# FRC Chairman's Long Essay Submission

It happens every year. We screw the final bolts, finish the last system checks, and bag our robot with the number 599. The gratifying sound of the zip tie concludes six weeks of build season. And we put those countless hours of blood, sweat, and tears to the test as we enter the pits with the 2013 Radiologist ready to compete. As our programmer shouts, "Enabling Robot!" to signal the final system check, the entire team walks to the stands in anticipation and hopes that we've remembered to fill the pneumatics system with air. Often those doubts are quickly quelled by the sight of our autonomous scoring bonus goals, of the drive system successfully shifting gears, or even just of our robot having just moved. But on the other hand, sometimes those weeks of designing, fabricating, programming and driving seem shadowed by the occasionally broken drive chain or mini-robot with "magic smoke" that leaves us wondering if we will even move in the next match. While we've won our share of trophies, like those for Gracious Professionalism and Tournament Finalists at the 2013 FIRST Robotics Los Angeles Regional, to say we "won'' does not begin to encompass the amount of perseverance and dedication that each of us gives even on Saturdays during build season. In 25 trips, we have never won a Robotics Competition.…but every year, we've won something much more important. Besides engineering outstanding robots, we engineer outstanding people. To "win" means more to us than the trophy at the end of the competition. What we "win" is the responsibility and initiative to thrive not only as engineers and independent thinkers but to meaningfully improve our society and ourselves.

The impact of the team begins with its impact on its members, and we make sure that all members, veterans or rookies, can explore and choose how they contribute. And often they contribute skills with which the Robodox may not already have much experience. Most noticeably, the great number of students working with CAD this season has changed how we approach the limited six weeks. In the past, we've built consistently competitive robots by measuring with calipers and drawing designs manually. Since 2011, when our mentor Alex designed the Chiropractor using Solidworks CAD, rookies and veterans have worked together to make it an integral and efficient part of the build process. Though we started CAD with only one mentor, one veteran, and one rookie, our CAD "core" now includes a team of experienced veterans, quick-learning rookies, and multiple mentors. Besides, the full models of our 2012 Radiologist and 2013 Medic, we've successfully "CADded" our newest robot, "Annie". Though CAD was not a skill with which the team had much experience, we've raised it to be a common, yet important skill to the Robodox. Though CAD was an unorthodox skill, we are an unorthodox team. We are not told or taught what we must do, but rather we find our interests and make them real with our efforts. And in those efforts, we surprise ourselves by learning to take the initiative and to step outside our comfort zones.

Leadership and equality are not easily defined, yet our team demonstrates both qualities. The well-being of the team is not the responsibility of our coaches, but also the students. We win every year by creating confident, responsible leaders in ourselves. Our annually elected student body runs the team. Every one of these "executives" is given incredible opportunities to step up and do more. In our Executive system, two students are responsible for one of six areas: public relations, treasury, events coordination, community outreach, machine fabrication, and presidency. Together, they handle a $40,000 budget; the tournament, organizes food, travel, and lodging—both expenses and acquirement—for over 50 people; they reach out to the community around us as well as those abroad; they spread Robotics by funding and planning trips to schools nearby and inviting teams to come to us so that we may help them. A, a student"campaign" for an Executive role By learning to do so without our mentors or our parents, the executives become independent, and find for themselves that they are can do more than they thought possible; and each time, they grow into more capable people, into those better qualified than before.

Such an opportunity to lead and grow isn't present only to these executives but to all of its members. The Robodox's unorthodox method of teaching its new members—the "rookies"—comes from our mission to create an environment of independent learning. For one, it's not a class where a teacher tells us what to do. Rather, we are to find what we want to do, we are to actively seek out help and continuously learn by taking the initiative to find it and while at first, the new members are shocked and confused, these teaching styles do more than let the members find for themselves what it is they love to do. But finding their specialty or their passion is not just about finding a field of study, it's about finding in ourselves the confidence to break out of our shells. By forcing us to seek out our education, we develop a deeper appreciation for what we do learn as well as mold us into those who do actively seek out our learning in other areas of life. By creating an environment where only those willing to take the initiative to learn, we have fostered young men and women to lead in their field by moving beyond what is expected of them.

But all that would be for nothing if we did not do anything with it. For years, whenever the dozens of teams came to compete, the Pit was chaos: absolute, total, blanket chaos. As many rookie teams uncrated half-finished robots, all unprepared for inspection though were ubiquitous, the sounds from above removed all ability to think. "ATTENTION," it belched periodically, "Team XYZ needs a wrench." However, every message was received with the same care: none. The few that helped quickly ran dry. It was a logistical nightmare for any team wanting, and needing, help; but the system had enough inertia to remain unchanged, until 2003. To stop the flood of announcements and requests, the Robodox took the lead and created a dike, the Robot FIRST Aid Station (RFAS); and very quickly, the Pit announcements were limited to simple queuing calls. The Robot FIRST-Aid Station was to act as a conduit, a simpler way to request tools. They would come to us, instead of the Pit Administration. They would drop off a part to be

machined and we would deliver. They would ask for system help and we would gladly give our time. And the most important thing: we made sure every team passed inspection. From start to finish, we stayed with any struggling teams. Regardless of our robot's status, we always made sure that every other team's robot was up and running.

We win when we do more for our home. Locally, we began to volunteer our time toward Balboa Magnet, a middle school in our community. Every week, we make the trip to Balboa Magnet and do for them what our mentors do for us teach opportunities. With our guidance and their impetus, a new team was started; its members have learned a tremendous amount and can do so much without us now, from programming to design—and all the critical thinking that goes along with it— to an actual building. However, while such a new team is an amazing success, we did more than create a group. With a team of students who, although they love the idea of robots, have never built one, we began a unified body that fosters the same ideas that we too work by perseverance and enterprise. We inspired a group of kids who were at first hesitant to begin robotics to love science. We helped foster a group to grow into more than just kids who can make robots; we helped foster a new culture, a new culture of engineers, scientists, and mathematicians.

We've spread our message to more than our community but also to those that we have never visited before. Several years ago, we won much more than the satisfaction of a good robot; we gave another the satisfaction of a new world. several of our members flew to South Korea to help many teams get off the ground. At a summer camp designed to teach its campers the fundamentals of robotics, we taught from our own experiences and our expertise. The results were phenomenal. In three short weeks, each camper was able to either build or program; and within that time, they'd built enough robots for us to hold a competition. Our effect on the culture abroad wasn't limited to several kids wanting to join Robotics. We gave the foundation for a few that they may create teams all over the country.

Through our efforts in Balboa and South Korea, not only did we create a celebration of all things math and science, but we also created new people in those we taught and in ourselves. We saw for ourselves that Robotics is not a limited field, not one filled with trivial games. We won a new understanding of what it is we do and a new satisfaction in doing it.

We win by taking new roads and moving forward, always finding new ways for ourselves to flourish. Although marine terrain is not something we've dealt with before, we took on the new challenge with our initiative and joined the Algalita Marine Institute. For the first time, Robodox took part in a Los Angeles-based ecological organization to raise awareness of plastic contamination in coastal waters. Inspired by our mentor Chris Siegert's efforts to reduce the use of plastic-based materials, we applied our engineering experience to designing and building an underwater vehicle that could image ocean contamination levels to 100 feet. Select students began avethe arduous journey with longer hours and harder days. The team's foray into Algalita, with the many failures that accompanied it, showed even to us who we are: innovative and

adventurous. Algalita allowed us to apply our skills beyond a game and aim for a real, more practical cause to better the world inspiring and seeking solutions to make all our lives better.; we saw a chance to change our world, however small our contribution may be…and we took it as quickly as we could.

It happens every year. Every year, we strive to do more and give more than ever before. Every year is filled with countless hours of volunteering, building, and sharing our passion. Every year, this game of competitive robotics eagerly begins full of hope and knowing that we'll win. Maybe not a trophy, but something much more important: a growth, an evolution into something more than what we are at that moment. We're "Building a Brighter Future;" not with robots or gadgets, but with new engineers, and scientists who will be with new leaders, and new people.