

Chairman's Essay #6

LASA Robotics: building people today to conquer tomorrow. From the Liberal Arts and Science Academy High School in Austin, Texas, Team 418's mission is to teach engineering and design concepts to youth as well as build communication and teamwork skills through a robotics competition format. The team, which has grown from 5 members in 2000 to 47 members today, succeeds in four main categories: mentorship, strong partnerships, raising awareness, and inspiration.

Mentorship reflects our belief that if you have knowledge you should share it. To accomplish this, we created a three-part mentorship program, the basis of which is *student-to-student* mentoring. Each student is assigned a student mentor, whom they work with and learn from throughout the competition. Our team's structure is built around this ideal, electing experienced members to leadership positions to mentor new members. *Mentor-to-student* mentoring is also a key factor in the success of our team. Our mentors are experienced engineers, and work with us every day to help us accomplish our goals and fulfill our team's mission. These esteemed volunteers donate their time to teach us technical, leadership, and problem-solving skills which our students use in the classroom, at college, and beyond. The final stage is *team-to-team* mentorship. We mentor teams 647, the Cyber Wolves; 2158, the AusTIN Cans, who won the Lone Star Regional Rookie-of-the-Year Award in 2007; and 2468, the Chaps who also won the Rookie-of-the-Year Award in 2008. Purple Haze's students gain valuable teaching and technical skills from this system, giving our members a clear advantage when competing for scholarships and jobs.

418 has developed several partnerships within our community that enable us to learn from professional engineers, gain valuable experiences, and expand financial support for our team and FIRST. We maintain close partnerships with our sponsors: 3M, National Instruments, BAE Systems, and Qualcomm, who provide us with many learning opportunities and help us connect with professionals. For example, engineers from BAE Systems recently visited our school to demonstrate one of their new products and share with us their engineering process behind the design. We also expanded our continuing partnership with National Instruments this year to assist them with the development and debugging of the NI-cRIO FRC control system. As an official Alpha team, it was our team's job to pre-test the initial NI-cRIO FRC control system and ferret out problems before handing it to the Beta teams; our students worked directly with NI engineers on-site helping them find and fix bugs and gaining valuable work experience. We also donated one of our previous *FIRST* robots to NI for testing the NI-cRIO on an FRC robot, and it was used to initially prototype and demonstrate the NI-cRIO system to the FRC Game Design Committee. Our team also represents both ourselves and *FIRST* at the annual NI-Week conference and NI company meetings to form partnerships with potential new mentors, sponsors for *FIRST*, and local robotics teams. National Instruments has also recruited 418 to assist with a new off-season FRC scrimmage event during NI-Week in 2009.

Educational partnerships, such as the one we have with the University of Texas at Austin, are also highly valued. Through our partnership with UT and *FIRST*, our team hosted a *FIRST* LEGO League qualifier tournament at our school. LASA Robotics team members also volunteered at the Central Texas FLL Championship Tournament, representing 418 as official sponsors of Central Texas FLL. For the past five years, the UT chemical engineering department also invited us to present at UT's annual Edison Lecture Series, an event that gives elementary and middle school students a chance to visit a university campus and attend a session devoted to

science and engineering. Participating in this event has allowed many of our team members to network with leading engineering professors at the university. Our participation in *FIRST* has enabled us to create partnerships with other high school robotics teams as well. In the fall this year, we gave a presentation to FRC rookie teams registered for the new Dallas regional. We gave suggestions for build season preparations as well as answered any questions they had.

“We are sincerely thankful for everything you did to help us get the new teams familiar with FRC. We are thrilled to have such a strong relationship with your team and look forward to working together in the years to come.”-John Shellene, Regional Director North Dallas.

To form new partnerships and enhance the robotics community in Texas, we are in the process of creating Central Texas Robotics, an organization to aid Central Texas teams by assisting with financial support and advice. Our goal with this organization is to allow more FRC teams to compete and achieve long-term success, making opportunities available to more students.

Raising awareness throughout the entire community about *FIRST* and STEM education is a yearlong initiative. This year, to increase awareness and recognition of the *FIRST* program, we sent invitations to the Lone Star Regional to national, state, and city government officials, Austin school district officials, and our family supporters to encourage them to see our passion for the exciting *FIRST* competition firsthand. We also raise awareness through robot demonstrations every year, over 150 in the past 10 years. We began a new community event for 2008 and 2009, called the Wii Partii. The function incorporates a Wii tournament and raffle with a technology-themed carnival. The fun and games attracts the community to the event, where they also learn about *FIRST* through our robot demonstrations and team information booth.

To reach a larger community, we partnered with teams 2158, 2587, and 2583 to demonstrate the 2008 challenge, Overdrive, at the largest DIY Festival in the world, Maker Faire. 32000 people attended the event and viewed our robots and booth, which provided information about how to get involved in a *FIRST* team. We also partnered with a local movie theatre to make a booth for children to drive small robots to promote *FIRST* during the premiere of the movie WALL-E. This activity was such a huge success that the theater has invited us back to do more demonstrations during the premiere of different movies. This is a great partnership that attracts young children and their parents to science and engineering.

Through our partnership with National Instruments, we received an opportunity to raise worldwide awareness of the *FIRST* program through writing an article for EE Times magazine. The student-written article, featured on the first page of the magazine as well as on their website, introduced our team and explained our unique robot designs for the 2007 and 2008 competitions. We were very proud to be selected for this honor of representing the *FIRST* Robotics Competition to the engineering world. Our award-winning control system was also displayed in the *FIRST* book, Behind the Design, twice in the past three years.

Our passion for teaching others about science and technology inspires our school and community. New students join from across the Austin area after participating in our community events. Our sister school, with whom we share a campus, is planning to start an FTC team next fall with 418's financial support. 98% of our alumni go on to study an engineering-related field in college. They also volunteer for FRC Regional events in their area as well as return to LASA Robotics as mentors.

An annual team activity is inspiring the children at the Helping Hands Home for abused and neglected children to believe that they can become engineers and scientists when they grow

up. We create fun and simple science experiments for the children as part of a Science Discovery Camp to help them explore their interests.

SMART Camp, which stands for Science, Math, and Robotics Technology, is our most popular community outreach program. The camp began two years ago with 1 session and grew to 3 sessions this summer. At the camp, team members help elementary and middle school kids go through the process of designing and building LEGO robots. They then get to program their robots and put them to the test! Having this experience inspires the children to become more interested in STEM activities, and go on to participate in activities and competitions such as FLL. The camp has become quite well known in the Austin community, since it offers children a unique and fun learning experience.

"My school is starting a robotics club this year for the 4th and 5th graders. I will join next year....Thank you so much for spending the day with me and teaching me about robots. I had a great time."-Lauren, SMART Camp participant.

Purple Haze has inspired our national and local governments as well. After receiving recognition from the Austin Independent School District, Texas Senator Kirk Watson sponsored a proclamation, acknowledging our hard work to promote STEM activities. We were also honored by a group of senators who visited our team to learn about our unique program of integrating STEM curriculum through robotics competitions in order to establish similar programs in their own states.

FIRST has contributed greatly to our growth, and has enabled us to develop into a knowledgeable and efficient team. With the experience that we have gained from being FRC participants, we have been able to grow as individuals, impact the lives of numerous high school students, and reach out to members of our community by allowing them to discover their interest in science and technology. To this day, our dedication drives us to spread *FIRST*'s vision of creating a world where science and technology are celebrated.

Executive Summary

1. Impact of FIRST on team participants 483

Academic Success

3 students have received FIRST scholarships.

100% high school graduation rate and 98% go on to study engineering at college.

100% of our students participate in community events.

Life Experiences

Access to professional engineers at National Instruments

6 students have used their skills learned through FIRST to receive internships and jobs while in high school.

LASA Robotics members learn communication, leadership, and teamwork skills while working together to succeed.

2. Role Model Characteristics for other teams to emulate 494

Mentorship

We use 3 forms of mentorship: student-to-student, mentor-to-student, and team-to-team.

Partnership

We have growing partnerships with FIRST, our sponsors, the University of Texas, and other robotics teams.

Raising Awareness

Our passion to spread FIRST's mission is evident through our numerous robot demonstrations and communication with government and community figures.

Inspiration

LASA Robotics inspires children and community members to get involved in science and technology.

3. Impact of FIRST on team and community 487

School Impact

Students now come to LASA High for the robotics team.

Finances secured for new FTC team in 2009.

Community Impact

1100 students have participated in our LEGO camps and outreach programs.

52000 people have attended our presentations and robot demonstrations.

Government Impact

Senator Kirk Watson sponsored a proclamation praising our hard work to promote engineering.

U.S. Senators toured our facilities as an example of integrating STEM curriculum through robotics competitions.

4. Innovative Methods to spread FIRST message 495

Movie Theatre Demos

The team lets children drive small robots at movie premieres, including at the premiere for WALL-E.

Maker Faire

At this Austin event, our booth and robot demonstrations share FIRST Robotics with both adults and children in the city.

Wii Partii

418 hosts this public Wii tournament and robotics carnival to let the community see the fun in engineering.

SMART Camp

Created as an introduction to FLL, members help elementary and middle school students design and build LEGO robots.

5. Strength of your partnership 493

Sponsors

Worked with National Instruments as an Alpha Team to help test the NI-cRIO, donated a previous year's robot to NI for testing purposes and present at company meetings.

FIRST Community

Mentor other FRC teams, in the process of creating Central Texas Robotics to provide support and funding to area teams, provide volunteers for Central Texas FLL Championship.

University of Texas

Organized and hosted an FLL Qualifier together, participate as an exhibitor at the UT Edison Lecture Series.

6. Team's communication methods and results 471

Community

Letters, flyers, and public calendar postings alert the Austin area to 418's activities and successes.

150 public appearances and robot demonstrations over the past 10 years for publicity, fundraising, and recruiting.

National

Student-written article about 418's robot designs was published in EE Times Magazine as part of the "Extreme Design" Series, receiving worldwide coverage.

Newspaper articles, team website, and other media feature the team's activities.

7. Other matters of interest 500

300 students over the past 10 years with 47 current members.

Purple Haze's female participation has risen from 10% to 33% as well as increased minority participation.

Established LASA Robotics Association 501(c) 3 organization to support the team's activities.

Participates in FIRST, BEST, and TCEA.

Official sponsors of Central Texas FLL and Qualifier host.

LASA Robotics students, as well as team members, are close friends who organize bonding activities like paintball, game day, and LAN parties.