694 ENTERS ITS SIXTH COLLOSIAL YEAR!

STUY!

AUGUST 2006

JOSHUA IS BORN!

Making the Robot Part VI

694 Goes Beyond FRC

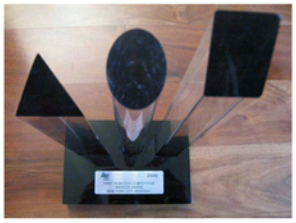
www.stuypulse.com

See Inside!

Stuypulse an NYC Finalist Again!

This year we won a record of three amazing awards at the New York City regional:

2006 NYC Regional Xerox Creativity
2006 NYC Regional Website Award
2006 NYC Regional Finalist



Inside This Issue...

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Robotics Team Advisor Rafael Colón
Coordinator. of Technology Education
James Lonardo
Research Dept. Member, Team Advisor
Anne de Sostoa Manwell
Asst. Principle Music, Fine Arts, and Technology
Raymond Wheeler

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694 Extends Beyond FRC Part I: FIRST Lego League

For many years team 694 has donated mentors to nearby FLL teams, encouraging many junior high schools to join in on this spectacular program. Upon realizing that we could do so much more for the world of Legos, we decided to take our involvement one step higher. This year we held our own FLL tournament right in our own school.

Stuyvesant referee Yon Zloof clarifies the game rules to other volunteer referees.

About a month prior to the competition, the FIRST robotics team held a series of FLL-oriented assembly meetings to fulfill three objectives: First, we had to build the tournament tables. Second, we needed to build the actual field parts out of Legos. Finally, we needed to train team members so that they could serve as competition referees.

Referees observe as students issue a command to their Lego robot.

December 4, 2005 at 7:30 A.M. was when all of our hard work finally paid off. The day went great and the kids went happily home with their awards. We could not have possibly asked for a better turnout. Many parents came up to congratulate us on how splendidly it was done for a first try.

A short time later, when the NYC FLL tournament at Riverbank State Park asked for referees to volunteer, 694 was ready to ship out volunteers as needed. The day went well and at the end we received a plaque to commemorate our efforts. At the end of this season, we find ourselves looking forward to another great year of participation in the worlds of FIRST robotics and FLL.

A student at Stuyvesant's Lego Leauge competition isnpects his robot before an important match.

We made arrangements with our principal Stanley Teitel to gain the support of the school and secure the cafeteria as the competition location. The cafeteria was perfect for us because it was spacious and had a skylight perfect for illuminating game fields, as well as plenty of outlets for teams to plug in their electronics.

Referees tally the points at the end of a match.

Coordinating large events like these is not easy! We sacrificed time after school, on weekends, and even during our Thanksgiving break in order to make sure that everything went as smoothly as possible. As we realized that the team could not handle the day-of-event security and traffic flow needs, we turned to Mr. Teitel for help. He graciously permitted ARISTA, Stuyvesant's chapter of the National Honor Society, to join our taskforce. With an extra 50 volunteers we now had enough people to cover security, relay messages, and perform other jobs in two shifts. Even our fellow FRCers from Brooklyn Tech and Staten Island Tech came to lend a helping hand.

A Stuyvesant referee volunteers at the city-wide NYC FLL tournament

Stuyvesant referees prepare for a long day of watching matches and counting scores

694 Extends Beyond FRC Part II: FIRST Vex Robotics

Last year we constructed Yvette-ette, an EduBot model of our 2005 robot, Yvette. This year the new craze is over VEX, a smaller-scale robotics design system released by Radio Shack. Co-founders and members of team 694 Nathan Keyes and Nathan Bixler formed Stuyvesant's VEX club was formed as an offshoot of the FRC team. Soon, many VEX recruits members acquired the low-cost kits and put their creative minds to work. Perhaps the most interesting independent creation was sophomore Sam Crisanto's walking robot.

However, the main highlight of the VEX year was a June competition hosted by Region 4 Robotics in Queens. The VEX club was invited to bring two robots to the competition, sending the members into a flurry of brainstorming, designing, and prototyping. After many ambitious plans were scaled down to the realm of practicality, the VEX club produced two robots which used conveyor belt systems to autonomously dump soda cans into a bucket. For their efforts, the VEX club won the competition's Programming Award.

Stylized vs. Simplified

Ian Ferguson does it again! He has designed another visually stunning image for Joshua. At the top of the image is a tornado to demonstrate Joshua's Hoover-Vac like motions. Steven Lam's simplified icon is not as abstract, and does keep to the robot's original design. All of the essential parts are depicted. Both show Joshua in all his robot glory.

Give-Aways

Last year give-aways at competitions were fortune cookies containing playful and encouraging messages from team 694. This year the team went with a more traditional give-away and ordered glow sticks. Lots and lots of glow sticks. Each four-inch stick glows in a dynamic red. The team still sports the white and blue buttons. The buttons are clean and simple; that's why everyone has them on their book bags.

BUILDING THE ROBOT
Part VI

Even during summer meetings, we were already looking at photos of robots that other teams had brought to competition and studying their drive trains. No matter what this year's challenge would be, there was no question that our robot would have to be both agile and strong to be successful. When build season began, we decided to incorporate the same design we'd used the previous year: a tank drive with 6 "wheels" around which the tread would go. The rubber's high coefficient of friction (2.0) would make us hard to push while the two middle wheels, which would be lowered slightly and acting as pivot points, would make rotating easier.

We next broke up the game into a series of goals: collect balls, store balls, and shoot balls. Our robot had a center of gravity only an inch or two from the ground, so collecting balls would be easy. We constructed a light cylindrical ramp out of thin aluminum sheet metal, lexan, and some rivets, which reached down to the ground and spiraled up towards a shooter (the spiral design consolidated the space we had for storing balls, allowing the robot to contain up to 28 at a time). Brushes mounted horizontally on our ball acquirer and vertically in the center of our spiral could move forward and backward to brush balls up from the floor to the shooter to be aimed towards top goals or back down and into bottom goals. Simultaneously, we solved the problem of collecting and shooting.

This left the shooter. We decided to mount an old pneumatic wheel we had around the lab to the spiral. This saved us weight (as opposed to using two wheels). To give the ball spin, we cut a tube out from plastic piping to compress it slightly as it came out.

The last and simplest elements of the robot were the bumpers, built to restrictions that FIRST specified. These protected our lowered drive train from too much damage when being hit on the playing field and cost us nothing in weight. (continued on page 6)

Book Submission

During kickoff, Woodie Flowers announced that Rockport Publishing would compile a book about this year's robots. Winners of any of the five engineering related awards would have thirty days to apply for a place in the book. We tucked this possibility in the corner of our minds and set about our design process. Sure enough, we won the NYC Xerox Creativity Award, qualifying us for a book submission. A writing team abandoned their spring break to compile a beautiful 25 page entry, complete with detailed diagrams and photographic documentation of the construction of our spiral and related components. Pages of articles described our thought and design processes, problems we solved through prototyping, and unexpected difficulties in construction. The book will not be published until Fall 2007, so it will be a while before we know whether or not 694's spiral was chosen.

Tom is drawing out some preliminary ideas on his handy-dandy sketchpad

Everything good needs a prototype; a purple, pink, and blue prototype. Or maybe one with a ball stuck inside.

Team members all huddle arounnd the naked drivetrain.

< Sami is testing out Josh' human loading abilities.

The team looks to see what makes Josh ticked. >

Lending a Helping Hand
(and Wrench, and Screwdriver, and....)

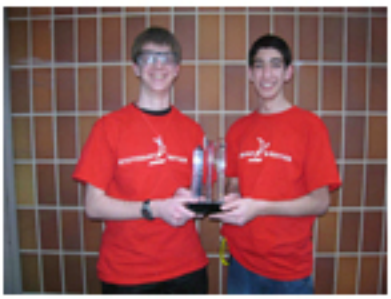
FIRST is a community where teams support other teams. The gracious help offered between competitors is an embodiment of one of the many messages FIRST sends. Team 694 upholds that message by lending a helping hand to rookie teams each year. This year we visited Team 1880, East Harlem Tech. We visited their school to provide them with information and other resources. After showing them previous year's games and the different strategies associated with each, we answered their questions and gave them helpful tips. We were especially proud to watch as they went on to win the NYC Regional just a few months later.

However, help does not stop when the competition starts. Team 711 across the pits was in dire need of help between matches due to a mechanical failure and asked for our assistance. Members rushed to 711's pit to help them through the competition, mainly with wiring issues. They learned some very nice wiring essentials that they will remember for the rest of their robotics careers. Meanwhile, we wait to compete with them again next year.

visit our new website at www.STUYPULSE.com

Ever since the 2004 year, team 694 has hosted a website. Originally used as a forum where we would have our senseless discussions such as the infamous, "Is our logo a battery or a television?" debate, stuypulse.com has turned into a wonderful resource for posting information for the general public.

After five years of team success we needed a new website, rebuilt to more accurately portray our goals. A team of people was gathered in the fall and quickly began the arduous task of redesigning. Numerous brainstorming meetings were held and ideas began to formulate; before long, a new website was born. It now holds basic information about our team (for instance, the history of our robots), a photo gallery, a calendar, and a private section only available to team members (mostly for the continuation of the infamous logo debate). With these great additions we were able to win the 2006 NYC Website Award, adding a new trophy to our growing collection.



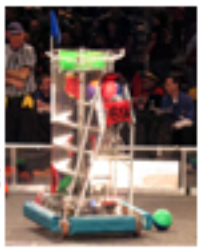
Building the Robot

(CONTINUED)

Several changes occurred once the robot was shipped out of the lab and matches began. One of the first was the switch six-wheel drive system once one of our treads snapped on the field after catching on a tensioner. We ordered omni-wheels to give us stability and easy turning like the treads would have. Our programming had to change to match the new wheels, so instead of shooting for the top goal, we now shot balls into the bottom goals to earn points in Autonomous Mode.

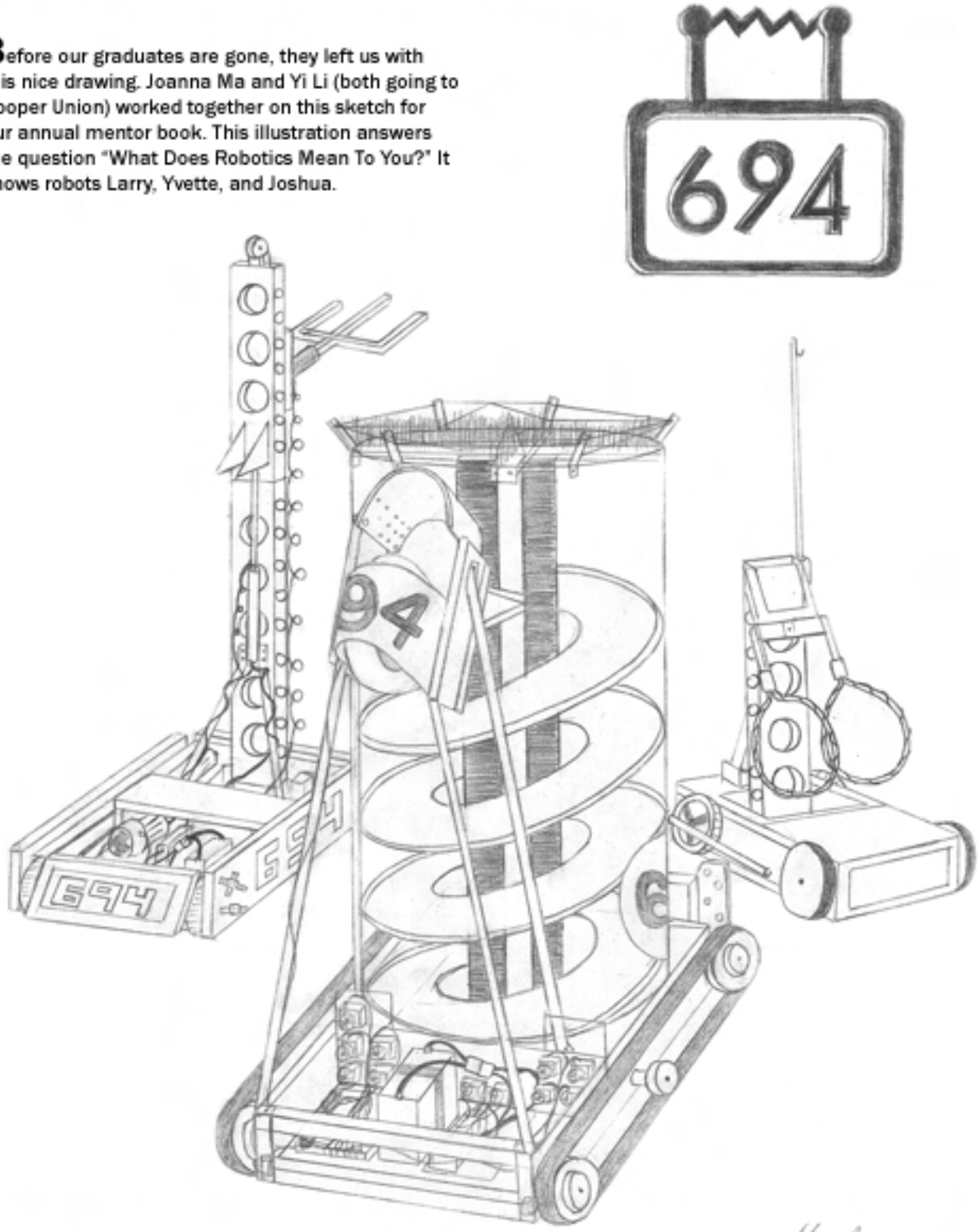
Finally, when our omni wheels also began falling apart, we repaired them by filling in the gaps.

Now, having finally put behind us a hectic year of designing, building, testing, breaking, rebuilding, rebreaking, and fixing and refixing and refixing again and again, we leave behind this season having learned many valuable lessons and planning bigger and better things for the following year.



A Gift From Our Graduates

Before our graduates are gone, they left us with this nice drawing. Joanna Ma and Yi Li (both going to Cooper Union) worked together on this sketch for our annual mentor book. This illustration answers the question "What Does Robotics Mean To You?" It shows robots Larry, Yvette, and Joshua.



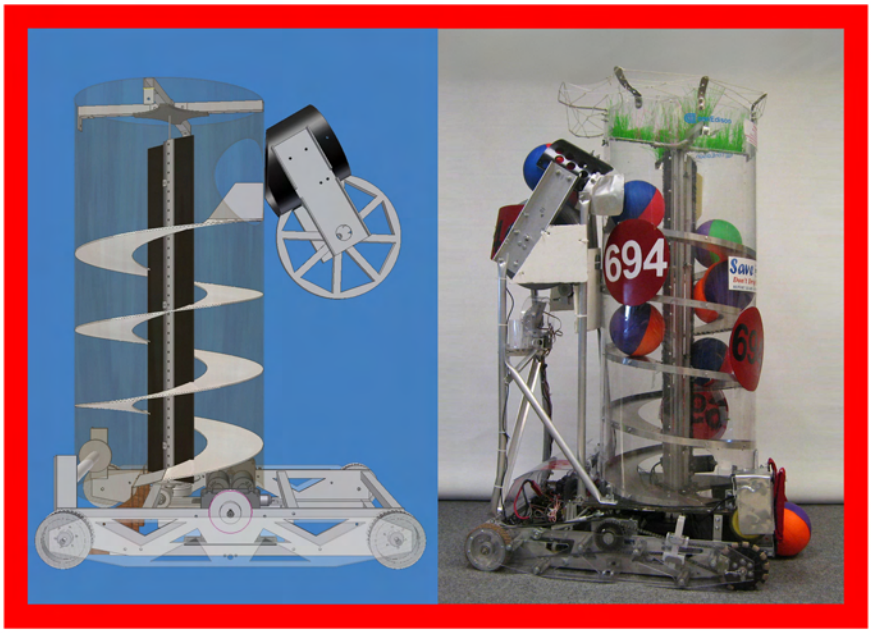
"Well, the drawing topic was 'What Robotics Means to Me?" I've been here for three years, Larry, Yvette, and Josh, so I drew those three. I would have added the other robots but I was sick that day. I missed school to draw that and it took me all day."

Yi Li, Engineering, Senior

Good-Bye Seniors!

(from left to right)
Diana Sandy – John Hopkins University
William Twomey – SUNY Geneseo
Victor Liu – Boston University
Paul Desiderio – Carnegie Mellon University
Yi Li – Cooper Union
Joanna Ma – Cooper Union
Amy Suen – Rensselaer Polytechnic Institute
Maya Zloof – John Hopkins University

From the Stuyvesant Robotics Team members to all of our sponsors, faculty advisors, mentors, and parents, a heartfelt thank you for yet another amazing year!



joshua

Stuyvesant Robotics Team 694

J.O.S.H.U.A.
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