Nickname

StuyPulse

Team Location

New York, New York - USA

Describe the impact of the *FIRST* program on team participants within the last 3 years. This can include but is not limited to percentages of those graduating high school, attending college, in STEM careers, and in *FIRST* programs as mentors/sponsors.

FIRST helps students on our team develop skills in engineering, software, and marketing—fostering leaders and problem-solvers. The spirited culture draws alumni back to guide younger generations, bringing the FIRST experience full circle, and this strong network of alumni and mentors helps Pulsites build connections and careers. Over 30 StuyPulse alumni volunteer, mentor, and sponsor teams, including our teacher, Mr. Blay. Members go on to pursue STEM fields, from engineering to chemistry.

Describe your community along with how your team addresses its unique opportunities and circumstances.

During COVID, StuyPulse has been active despite being unable to meet in-person. With over 50 members attending over 100 meetings since June 2020, we have maintained and expanded our strong team bonds, especially with new team members. We transitioned our tradition of Stuy Splash online and developed a new, virtual newbie education that involved programming Romis, and working with Arduino kits. We also rallied a team of members to offer CPU cycles for Folding@Home, aiding in COVID research.

Describe the team's methods, with emphasis on the past 3 years, for spreading the FIRST message in ways that are effective, scalable, sustainable, and creative. How does your team measure results?

We've continued to mentor and expand FLL teams in Puerto Rico, and we have improved other teams through FLL Clinics and scrimmages. In order to promote the accessibility of FLL teams in NYC, we created an FLL curriculum to allow teachers without technical training to mentor their own teams. Through Virtual Stuy Splash, we strengthen the skills of next-generation entrepreneurs with networking and learning opportunities. Our influence in the community has brought over 150 people to the event.

Please provide specific examples of how your team members act as role models within the FIRST community with emphasis on the past 3 years.

We use our large team size, 150 students and 20 mentors strong, to give back to the FIRST community. We created a Fix-It Crew and Mobility Missionaries, groups that help other teams resolve mechanical and software issues at competitions. Since 2012, we have hosted Stuy Splash, a series of workshops covering topics valuable for both FIRST veterans and rookies. By setting up bonding events like virtual movie nights with local teams, we boost morale and community during a disjointed time.

Describe your team's initiatives to Assist, Mentor, and/or Start other *FIRST* teams with emphasis on activities within the past 3 years.

In 2018, we hosted an FLL Scrimmage and Clinic for teams, providing workshops on EV3 and Core Values. During the 2018 NYC FIRST Corporate Challenge, we mentored Two Sigma employees, encouraging them to mentor other teams. We also mentor teams in Puerto Rico, and after the island was hit by Hurricane Maria in 2019, we raised money to help at a bake sale. We share resources from lectures to events to workspaces, and many alumni return to FIRST, mentoring StuyPulse and teams such as 2579 and 2265.

Beyond starting teams, what initiatives have you done to help inspire young people to be science and technology leaders and innovators? What results have you seen from your efforts in the past 3 years?

Many members join the team after our Open House robot demonstration, and they quickly learn to collaborate and lead their own groups. By senior year, they've already become mentors, passing knowledge on to younger members. To maximize STEM exposure and reach, we demonstrate our robots to people of all ages at various events, such as the science convention World Maker Faire NYC, Battery Park City Authority's STEAM Day, and for Two Bridges Neighborhood Council (a low-income neighborhood).

Describe the partnerships you've created with other organizations (teams, sponsors, educational institutions, philanthropic entities, etc.) and what you have accomplished together with emphasis on the past 3 years

In the summer of 2018, we collaborated with teams 5599, 2579 and 1660 to host a NYC FIRST Picnic. This event formed lasting friendships, sparking joint practice sessions and hosting teams at our lab during build season. We partner with our sponsor Bloomberg for community service events, such as planting trees on Governor's Island and hosting a coat drive. We also traveled to China annually from 2014 to 2019 to assist pre-rookie teams, helping spread FIRST to cities throughout China.

Describe your team's efforts in the past 3 years to promote equity, diversity, and inclusion within your team, *FIRST*, and your communities.

As a no-tryout team, we have a newbie education period consisting of lessons and a tournament, where new members learn skills and bond at events like game nights. We also open our lab to other FRC teams, notably 335 in 2019, 2579 in 2019 and 2020, and 426 in 2020. We promote equity by fostering a welcoming environment—our school is a melting pot and our team is largely made up of minority and low-income families. 40% of our team and 4/6 of our team's student elected leadership is female.

Explain how you ensure your team and the initiatives you have created will continue to run effectively for the foreseeable future

Our team is student run and our members gain skills in engineering, software engineering, marketing, and leadership, which they then pass down from year to year. This year we even recorded all of our Java lessons so that they may be referenced in the future. We have many alumni who return to mentor. Our team is also getting a new lab, allowing us to continue our initiative of inviting teams during the Build Season to practice and work alongside us.

Describe your team's innovative strategies to recruit, retain, and engage your sponsors within the past 3 years

StuyPulse students engage potential sponsors at demonstrations follow-up with anyone interested, and contact parents and mentors. We update sponsors with a monthly newsletter and invite them to our lab and events, even considering the fiscal calendar. Sponsors gain benefits for donations, like their name or company on our merchandise—the highest contributor even names our robot. As a 501(c)3, we have full control of our funds, allowing us to source from PayPal and corporate matching programs.

Highlight one area in which your team needs to improve and describe the steps actively being taken to make those improvements.

In the FIRST spirit, our team is always trying to increase our presence in our local community. To spread STEM locally, we demonstrated robots in the Battery Park City STEAM Dream workshop in 2020, helped kids create "wiggle bots", and gave tours of our lab during Open Houses. With our new FLL curriculum, we will begin reaching out to our list of target schools. After our lab renovation, we plan to host community workshops, events, and an engineering program during school breaks.

Describe your team's goals to fulfill the mission of *FIRST* and the progress you have made towards those goals.

As a no-tryout student-run team, we embody FIRST's value of inclusion. Every student can find their niche on the team, such as in our media team, which produces videos for outreach and social media. Over 20 years, we've grown to over 150 students and 20 mentors. The FIRST ethos of gracious professionalism rings true in our spirits—students that have graduated from the team often come back to visit, mentor, sponsor, and give back to the family our team has created and the FIRST community.

Briefly describe other matters of interest to the *FIRST* Judges, including items that may not fit into the above topics. The judges are interested in learning about aspects of your team that may be unique or particularly noteworthy.

StuyPulse has mastered the essential tenet of FIRST: fun. During each kickoff, we scoot across the linoleum as human

robots, and traditionally play dodgeball to start weekend meetings. During team dinners, mentors entertain with comedic speeches about orphaned drill bits, and the multi-cake StuyPulse birthday celebrations are simply legendary. As much as StuyPulse houses a network of passionate problem solvers and STEM-enthusiasts, our primary goal is connecting with each other.

Essay

Inclusion

StuyPulse's guiding principle has always been inclusion. Students from all over NYC attend our school—nearly half of the team comes from low-income families, and 7 are first-generation immigrants. This year, girls make up 40% of our team, and 4 of our 6 elected student leaders are female. As a no-tryout team, there is a home for students of every background.

From engineering design to software development to marketing, students have the chance to create mechanisms, write autonomous programs, and develop an entrepreneurial mindset. Following our core principle, during our annual kickoff, each member's opinion or idea is deliberated upon as a team. Through this, we have developed wild ideas collaboratively, such as our influential 2019 suction cup climber. This teamwork gives people the opportunity to pursue their interest in STEM, and creates lasting relationships between members.

"Newbie" Education

To further our dedication to inclusion, StuyPulse fosters an inviting team environment for new members, regardless of their experience level. Every year, we provide an interactive newbie education to ensure that new members have the foundational engineering knowledge to enact their ideas. This year, the pandemic led us to adapt our newbie education to a virtual format, and this platform enabled us to reach dozens of more students than in previous years. Our curriculum prioritizes key concepts and interactive projects to teach newbies the fundamental skills they need to assimilate into their respective department—marketing, software engineering, or engineering—and contribute meaningfully to our team's initiatives.

Although our newbies have yet to work in our lab, they still learn from veteran members, mentors, and each other. We ensure newbies are intellectually and socially fulfilled through the team, in spite of a virtual environment. To keep lessons interactive, we use tools like Kahoot to turn lesson reviews into competitive games, teach electronic prototyping with Arduino kits, and work jointly on engineering research and development. This year, we recruited and retained 40 new members, instilling newbies with the passion for problem-solving and exploration that defines StuyPulse.

Stuy Splash

At Stuy Splash, our annual lecture series since 2012, where participants have had the chance to hear from over a dozen guest teams we've invited over the years. But this year, we held Stuy Splash online via YouTube and Twitch. Although holding an event online was challenging, it also gave us a unique opportunity to connect with and learn from teams from around the world. We hosted guest speakers from New Jersey, Pennsylvania, California, and Australia, with over 1000 views on Twitch and YouTube. In our most recent livestream, we held a panel about adjusting to COVID with student leaders and mentors from 5 FRC teams. Our goal was to foster a sense of community among FRC teams, allowing members to express their unique experiences, struggles, and solutions. Through these virtual lectures, teams learned from each other to improve their strategies for adapting to the 2021 season.

Puerto Rico FLL

When Hurricane Maria struck Puerto Rico in 2017, countless communities were devastated. Seeking to help, our team contacted an FLL affiliate on the island and we began to mentor 6 Puerto Rican teams: the ASJ Robotigers, Robotigers II, E-brainers, the Dream Team, the ER Lego Team, Robo-X, the Knight Owls, and the Knight Hackers. Due to the strong bonds we formed—despite a series of natural disasters and forced disbandings—StuyPulse continues to mentor ACM Robotics and a home school team. We also meet informally with the former Robotigers to help them continue pursuing their passions in STEM.

China

From 2014 to 2019, StuyPulse has been invited by FIRST China to events in several cities like Zhengzhou, Hangzhou and Shanghai. We participated in workshops for several weeks, contributing parts, ideas, and advice to pre-rookie teams—some of whom are just starting to build. We held presentations for pre-rookie and rookie teams on topics from awards to electronics to pneumatics, and helped teams construct bumpers, fix electrical issues, and create mechanisms in time for competition. At the end of the event, we competed in a culminating tournament alongside the same teams we worked with and befriended. During every year we went to China, the number of FRC teams there grew, from 16 in year one to over 100 at the start of the 2020 season. Our time there gave us an opportunity to spread our passion for STEM to new teams, and create connections with more than 80 teams from 8 countries around the world—we maintain these connections to this day, even hosting teams we helped get their start when they compete at the NYC regional.

Adaptation To COVID-19

The COVID-19 pandemic hit NYC especially hard, causing our school to close indefinitely. Since March 2020, our students have been unable to meet in-person for extracurricular activities. Although COVID changed our approach to FRC, StuyPulse students continue communicating daily through Slack, where we have over 100 weekly active users and more than 100 messages per day. This year, we held team elections, charter revisions, and an interest meeting virtually. We also consistently hold team meetings 3-5 times a week via Zoom, create virtual lessons for new team members, and work on off-season projects, resulting in hundreds of meeting hours. We even hosted a competition where groups of engineering and software engineering members collaborated, each coding and modelling a robot through CAD.

Competitions

Our fundamental attitude toward volunteering at competitions is to have "a red shirt in every pit." Our team's volunteers manage the queue, pit announce, distribute safety glasses, and assemble, reset, and disassemble the field. We've also started unique initiatives at competition, such as our "Fix-It Crew" and "Mobility Missionaries." Traveling to other teams' pits, our Fix-It Crew helps teams fix mechanical issues, pass inspection, and diagnose problems. Our Mobility Missionaries group reviews other teams' code to ensure that they have functioning autonomous routines, learning languages we don't use, like LabVIEW, for this purpose. We aim to get every robot moving during autonomous and tele-op—even if we play against them. These initiatives help instill collaboration, compassion and gracious professionalism.

School Community

During our school's annual open house, we demonstrate our robot to prospective students, and countless 694 members have cited these demonstrations as their inspiration for joining the team. Our impact also reaches Stuyvesant students after graduation. Two years ago, our students and teachers met with 2 Stuyvesant alumni to showcase our robot and discuss our projects. Moved by our passion for STEM, they decided to donate 1 million dollars towards a lab renovation that will benefit our team, school and local community. Once the lab is completed, we will continue inviting other FIRST teams to share resources, and offer a practice space for underserved teams. Along with the team's usage of the lab, it will be used for robotics classes, many of which were catalyzed by our team when seeking to spread STEM beyond the boundaries of our club and into the school community.

Local Community

StuyPulse strives to make an impact on our local community. Though our efforts have been hindered by the pandemic's severity in NYC, we look forward to continuing our efforts when it is safe. Prior to the pandemic, we hosted FRC teams 335, 426, and 2579, sharing our practice field and lab space during winter break. For the past 3 years, we've expanded the annual Bloomberg coat drive, setting up donation stations at our school and in our students' homes. As a result, we gathered a total of 353 coats, which were matched by Bloomberg and sent to New York Cares. To promote STEM in our community, we also demonstrated our robots at our biannual book sales near our school and participated in local events for community organizations. This includes Battery Park City Authority's STEAM Dream Workshop, where we let aspiring young kids interact with our creations; demonstrating at the World Maker Faire, a gathering showcasing young inventors' unique resources and ideas; and a demonstration for the Two Bridges Neighborhood Council, an organization located in a low-income neighborhood near our school. In 2018, we collaborated with FRC teams 5599, 2579, and 1660 to host the inaugural NYC FIRST Picnic strengthening the NYC FIRST community. During the picnic, members from various teams met and connected with FIRST teams across the city.

To help FLL students prepare for their competition in 2018, we hosted an FLL Clinic and a Scrimmage. There, over 30 students across 6 teams were able to receive feedback on their research projects, improve their robots, practice presenting, and even participate in a mock competition. We learned that many teachers' hesitation to participate in FLL stems from a lack of programming experience, so to increase accessibility, several StuyPulse members created a semester's worth of lessons for FLL in the summer of 2019. This curriculum includes team building activities, exercises for building robots, and steps for creating a meaningful research project. StuyPulse is now building a list of contacts and schools where this curriculum will be used.

Conclusion

From transporting massive bags of donated coats to working with teams through hot summer days in China, we never forget the importance of our strength as a team. StuyPulse welcomes every new member warmly, passing down generational knowledge to help them explore their STEM interests, and before long, members become an irreplaceable presence on the team. The contributions each of us have made has turned StuyPulse into what it is today, where our role as a robotics team comes second to our role as a family. We are a family first: a FIRST family.