

Chairman's Award - Team 6909

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2020 - Team 6909

Team Number

6909

Team Name, Corporate/University Sponsors

BOSCH/Research & Solution Co., Ltd./Chiba Institute of Technology/MISUMI Group Inc./nulab inc./SCHUNK Intec. K.K./YMIRLINK/Progate/SAKURA Internet Inc./Autodesk/D&P media group/HAKKO Corporation/Shiratori Pharmaceutical Co. Ltd/CYBERDYNE, INC./NAKAJIMA ALLOY CASTINGS Co.,LTD/Altech Corporation/Internet Initiative Japan Inc./TAKTOPIA & Co./STEMON&Family/Community

Briefly describe the impact of the *FIRST* program on team participants within the last five years.

Through FIRST programs, members get a taste of the real world, which most high school students do not have access to, by cooperating with companies and communities, volunteering, and learning the importance of teamwork. We understood more about each of our personalities and local communities and we gained a global perspective, which allowed us to recognize both the advantages and disadvantages of our community and let us work toward improving our community with what we have learned.

Describe the impact of the *FIRST* program on your community within the last five years.

By encouraging broad range of people through outreach, we have been able to provide them with much wider choices in their future careers. We have consulted with cities and ministries to grow the FIRST community in Japan to achieve our ultimate goal that is to completely change the negative culture that surrounds STEM in Japan so that more people feel familiar with and confident in STEM. We also worked with Chiba and Narashino cities on educational outreaches such as lectures, and workshops.

Describe the team's methods for spreading the *FIRST* message in ways that are effective, scalable, sustainable, and creative.

We reached 41,000+ people in person and 4,000,000+ people through media. We provided people of all ages with opportunities to learn about STEM through more than 30 free engineering workshops and exhibition at more than 45 events such as governmental symposium, and Maker Faire Tokyo. We assist others to join FIRST by providing all resources in both Japanese and English and publishing more of them with FIRST Japan. We always pursue the best way to teach about FIRST by people we are teaching it to.

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

By engaging in many outreach activities and sharing our resources with other FIRST teams, we spread our team spirit and missions to encourage them to be more cooperative. By taking the initiative to engage in outreach events in Japan, other teams were able to recognize the importance of outreach. Members act with a high level of gracious professionalism and respect for others. This fosters our cozy tight-knit community that builds upon the old proverb of "each one teach one."

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

We work together with FIRST Japan to form a solid FRC community in Japan. We have been creating publicity materials about FRC for FIRST Japan, started and mentored 2 Japanese FRC teams; established a fund of \$1,000 for Japanese rookie FRC teams; created FRC database and the Wikipedia page on FRC in Japanese. Last summer, we had FIRST Japan and 5701 join us at Maker Faire Tokyo to which more than 24,000 people visited in two days.

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

We work with a public school in Tokyo to grow FLL in their community. To support more people to form FLL/FLL Jr. teams, we started a project in which we mainly support them online. We started to work with our partners on this project so that more youths have opportunities to participate in FLL/FLL Jr. without having to go to commercial robotics programs, which currently have most of the teams in Japan. Ultimately we hope to embrace the FIRST pathway to all the youths in Japan.

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

We started FRC Japan Alliance in which all FRC alumni, members, and mentors in Japan communicate and help each other on daily basis by sharing the knowledge each of us has. We started to meet once a month with FIRST Japan and all Japanese FRC teams to cooperate more efficiently. We also created FRC database which includes detailed technical tips, outreach ideas, our team documents such as marketing materials, and safety manuals, etc. We also practice CAD with other FRC teams as well.

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)

We started and mentored 2 FLL teams and 2 FRC teams in Japan. In any FIRST program, the lack of resources in Japanese has been a serious obstacle for the students. So, we create them in Japanese and share them with the teams in need. We also make sure that our support can be accessible from anywhere, anytime by creating both online workspace and physical meetups. With our respect to individuals' uniqueness, we help teams to create their own culture by not being pretentious of our advantages.

Describe your Corporate/University Sponsors

BOSCH, Research & Solution Co., Ltd., Nulab Inc, MISUMI Group Inc., SCHUNK Intec. K.K., YMIRLINK Inc., Aisin Seiki Co., Ltd., Progate, Inc., SAKURA Internet Inc., Autodesk, Inc., HAKKO Corporation, CYBERDYNE, INC., NAKAJIMA ALLOY CASTINGS CO., LTD, National Instruments Japan Corporation, TAKTOPIA & Co., Altech Corporation, D&P media group, SHIRATORI Pharmaceutical Co., Ltd, Chiba Institute of Technology, FIRST Japan, our friends and family, and 50+ anonymous partners.

Describe the strength of your partnership with your sponsors within the last five years.

We have established a strong mutual relationship with our sponsors as partners to work towards our team missions together. Our partners have provided us with financial support, parts for our robots, tools to build/code, and professional advise. We strengthen our relationship with them by displaying our robot and giving presentations at corporate events, and holding tech workshops together, which have been featured in various media including nationwide television networks and newspapers.

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

FIRST is "More Than Robots." It's a community where you can find your real passion. It's about understanding and cooperating with your own community. Its welcoming, tight-knit atmosphere allows you to live in a bias-free environment. Through FIRST, you will get to meet people from different walks of life, whom you wouldn't elsewhere. You will foster your limitless potential and skills.

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

As the number of FRC teams in Japan, which is 3, shows clearly, it is very difficult to participate in FRC from Japan. Here are top 4 reasons: No tax breaks under Japanese tax laws for supporting FRC, difficult team building due to prejudice against women in engineering, high cost to participate even an FRC regional, and bad timing of FRC schedule (the infamous university entrance exams in February, and the end of fiscal year in March).

For FRC teams older than 5 years, briefly describe your team's broader impact from its inception.**Team Captain/Student Representative that has double-checked this submission.**

Rina Takagi

Essay

Team 6909 SAKURA Tempesta is passionate about making our dreams come true, no matter how difficult it can be. We are based on Chiba Institute of Technology, consisting of students from 13 different schools in 5 different prefectures. More than 50% of our team has been female and 80% of the leadership roles have been served by them. From the very beginning, we have been doing our best to change the interpretation of STEM by inspiring people in Japan to explore their infinite potential with true passion. Our core team missions are:

- to provide more people with free opportunities to learn engineering, no matter what circumstances they are under or who they are,
- to encourage high school students, especially young women, to be more interested in STEM and to create a future where anyone can foster their skills in STEM, and
- to increase the number of Japanese FRC teams in order to hold an FRC Regional competition in Japan.

In addition to robotics, we put a strong emphasis on outreach activities. Under the missions above, we have engaged in tremendous outreach efforts, generating more than 3300 student-hours of community service in the past two years. After the efforts and struggles, we have been featured in 30+ online news, 5 TV shows, a radio broadcast, and 10+ newspapers, reaching out to 41,000+ people in person and 4,000,000+ people through media.

There are many unique hardships in Japan to participate in FRC. We will list the top three of them and explain what we did to overcome them.

[The hardships]

-Problems in Japanese engineering education-

Many people in the world still believe people in Japan have access to engineering education from a young age due to the global presence of automobiles and consumer electronics companies. Yet, in reality, unless you go to a technical high school or an expensive after-school robotics school, you will not even be able to get a taste of engineering. The Japanese government has finally started a program a few months ago to support future engineers, but only for technical high school students that sum up to only 1.5% of the entire population of high school students in Japan; the other 98.5% do not have access to engineering education at a reasonable cost. We know from our experience that neither prior knowledge or significant interest are needed to start their paths in engineering, and that there are people who would be immersing themselves in the field if they had an opportunity. This is why we strive to encourage and provide them with free opportunities to involve not only in engineering, but all STEM fields.

-Environment that surrounds women in Japan-

According to OECD, in 2016, only 16.7% of female students in Japan indicated interests in STEM, whereas in western countries 43.6% did. Even though people are aware that it is problematic, not many seem to take immediate actions. It must be noted that, according to the Japanese government, more than 50% of people in Japan believe women should stay at home once they are married instead of work. This "tradition" has even led to intentional manipulation of women's scores in their entrance exams for undergraduate medical programs at universities. Unsurprisingly, in the Global Gender Gap Report 2020 by WEF, Japan has ranked 121st out of 153 countries, down from 110th the previous year.

-Difficulties in fundraising as students in Japan-

Unlike the US, companies here can receive tax relief by supporting only government approved NPOs, about 1,000 out of 50,000+ NPOs. Therefore, companies hardly support ordinary high school students like us, and it is considered abnormal that high school students fundraise. We also have limited access to grants provided by FIRST.

Here are our solutions to tackle those hardships.

[Free tech workshops for middle and high school students]

We held more than 15 free tech workshops for youths with our corporate partners by December 2019. Last summer, we designed and held one with MISUMI Group Inc. for secondary school students. There were 35 participants ranging from 7th to 11th grade. They built pneumatic robots that shoot balls in about 4 hours and then competed against other teams. Although most of them did not have prior experience in engineering, everyone was able to enjoy it very much. A participant said, "I just came here without any interest in engineering because my father made me apply to, but now I'm really curious about the field." TV Tokyo, a nation-wide Japanese TV station, used an entire episode of a TV program to feature our team, this workshop, and how we cooperate with MISUMI.

[STEM Challenge, RIKOCHARE]

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This is a Japanese governmental project to encourage more women to forge their careers in STEM fields. We have held free all-girls engineering workshops in Shibuya, Tokyo with BOSCH every year since our first season. This workshop has been so popular that there are always at least twice as many applicants as the capacity, and it was even featured on the front page of a nation-wide newspaper, The Nikkei. We also ran an exhibition booth at a girls' education symposium held by the Cabinet Office of Japan.

[Malala Fund]

Our passions and efforts to close the gender gap in STEM have been recognized not only nation-wide, but also world-wide. In March 2019, we were invited by Malala Fund to present our outreach efforts and discuss girls' education with Malala Yousafzai and Dr. Mukai, the first Japanese female astronaut. The Malala Fund even came to 2019 FIRST Championship Detroit to do close coverage on us and our team founder, Kanon, and to learn more about FIRST. They published an article and a YouTube episode about us in their project, "Roll Call."

[Programs for children]

We have held free tech workshops for kids every year ever since our rookie season, all of which are designed and run by team members. The participants not only get the chance to program robots, but also to build the robots by themselves. Despite some saying that it is too challenging for kids, they were able to have so much fun succeeding with just a little help. Seeing their huge smiles always reminds us of the genuine excitement of being a part of STEM community and it has driven us to immerse ourselves in STEM.

[Major activities to support FRC and FIRST in general]

- Had a meeting with Consulate General of Japan, the director of FIRST Japan, and Don Bossi at 2018 FIRST Championship, where we discussed how we can grow FRC in Japan. After that, we had an opportunity to meet with Dean Kamen and Don Bossi, to talk more about growing FRC in Japan.
- Created FRC committee in FIRST Japan
- Created official FRC webpage, wikipedia page, leaflets, and videos for FIRST Japan all in Japanese, which had never existed before
- Requested two ministries of Japan, METI and MEXT, for their official support to FRC in Japan
- Hosted briefing sessions on FRC in Tokyo with FIRST Japan for people who are interested in participating (The event was streamed on YouTube for remote audience.)
- Created FRC Japan Alliance where all FRC mentors, members, and alumni in Japan help each other on a daily basis by sharing their knowledge and resources.
- Created FRC database in Japanese that includes not only technical resources but outreach ideas and marketing materials in Japanese.
- Shared 10+ outreach opportunities with other teams. (e.g. Last year, we gave a presentation on FRC and ran the biggest exhibition booth with Team 5701 and FIRST Japan at Maker Faire Tokyo, where we demonstrated our robots.)
- Plan to hold the first FRC off-season competition in Japan together with FLL and FLL Jr. Open International Japan 2020 in Nagoya this May.
- Help FIRST Japan find possible sponsors (e.g. Last September, we connected FIRST Japan with LINE corp., who is about to support FRC.)
- Mentored two FRC teams
- Established a fund to provide Japanese FRC rookie teams with \$1,000 each.
- Volunteered, ran booths, and gave presentations at all FLL and FLL Jr. Regionals in Eastern Japan and FLL and FLL Jr. Japan Championship for the past three years
- Mentored FLL teams and launched a project to create and mentor our own FLL teams to promote FIRST pathway in Japan

[Relationships with local communities]

- Had five meetings with the mayor of Chiba City
- Invited by Chiba City to give a 70-minute lecture at their Future Scientists Program
- Ran an exhibition booth and held programming and robotics workshops at Chiba City Friendship Center for Children
- Gave a presentation and ran an exhibition booth at Presentation Day by CoderDojo at Kanda University of International Studies every year.
- Had four meetings with the mayor of Narashino City
- Featured in a magazine by Gender Equality Center and local newspapers in Narashino City,
- Volunteered and exhibited panels at the biggest community center in Narashino City

[Others]

- Served as volunteers at VEX robotics competitions held at iREX 2019, one of the world's biggest robotics expositions
- Raised \$700 to support victims of typhoon Hagibis that destroyed our hometown in October, 2019.

Not only our partners but others have recognized us for all of our consistent hard work. In recognition of our efforts to close the gender gap in STEM, BANDAI SPIRITS chose us to gift their robotics kit to even though there were only 5 others chosen out of 500+ applicants. In addition, our partner, AUTODESK Japan, not only featured us on their magazines, but also let us present our efforts to executive managers of AUTODESK and AUTODESK Japan including CEOs and Vice Presidents. Andrew Anagnost, CEO at AUTODESK, said "I'm so impressed that I don't know what to say."

SAKURA Tempesta invests in putting together a brighter future. Through borderless collaboration and mutual efforts, we further strengthen our community, support and grow the innovators of tomorrow, expand the reach of FIRST across the country, and plan to grow a tree of FRC with just three flowers into a tree in full bloom.