



Concessions at Pebble Beach

By Haochuan Ni

Walking past the luxurious automobiles of the Concours d'Elegance car show was a privilege that would take \$150 out of the wallet of an automobile enthusiast. From antique to conceptual designs, the crisp grass field was lined with hundreds of these exotic vehicles.

This was the stage for the Lynbrook Robotics' annual fundraiser at this event. Providing food and refreshments to visitors of the show, the team sold close to \$8,000 dollars worth of concessions, including pretzels, churros, and Haagen Daz. With tips, the team raised a total of over \$850.

The Concours d'Elegance also attracted many celebrities. "It was pretty interesting when Arnold Schwarzenegger came to our stand to buy a pretzel," said sophomore member Reo Sato.

The labor was exhausting, but the income and free pass to the luxury car show was well worth the effort.

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Welcome to Lynbrook Robotics!

Hey Team!

I hope you all enjoyed doing math, building robots, and saving the world during your summer vacations. To make things better, there will be a major competition right here at our high school. Lynbrook Robotics is bustling with activity as we prepare to host a large event at Lynbrook called the CalGames. We are expecting over 1,500 attendees and 36 teams from as far as Idaho! Doing repairs and improvements on the robot as well as planning logistics of the event are both ways to get involved early on. Before the FIRST Robotics Competition even starts, there are plenty of activities ranging from workshops to fundraisers to competitions.



Throughout your high school career, there will be many opportunities open to you, and robotics is one of them. Everyone has the potential to learn in robotics, and much like playing an instrument, the more you practice the better you'll get. Take initiative, get involved!

Chinmay Jaju
Lynbrook Robotics Co-President 2010-2011

Welcome to the Lynbrook Robotics Team!

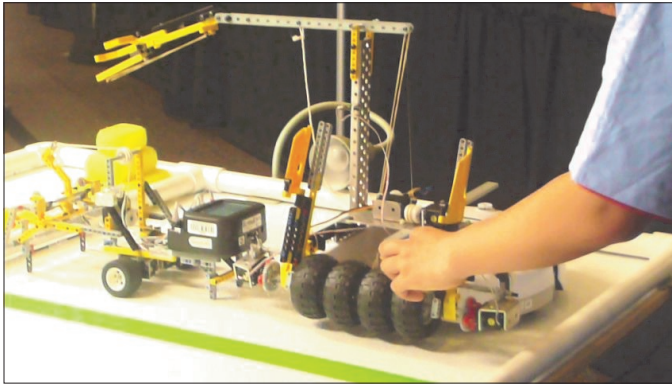
Our program is comprised of programming geniuses, mechanical techies, talented artists, creative writers and imaginative thinkers. As you can probably tell, we are a multi-faceted group that serves many different interest groups! If you stay in our program, I guarantee that you will find the aspects which interest you the most.

During the FIRST competition, we will have six full weeks packed with designing, building, programming and testing a fully functional robot. Within these weeks, I am sure that you will find your back aching and your mind in a state of complete sleep-deprivation. By the end, however,

you will have learned more than you could have possibly imagined and have made many new friends. In other words, it will have been completely worth it.

Don't be afraid to jump into activities and make the most of our program. The doors are wide open and the opportunities are waiting. Let's get down to monkey business!

Karena Cai
Lynbrook Robotics Co-President 2010-2011



LEFT: Team 170's Roomba iRobot, "Hoorah," and Lego robot, "Steph3n," was being prepared by student designer Haochuan Ni to perform a practice routine. Team 170 was one of the 16 international finalists and won a Judge's Choice award for Outstanding Engineering.

Inspiration for the Next Generation

By Alric Siu

Halfway through summer, Alric Siu and Lucy Mou of Lynbrook Robotics led the XBOTS, a First Lego League (FLL) team, in launching a free four-day mini-camp at Cupertino Library. Situated in Miller Middle School, the team contributed to the community by introducing students to robots. The camp enabled kids to use entry-level Lego Mindstorm NXT kits (such as the one pictured below) to create their own, innovative machines. Comprised of about 20 students ranging from ages 10 to 14, it aimed to foster passion in robotics and provide hands-on skills for future advancement.

The objective of the camp was simple: help students build and program a robot that transports ping pong balls into a box. Nevertheless, the results were astonishing; hardly any of the kids had ever been exposed to robotics before and yet were able to overcome the challenges in building and running the robots. The City of Cupertino was so impressed that Kris Wang, the mayor, gave an honorary proclamation to the XBOTS on August 3 celebrating their meaningful program.

In the future, the XBOTS would like to spread their passion for robotics to schools outside the district as well. They have been invited by parents from Lawson Middle and Dilworth Elementary Schools to share their experiences by setting up new FLL teams.

If you would like to view pictures of the mini-camp event and the proclamation ceremony, please visit:
www.millerxbots.com/news/



International Botball Championships

Oak Grove High School Eaglebots and Lynbrook High School Funky Monkeys take home 9th place in seeding with finalist and engineering awards.

By Haochuan Ni

EDWARDSVILLE, Illinois – In the weeks before the international Botball robotics championship event in July, Oak Grove High School's Botball robotics teams, the Eaglebots, and the Lynbrook Robotics Funky Monkeys had been huddling together in a classroom workshop, piecing together Legos, performing test runs on practice tables, and editing the robots' software. The result of hours of problem solving and hard labor was now facing tough challenge at the Botball competition as double eliminations gradually narrowed the number of competitors down to 16 finalists.

Unfortunately, the leading Eaglebot team, number 170, was knocked out in the second round of the finalist double eliminations. Team 170 ultimately earned 9th place internationally in the seeding matches and was recognized for their robots' mechanical features with an engineering award.

Building Up

Since the Oak Grove High School Eaglebots' founding in 2006, the organization has been comprised primarily of students of immigrant families. Because of the Eaglebots' financial strains and lack of experience in the robotics field, Lynbrook Robotics has played an active role in mentoring and leading the Eaglebots Teams.

The Eaglebots fielded three teams, 169, 170, and 171, to compete in this year's Botball competition. The competition challenge was to clean up a mock oil spill. The game's tabletop field, nicknamed Lake Capek, was riddled with various game pieces which had to be placed in target destinations for points. To accomplish this, students designed autonomous machines built from Roomba iRobots and Legos.

The Eaglebots members and Funky Monkey mentors were determined to increase the capabilities of their robots to face the antici-

pated opposition, despite the stellar performances of the Eaglebots' machines in the local Northern California Botball Regional Tournament in April. In addition, the game rules were tweaked to encourage teams to design new contraptions. "After the regional [competitions], the game [was] changed," said Lynbrook student mentor Brian Axelrod, "and some pieces became more accessible."

The Machines

All three teams' Roombas received significant overhauls. Team 170's machine gained Batmobile-like rollers, which gathered "dirty duck" game pieces into their target location, and was rebuilt to be lighter and structurally stronger. However, Team 171 opted to create an entirely new roller, and Team 169 decided to construct a completely different machine designed primarily to score points by placing sponge blocks, or "sorbents", onto oil slick pads.

The most significant upgrade to all of the Roombas was the addition of hair-trigger grips, claws stable enough to withstand the Roomba's rough movements, which were placed on the previously unused upper structures. These grips were specifically designed to capture the elusive high-value game piece known as Botguy. During seeding rounds, Team 170's hair trigger experienced a 100% reliability rate.

Unlike the Roomba, Team 170's Lego robot, or Legobot, was completely new. Although the original parallelogram scissor duck grabber used in the regional competition was innovative, the Eaglebots and Funky Monkeys were determined to create a Legobot that would be able to place all the clean duck game pieces on the target location for maximum points.

After studying the linkage of a pair of vice-grip locking pliers, lead designers of Team 170 decided to construct a Legobot that could

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Botball

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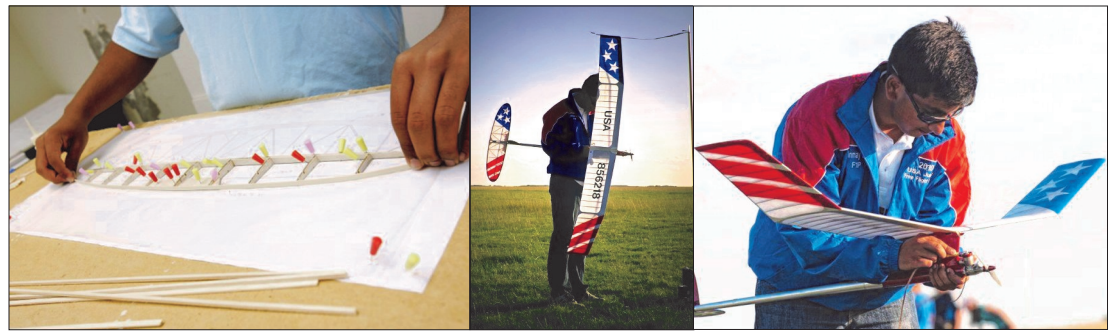
pick up clean ducks with jaws that emulated the closing action of such pliers. After countless hours of meticulous engineering, the finished product, named Steph3n, became a highly efficient machine that never failed during competition. The other two teams employed comparable systems that performed similarly. The flawless performances of Steph3n drew the attention of judges, and earned a Judge's Choice award for Outstanding Engineering for Team 170.

Successes and Failures

Not all of the ambitious designs were successful. Although Team 169's sorbent-dropping mechanism performed well under testing conditions, it was difficult using it to calibrate the motors and detection sensors. Thus, the design was scrapped in favor of a simpler plow that would remove ducks from the oil slicks for points.

Likewise, Miles Chan, a rookie member of Lynbrook Robotics Team, devised a sliding guide for Team 170's Roomba that would drop the sorbents in the oil slicks, but similar problems of calibration prevented it from being used in the competition. Communication also broke down at times between the Funky Monkeys and Eaglebots and the distribution of labor between the two groups became poorly coordinated. "Whenever you get two different communities, there are conflicts," said James Lee, student president of Team 170.

Nevertheless, this year's Botball season was an overall success. It was a learning experience for both Oak Grove students and Lynbrook mentors. "I gained both leadership and technical skills from participating in Botball," said Karena Cai. "It helped me gain insight on concepts of physics and mechanics and it also helped me learn to collaborate with others." ■



TOP: Lynbrook Robotics co-president Chinmay Jaju constructing and rehearsing.

Model Becomes Reality

A Student's Journey to the World Junior Flight Championships

By Alexander Lin

For months, Chinmay Jaju, the co-president of Lynbrook Robotics, had been toying with fiberglass airfoils in his workshop, practicing his machine's flight routine at nearby fields, and recording his observations and data. All this work was put to the test during August as Chinmay, a representative of the United States, competed in the FAI World Junior Flight Championships in Salonta, Romania.

FAI is the international governing body of the aeronautics, and responsible for recognizing international flight records. The organization also oversees airshows, flight competitions, and air sport events, including the World Junior Flight Championships.

Chinmay's division of the event, F1P, required competitors to run their aircraft's engines for 7 seconds to accelerate into a vertical climb before transitioning to a glide. The autonomous aircraft must glide for at least three minutes to achieve a perfect score for the flight.

"The hard part isn't simply getting three minutes of air time," said Chinmay. "It's being able to repeat that performance consecutively [for] 7 times."

Using his observations and analyses of the characteristics of different flight surfaces, he carefully drafted his competing design on a computer before manufacturing the aircraft using high-strength carbon fiber material. The proprietary wing and lightweight construction enabled the plane to attain higher altitude than the majority of his competitors and gave him an edge in flight time. A unique feature of his plane was the utilization of gyroscopic precession to transition the aircraft from its vertical climb to a glide by using only one control surface. This allowed the plane to perform the maneuver much more smoothly than most other models of the F1P division.

The competition involved painstaking preparation and coordination. The competing planes were carefully designed and constructed

to meet the competition requirements. Multiple considerations must be taken to ensure a perfect flight, including wind speed and updrafts, among others.

"Getting ready for all this flying is fun but it also takes up a lot of time," said Chinmay. "Sure, I love this sport, but good performance requires lots of work and commitment."

Even qualifying for the international championships required significant time and effort. Chinmay first went through an arduous qualification process last year, in which he needed to amass 75 minutes worth of flight time at regional competitions in locations such as Sacramento, Portland, and Florida. In the national competition that took place in August 2009 in Muncie, Indiana, competitors were required to fly for two consecutive days and have a cumulative score in the top three of all fliers in his or her division. After placing first and second in the pre-national and national competitions respectively, he became the first qualifier to the international competition in Romania this summer.

In the international competition, Chinmay ultimately placed third in the F1P division, and helped the United States team placed second overall. His unique aircraft design received significant attention from audiences and judges, many of whom were astounded by the plane's elegant efficiency. In his most memorable experience of the entire trip, the aircraft soared high above his competitors' airplanes and into the clouds during the first flight. The contest had to be delayed for several hours because his airplane flew out of sight.

Chinmay devoted numerous hours into this hobby. Despite his hectic practice schedule, however, he still finds time to go to a local community center and assist children with their own model airplanes. He helps them make their own airplanes, encourages them to participate in friendly competition, and hopes that they become as exhilarated by flight as he is.

Upcoming Events

CalGames 2010

— Fri.-Sat. Oct. 22-23
*Robotics Competition
at Lynbrook High School*

WRRF Robotics Workshops

— Sat. Oct. 2
Santa Clara University

San Francisco Fleet Week

— Sat.-Sun. Oct. 9-10
*Fundraising concession
sales at Marina Green, San
Francisco*

Go Outside the Boundaries

Funky Monkeys do more than plowing through school work and cutting metal. They pursue their own interests and hobbies as well.

KARTHIK VISWANATHAN, SENIOR

“I worked at Maxim Integrated Products over the summer as a software engineer, concentrating on haptics and touch screen technology. The experience I gained in robotics not only helped me in providing familiarity with the electronics, but also enabled me to collaborate effectively with my team. Although the job only lasted a few weeks, the invaluable experience gave me insight into the real-world applications of computer science, my primary interest and hobby.”

BRIAN AXELROD, SOPHOMORE

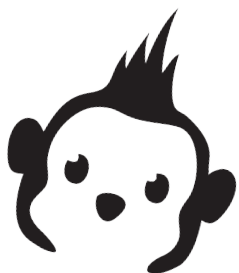
“During the summer I attended COSMOS (a rough acronym for California State School for Mathematics and Science). Studying number theory and logic (First Order Logic, Godel's work, Set theory, Infinity, etc.) at UC Santa Cruz. The professors and community were excellent and I would recommend attending COSMOS for anyone who seeks enrichment in math and/or science. I certainly enjoyed it!”

ADITYA MAJUMDAR, SENIOR

“This summer vacation, I worked at InMage, a company which specializes in software backup, disaster recovery, and application availability. The most interesting part of the experience was being able to work in a corporate environment and persuading high end software users to purchase the product, which greatly mirrored the entrepreneurial skills used in FIRST Robotics, be it computer software, or a fully functional robot. Overall, it was an excellent experience.”

MYUNG-GEUN CHI, SOPHOMORE

“I attended a summer program COSMOS at UC Irvine, a math and science camp. Sometimes I was challenged by the academics, but the experience was very memorable and fun. I was hundreds of miles away from my home, and I was able to get a taste of college life. I could talk to professors, alumni, and many experts who all helped me throughout the month. It was a great opportunity to learn, and it was definitely worth it!”



MONKEY BUSINESS

Contact us:

Lynbrook High School Robotics
“Monkey Business” Newsletter
1410 Vallejo Dr.
San Jose, CA 95130

info@LynbrookRobotics.com
www.LynbrookRobotics.com