



# MONKEY BUSINESS

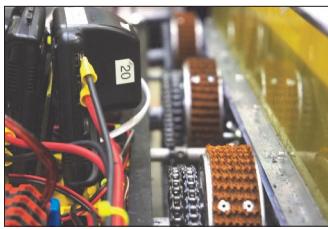
News of the Lynbrook High School Robotics "Funky Monkeys," FIRST Team #846



## Hand of the Monkey FACTOIDS

### Drive train:

8-wheel drivetrain travels up to 16 ft/sec. Center wheels are lowered for faster turning.



### Grabber:

Dual rollers grip game pieces firmly. It can manipulate the pitch of the game piece and can pick up them from the ground and from feeder slot.



### Elevator:

Three-stage elevator enables the grabber to score on any peg of the scoring grid.



### Minibot:

Minibot ascends the pole in under 2 seconds.



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## FRC 2011: From Coast to Coast

By Michelle Chang, Christina Lin, and Jocelyn Shieh

The Funky Monkeys competed in the FIRST Robotics Competition at the Chesapeake Regional in Baltimore, Maryland, and the local Silicon Valley Regional. The team took home the Engineering Inspiration Award and is qualified to attend the Championships this April.

Robots of this year's FIRST Robotics Competition (FRC) play the game of Logo Motion. In this game, teams use their robots to place inflatable tubes onto pegs high on the walls and deploy separate minibots that race up 10-foot

poles to earn bonus points.

Despite the fast-paced construction effort during the six-week build season, the Funky Monkeys' robot was still not fully completed by ship day in mid-February. As a result, the team was forced to complete the robot, named "Hand of the Monkey," at the competition. The team prepared the additional mechanical components in pre-assembled kits that could be quickly in-

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Bottom: The Funky Monkeys proudly display the Engineering Inspiration Award medals they received at the FIRST Robotics Chesapeake Regional competition.





LEFT: Vice president Karthik Viswanathan presents the three-stage elevator to the judges at the FRC Chesapeake Regional.

## FRC 2011

*Continued from page 1*

stalled upon arrival. The programmers used the FRC 2010 robot to develop software. They also created a virtual model to simulate the functionalities of the real robot for which they did not have an existing mechanical system to test.

"We spent a tremendous amount of time on this robot. We were eager to see the result of our hard work—the design, the machining, the assembly, the programming—in action," said co-president Karena Cai.

After the team installed additional hardware and fine-tuned the software and electronics, the robot was ready for the start of the qualification matches on Friday, March 18. Team 846, the only West Coast team in the Chesapeake Regional, was one of the openers of the competition, competing against Hall of Fame Team 365, MOE. During the last ten seconds, the Funky Monkeys put up a first-place minibot and won the first match of the competition.

"Our first win helped raise our confidence in our minibot, which was vital in gaining the upper hand in many matches," said co-president Chinmay Jaju.

The team was initially hampered by minimal driving experience. "It was difficult from the driving standpoint because I had never controlled the robot and didn't know what to expect," said Jaju. "The nuances of a drivetrain, and really the whole robot can only really be observed and understood after lots of practice, and that was something we had none of."

As the drivers familiarized themselves with the robot, the team's performance increased. Towards the end of the qualification matches, the drivers were able to hang a full logo from the robot and deploy its minibot easily. The team won six out of nine games and was seeded 13th out of 60 teams. They were picked to join the 8th alliance along with teams 2537 and 2912. However, the Funky Monkeys were ultimately defeated in an intense, well-played quarterfinal against the 1st alliance, consisting of teams 237, 714, and 836.

Though the team did not manage to continue to the semifinals, it was presented with the second-highest award in the regional, the Engi-

neering Inspiration Award. Several distinguishing factors enabled the team to receive the award: hosting the 2010 CalGames, assisting Miller Middle School's FIRST Lego League Team, publishing newsletters detailing its activities, and educating the community through its first-place animation.

The award qualified the team for the 2011 FRC Championships in St. Louis, Missouri and for a grant to aid with expenses of participation.

"We improved both our robot and our game-play throughout the competition, and expect to deliver a stronger performance at the Silicon Valley Regional," said team head coach Mr. David Giandomenico.

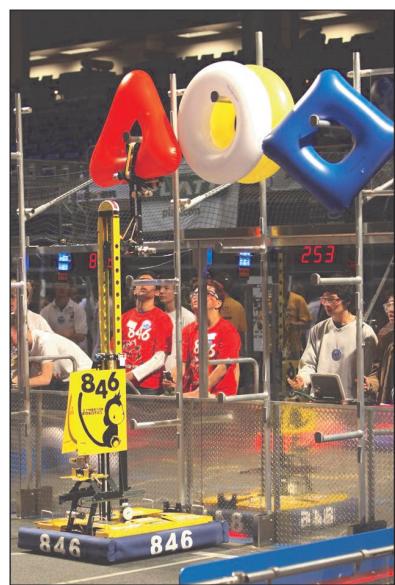
After the Chesapeake Regional, students and mentors worked furiously to address performance issues and prepare the robot for the local Silicon Valley Regional. The team produced a custom, more durable gearbox for the arm to allow for more reliable articulation, and also fielded a faster minibot.

The modifications to the robot resulted in a significantly better performance at the Silicon Valley Regional from April 1-2. The team implemented a new scoring method in which the robot quickly swings its arm down to cap the tube onto the peg. This improved the robot's scoring ability to five tubes and a minibot per match. After other teams noted the robot's improved offensive capability, the Funky Monkeys were picked by the 4th alliance for the elimination matches. After very close quarterfinal matches, team 846 and its alliance-mates, teams 670 and 1351, lost to the 5th alliance: teams 971, 1622, and 295.

"We have made significant improvements since we first entered the field in Baltimore," said Mr. Giandomenico, "With more driving practice, software improvements, and faster, more coordinated scoring processes, we hope to have a strong showing in our next matches."

The Funky Monkeys are now getting ready for the FRC Championships in St. Louis, Missouri that will take place from April 28-30.

"The game is not over," said Mr. Yang Xie, lead mechanical mentor of the team. "We know our robot has the potential. We will show our performance at the Championships."



## Rookie's Editorial

Michael Lin  
Class of 2014

I know what is cool to me. The world is slowly evolving into one that is controlled by technology and by joining this team I have learned more than I could have dreamed of, made awesome friends, and experienced the new cool.

By joining Lynbrook Robotics in their quest to make a robot in six weeks, I was set in an environment where I learned an endless amount of engineering. When I first joined this club I knew nothing about robotics; the only thing I knew was the names of the *Transformers* robots. Even so, I was excited at the prospect of building a new, fully functional robot in only six weeks.

"When you see someone who does something and they are passionate about it; it is cool." – Amir Abo-Shaeer. During the grueling six weeks that our team was given to make a robot, I saw people who loved doing what they do; they loved waking up early to work on our robot until late at night, only to wake up again the next day to do it again. These people were passionate about what they worked on, and this really motivated me. Yes, the robot we made this year is awesome, some may say epic. But if one looks closely through the six weeks it took to make the robot, the goal was not for our team to make the best robot—it was for team 846 to get together and work on something that we all are passionate about; engineering and technology. I made at least eighty new friends-- those who were both older and who I never knew. To me the robot is just a way that our team shows how much we love science, technology, and engineering.

## BUILD SEASON

WHAT IT TAKES TO MAKE  
THE HAND OF THE MONKEY

By Irene Hong

It was 11:00 PM on a typical day of build season, and the Funky Monkeys were busy in my family's garage filing, assembling, and programming different parts of their robot, the Hand of the Monkey. Build season was in full gear and mentors and students were giving their all to make the Hand of the Monkey run smoothly.

Starting from January 8, the team had six weeks to design, construct, program, and test the Hand of the Monkey. The team designed the robot using the 3D computer aided design software Autodesk Inventor. After the design was finished, parts of the robot were produced at the machine shop of Lux Manufacturing and assembled in my family's garage. Once the electronics were installed onto the machine, programmers kicked into high gear to make the robot functional.

"We labored with our mentors in these late night hours," commented freshman Miles Chan, "Afterwards, during competitions, I was able to sit back and marvel at the robot that materialized from all that effort."

The commitment and effort that build season demands makes it one of the most memorable activities of the team.

"Build season is amazing, hectic, fun, challenging, rewarding, and fulfilling all at once," said treasurer Alex Lin. "[I now have] a new appreciation for engineering and the ingenuity many students and mentors have."



## Upcoming Events

### FRC 2011 Championships

— Thurs.-Sat. Apr. 28-30

*Edward Jones Dome,  
St. Louis, MO*

### Senior Graduation

— Thurs. June. 9

*Lynbrook High School*

## Lynbrook High School

**Red, White, and Blue** Awards recognize students who teachers believe have shown exceptional performance with their classwork and with their peers. Lynbrook Robotics would like to congratulate the following Funky Monkey recipients:

**AKSHARA BALACHANDRA**  
Algebra 2/Trigonometry

**ZACK BIRNBAUM**  
AP Physics C: Mechanics

**MICHELLE CHANG**  
Japanese lvl. 3

**IRENE HONG**  
AP Spanish Language and Culture

**CHINMAY JAJU**  
AP English Literature and Composition

**ARIEL LEE**  
Spanish lvl. 1

## Fresh Members, Fresh Minds

### Freshmen on robotics

#### MILES CHAN

I had a great time during build season. It was exhausting, but well worth it. I took responsibility for organizing minibot prototyping sessions in which the members present built various prototypes of what the minibot should end up looking like. Although we often fooled around, we were able to demonstrate the feasibility of a minibot design that uses a magnet to stay on the pole. Afterwards, the older officers turned their guns on the problem and I was able to marvel at the speed at which a final design was created, built, and tested. I hope that I will be able to perform at that level for the team.

#### MICHAEL CHANG

I learned a lot joining Lynbrook Robotics, not only mechanical concepts of the robot, but all the math that went into making sure the robot worked. I was taught an impromptu crash course in physics, and how it applied to our robot during the game. Robotics isn't only about work all the time though. We had socials where we got to know everyone better. Going to the regionals is another great experience. I had originally thought that the competitions would be quiet and secluded, but as it turns out, they were very loud public events.

#### VINCENT YAO

This year, I joined the Lynbrook Robotics Team because I wanted to find out how a group of high school students would be able to build a functioning robot in just 6 weeks. After nearly a year of attending lessons, build meetings, and events, I learned much more than just the hardware and software of a robot. I learned first-hand that teamwork is an essential part of succeeding in a project of this magnitude (and also for nearly everything else in life). I was able to help design the robot and assemble the parts. I also had the privilege of creating videos about our robot. In just a single year of participating in LRT, I learned many skills in various subjects, not just the physics and hardware of robotics.

#### ERIC YEH

I have seen plenty of sophisticated machines in the media, but I never had the opportunity to see what one is truly made of. *FIRST* offered me that opportunity. Build season was tough, but it was rewarding. Throughout that time, we were scolded and criticized about our work. But the mentors and veteran members did that because they cared and wanted us to do better. They treated us as an important part of the team. From the first day of my attendance in build season, to the regionals; and from drilling my first hole, to helping to install the grabber onto the robot in the pits, the experience is worth more than any paid class. *FIRST* and the Funky Monkeys have inspired me to run towards my goal of becoming a world changing engineer.



Miles Chan assists Mr. Xie in routing the electrical wires in the elevator.



Mr. Lowd, Karena Cai, and Akshara Balachandra face off chassis parts on a mill.



Vincent Yao and Michael Chang press a pinion gear onto a motor.



Eric Yeh adjusts the trigger mechanism of the minibot.