FIRST Impact Award - Team 7451

2023 - Team 7451

Team Number

7451

Team Nickname

AvengerRobotics

Team Location

Cumming, GA - 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 has enabled AR students to learn skills in 3D modeling, electrical work, programming, grant writing & public speaking ●These skills have enabled 100% of alumni to pursue higher education in STEM & secure internships at top organizations like NASA/Siemens ●FIRST inspires team members to become leaders representing GAFIRST at regional summits & as Mayor Pro Tem for Forsyth County SGA ●Over 50% of alumni remain active in mentoring FIRST teams & 100% of current members have competed in FTC

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

Our school community is primarily STEM based, giving us the following opportunities: ● Enabled us to establish 14 FTC teams and run 22+ FTC competitions over the past three years ● Helped us spread the word of FIRST, inviting us to advocate at over 12 open houses and 2 regional educational conferences

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?

● AR has developed a unique strategy to ensure the renewable spread of FIRST's message – The Tree of Mentorship. This approach involves guiding 14 FTC and 5 FLL teams in the area to build their own outreach initiatives to spread the word of FIRST ● Tree of mentorship has extended beyond the local communities & has had an impact in countries like Peru ● AR has been an active participant in promoting FIRST robotics at 25 events, including international conferences & meetings with county educators

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

• 100% of our current team members are active in mentoring 14 FTC teams & 30 elementary robotics teams • AR members have been working on expanding FIRST advocacy, arranging advocacy events at places such as the AEE World Expo • Have dedicated 2200+ hours setting up & running 2053 middle school robotics matches, 22 FTC competitions, & multiple FRC competitions • Have taken initiative to

make STEM more accessible to all, developing an app to help children with autism better express themselves

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

• AR has started & mentored 14 FTC teams providing materials, mentorship, & training courses resulting in 25 state-level awards • Have mentored 5 FLL teams in the past 3 years, 2 of them qualifying internationally • Built an open source FTC training program, including 14 videos, highlighting the award submissions, design, & engineering techniques; Participating teams saw a 30% increase in average OPR • Became a destination Einstein during COVID, opening our workshop & field to 4 FRC teams

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?

•Mentored 12 middle school robotics teams, & hosted 2 summer camps for CAD and design •Hosted & volunteered at 26 middle school robotics competitions, providing teams a place to compete in our region, turning our comps into the largest in the southeast •Held 16 STEM nights at local elementary schools guiding 100s of kids towards FLL programs •Ran 12 highschool info nights, recruiting 40+ members to FTC teams this year & increasing the participation in our school's engineering program by 3x

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

●Partner with ICNA to coordinate local refugee relief efforts, giving 500 families food & clothing ●Work with our sponsor Lowes to source materials & build an FRC practice field ●Collaborate with Forsyth County Parks and recreation to host & run park cleanup events ●Support ALA, an organization that provides for children with childhood cancer to raise ~$800 ●Spoke to Ukrainian team 8504 Yovi to raise awareness about the Ukraine-Russia conflict, & raised money to support 50+ Ukrainian families

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

• Ran 3 Girls in STEM events in the past 3 years, giving over 165 girls the opportunity to explore robotics and STEM related career pathways; resulting in a 220% increase in female participation on AR & 3x as many women in our school's engineering program • In addition, we've done extensive groundwork to train mentors & ensure that everyone on our team feels safe, comfortable, & included

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

● Rookie members are given 1 month of preseason training seasons led by veterans; covers: award submission, sponsor management, email writing, electrical & mechanical ● Training sessions include hands on experiences where rookies can practice new skills under veteran guidance ● Outreach initiatives have detailed growth goals for next 3 years, & means to achieve these goals in ongoing outreach and impact documentation ● Future members can reference these documents to sustain our initiatives

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

past 3 years

• Use sponsorship packets to showcase what our team has done and how we have excelled in the past 3 years • Utilize monthly newsletters that we send to our sponsors where we showcase what our team has done such at our outreach events and competitions • Host end of the season banquets where we invite our sponsors and appreciate them for sponsoring us • Make custom plaques for each sponsor to thank them for their support

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

A current issue is our struggle to follow through with tasks. To resolve this, we've implemented : ●Slack: Provides the entire team a common place where the entire team can not only give but also receive updates regarding the progress of each task, allowing us to monitor progress and retain accountability for task completion ●Scrum Board: Team members can describe ongoing tasks, needs, & finished tasks particular to each subteam; helps us set harder deadlines while preventing overlap

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

AR strives every day to encourage the discovery of STEM through fun events such as Elementary STEM Nights, FIRST mentorship, and our Girls in STEM Events. In addition, we've started one of the largest FTC leagues in the southeast. Not only does AR promote the growth of STEM and innovation, but also the importance of inclusion. From supporting refugees in Afghanistan and Ukraine, to inclusion on our own team, we work to make a positive impact on everyone's lives.

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.

• Started #FIRSTGOESGREEN, providing recycling facilities at regional FIRST competitions and middle school robotics competitions, collecting 1000s of plastic bottles and aluminum cans • Built a middle school robotics ecosystem in our county, hosting over 2160 matches in the past three years, serving 83+ teams • Connect with the community: volunteer at retirement homes, help run pet adoption days at dog shelters, educate refugees to prepare them for jobs • Minorities make up 64% of our program

Judge Feedback

Who/When	Feedback
Bryan Haynes Apr 10, 2023 11:58:46 AM EST	**What are some ways in which we can impact more people and better represent FIRST through our outreach?** **An area the team has an opportunity to improve.** **Something that really impressed the judges.**

Essay

#COMMUNITYFIRST

Founded in the back of a high school garage by 12 seniors with a set of tools, 7451 AvengerRobotics has

grown to encompass over 140 superhero scholars since we opened in 2018. Throughout our journey, we've been dedicated to inspiring those within our community to explore the amazing world of STEM by creating new opportunities for middle school and elementary school robotics in a county that lacked either. By helping foster the next generation of STEM scholars, 7451 AvengerRobotics hopes to build an environment centered around a sustained impact.

ELEMENTARY

Since 2018, AvengerRobotics has had a mission to create a community centered around robotics, and the first step towards that was at the elementary school level.

Starting in 2019, we've run over 16 elementary school STEM nights all over the county, with a focus of providing kids with hands-on STEM activities and opportunities to drive FTC robots from previous seasons. At each STEM night, we seek to break the boundary between students and their access to STEM at a young age by informing children and their parents about local engineering and robotics programs.

The amount of rising interest in robotics and engineering was severely unmatched by the lack of support elementary school robotics teams in our area received. Recognizing this, we began mentoring elementary school teams in our region, providing teams with the resources and technical support they needed to have a successful season. Over the past two years, we've mentored over 30 elementary school teams, with many of them achieving success at the state and national levels. In addition to in-season mentorship, we've run 2 summer camps where we helped teams kick off their seasons early by assisting them to start their STEM notebooks and robot designs.

But we're determined to implement permanent change; we want to build an ecosystem. We saw that vision come to life with elementary school robotics competitions. Over the past year, we've hosted and run over 180 matches, with teams from all over the county getting a chance to participate in one of the first in-county tournaments ever held.

MIDDLE SCHOOL

Middle school is oftentimes the first step into the robotics world for many kids in our community, and we've been heavily involved in making the experience special.

Previously, our community did not have local middle school robotics competitions or provide the resources that existing teams needed to sustain themselves. As a result, middle school robotics was often overlooked. However, over the past five years, we've put our efforts into rejuvenating our local middle school robotics scene, running 26 tournaments with over 2500 matches, 2053 of those being in the last three years alone. With over 83 teams in attendance, our league meets have become the largest ever hosted in the Southeast United States.

Since 2019, we've also been providing the middle school robotics team with support. Our primary form of support is our mentorship. We've run 3 middle school summer camps where professionals and AvengerRobotics alumni help teams understand concepts such as the implementation of gear ratios and virtual four bars. We've also mentored over 25 teams in the region, and some of them, including an all-girls team, has achieved international success with our support.

Our involvement in middle school STEM development is not limited to just robotics. We've attended the county technical fair, Career Technical exhibitions, and 12 robotics open houses, encouraging middle schoolers to have a hands-on experience with the technology we use during our build season and also get a glimpse into what FIRST robotics is about.

HIGH SCHOOL

We have started and mentored 14 FTC teams over the past 3 three years, establishing one of the most extensive FTC programs in the Southeast to serve over 140 brilliant young minds. We've hosted and run 22 FTC meets, and 3 internal scrimmages, accruing 25 state-level awards. Over the past year, many of our teams have also ranked within the top 200 in the world.

To better equip FTC teams worldwide, we have developed a free, detailed FTC training course open to FTC teams worldwide, compiled from years of experience to inform FTC teams about design, CAD, outreach, programming, and other aspects of running a successful team. In the past few months, these course teams have seen their average OPR rise by 30%. Furthermore, AvengerRobotics members have also made 14 training videos focusing on FTC mechanical concepts and award submissions, amassing over 778 views on their videos over the past two years.

In 2022, we had the unique chance to present at the annual GAFIRST symposium at KSU. Our training focused on teaching FIRST teams how to build and sustain impactful outreach programs. Our FTC presenters showed teams how to tailor their engineering portfolios to win awards.

AvengerRobotics's outreach follows a cascading structure from highschool to elementary school, which we've dubbed The Tree of Mentorship. As a result of this, our FTC teams have been emboldened to build housing centers for 60 orphaned girls in Peru, spread awareness of environmental debilitation, and even help poor farmers in underdeveloped countries. Many of these FTC teams have also inspired FLL teams to make a difference in their own communities.

AvengerRobotics recruits students to our school's mechatronics engineering program by raising awareness at FIRST events, county conventions, and middle school robotics events. As a result, the program has grown from just under 60 kids to well over 200.

NON-STEM AUDIENCE

Our love for the community isn't restricted to just STEM-related outreach. In the past two years, AvengerRobotics provided food and clothing to over 500 refugee families in the Atlanta area by working with the Islamic Circle of North America (ICNA), an international refugee aid organization. A few superhero scholars offered Microsoft Word and Excel workshops to prepare Eritrean refugees for the job market. As a result of the Ukraine-Russia conflict, we worked with Ukrainian FRC team 8504 YoVi to increase awareness and raised money to support 50 displaced Ukrainian families.

AvengerRobotics ran two events to inform senior citizens in our community about common internet scams and malware so they can avoid falling victim to these crimes.

We've supported two events at a local animal shelter adoption event, using robots to shoot tennis balls,

and helping our furry friends find a forever home.

Recently, we worked with Access Life America, to increase awareness about childhood cancer and raise approximately $800 to cover living costs and medical expenses of families stricken with childhood cancer in India

ADVOCACY

We had the honor to present about FIRST and STEM on multiple platforms. In 2019, we spoke to Automation Direct about FIRST's impact on our community. We have talked about FIRST at our local Engineering, Mechatronics, and Energy Advisory Council Meetings where we update engineering companies and high school engineering teachers about how as a community, we can better prepare students for the future of STEM.

In 2022, AvengerRobotics expanded its advocacy, by presenting to other CTSOs (Career Technical Student Organizations) about FIRST robotics at the annual regional leadership conference. Moreover, we sent representatives to the largest engineering convention in the United States, spreading the word about FIRST robotics to over 100 organizations from 20 different countries.

#FIRSTGOESGREEN

To increase access to recycling in many high school and middle school robotics events, AvengerRobotics set up recycling bins at 6 robotics events that we've attended over the past year. We've collected over 110 pounds of recyclable waste at middle school events in 2022 alone! To encourage other teams to pursue environmental sustainability in their own localities, at the beginning of the FRC season this year, AvengerRobotics launched our FIRSTGOESGREEN Instagram account, reaching out to other FRC, FTC, and FLL teams.

We've run 5 in-person trash cleanups, in partnership with Forsyth County Parks and Recreation to keep trails and parks clean.

As part of our FIRSTGOESGREEN initiative, we've reached out to our partner, Georgia Tech to learn more about environmentally sustainable engineering. We have further reduced our carbon footprint within the classroom by recycling failed 3D prints into new filament, and by choosing a t-shirt provider dedicated to repurposing plastic waste into clothing.

INCLUSION

Our members come from a variety of different backgrounds, guaranteeing that no one is discriminated against for their gender, grade, race, identity, or experience level. In particular, we have recognized the lack of women in STEM, and have worked passionately to increase female participation in STEM programs. Over the past three years, we have run 3 women in STEM events, with over 165 girls in attendance. Even the challenges of COVID didn't slow us down, as we partnered with Walton Robotics to present to over 100 girls about FIRST and technology.

Recently, we ran another Girls In STEM event aimed at exposing middle school girls to the STEM-based pathways available in our county. At this event, introduced around 50 attendees to FTC, FRC, laser

engraving, programming, and electrical engineering.

Our efforts have resulted in a 300% increase in girls in our school’s engineering pathway and a 220% increase in girls on our FRC team over the past 5 years.

#AVENGERSASSEMBLE

At AvengerRobotics, we hope to turn every interaction into a life-long impact. Through our Tree of Mentorship, we redefine robotics teams as more than just a group of kids, but rather a force for change within their communities. Together, we strive to inspire those who we meet and develop an ecosystem of superhero scholars who exemplify FIRST’s core values.;