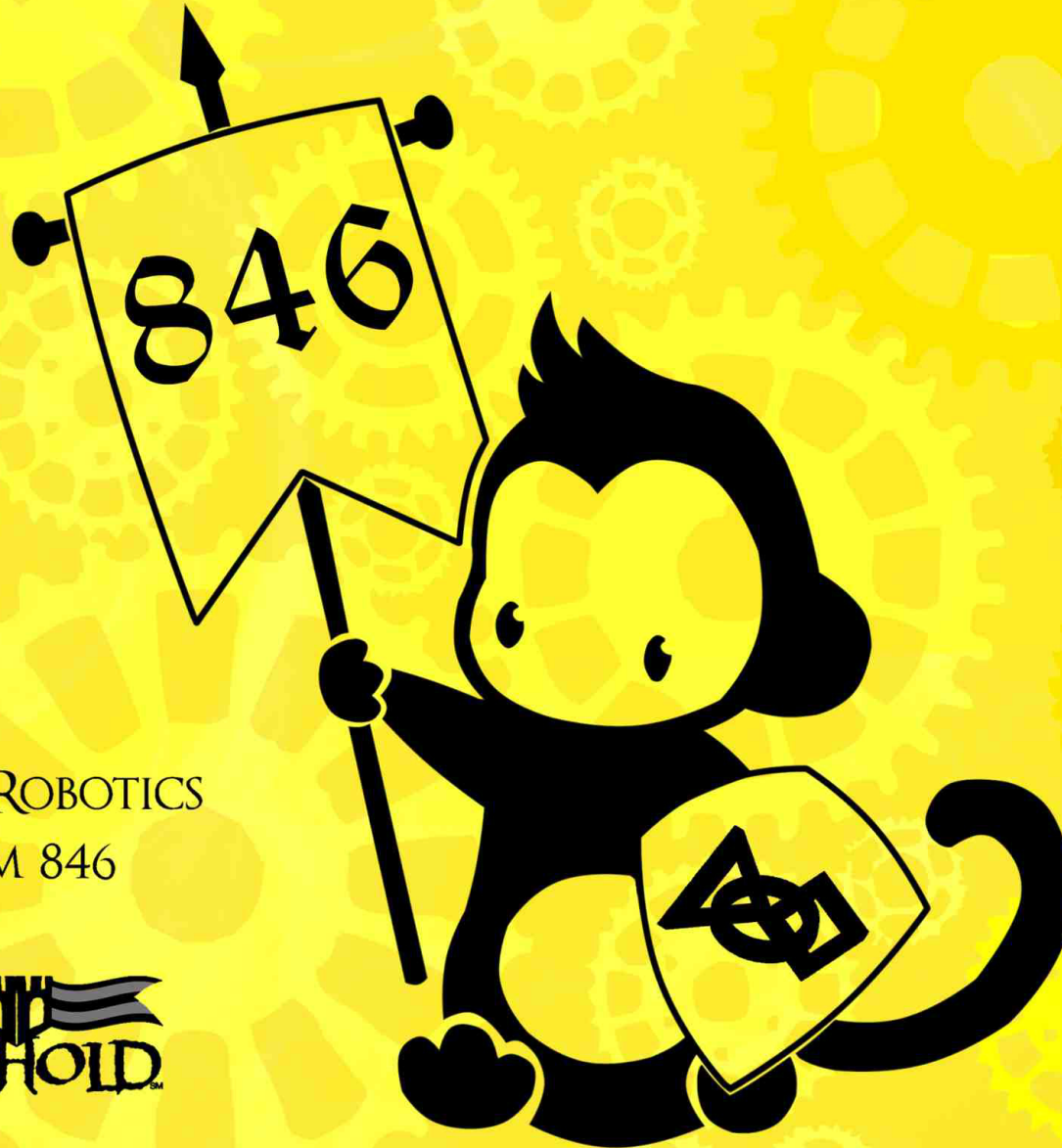


# BUILD. LEARN. INSPIRE.



LYNBROOK ROBOTICS  
*FIRST TEAM 846*

**FIRST**   
**STRONGHOLD.**



LYNBROOK HIGH SCHOOL

*FIRST TEAM 846*

---

THE  
FUNKY MONKEYS

---



# 2015 MEMBERS 2016

## MENTORS

David Giandomenico	Head Coach
Yang Xie	Mech. Design & Founder
Ralph Lowd	Mentor
Wes Harrison	Mentor
Johnathan Chai	Mentor
Andres Rodriguez	Mentor
Jake McCann	Mentor
Takumi Kawaguchi	Mentor
Gerald Haas	Team Enthusiast
Nancy Haas	Team Enthusiast
Payton Wong	Machinist
Fernando Reyes	Machinist
Milind Joshi	Software
Cindy Chan	Software
Shamali Joshi	Software
Ravi Iyer	Project Manager

## LYNBROOK ADVISERS

George Peck	Primary Team Advisor
Judy Boehm	Financial Technician
John Dwyer	Principal
Craig Tuana	Asst. Principal of Activities

## OFFICERS

Rahul Iyer	Co-President
Srinjoy Majumdar	Co-President
Owen Li	Vice President
Nikita Seth	Vice President
Shikhar Jagadeesh	Vice President of Engineering
Amrita Iyer	Co-Hardware Lead
Ria Pradeep	Co-Hardware Lead
Shadaj Laddad	Software Lead
Eric Zeng	Electrical Lead
Elton Chang	Media Lead
Yash Joshi	Treasurer
Philip Axelrod	Webmaster
Arsh Malhotra	Event Manager
Rohit Sriram	Secretary
Rohan Aren	Public Relations Officer
Alanna Zhou	Officer at Large
Andy Chun	Officer at Large
Brian Lo	Officer at Large
Jing-Chen Peng	Officer at Large
Nathan Chen	Officer at Large
Sean Chen	Officer at Large

# JUNIORS SENIORS

Amrita Iyer  
Christopher Cheung  
Eric Zeng  
Owen Li  
Nikita Seth  
Rahul Iyer  
Shawn Silverman  
Srinjoy Majumdar  
William Wang  
Yash Joshi

Anshul Kale  
Arsh Malhotra  
Brian Lo  
Devansh Goel  
Eric Chen  
Eric Fu  
Justin Won  
Kevin Chen  
Nathan Chen  
Pragna Upputuri  
Prapurna Upputuri  
Ria Pradeep  
Rohan Aren  
Rohit Sriram  
Shikhar Jagadeesh

# SOPHOMORES

Aditya Kuppuli  
Alanna Zhou  
Amber Hsu  
Andy Chun  
Anika Singh  
Arthur Zhang  
Augustin Belliard  
Aurelia Yang  
Davin Tjong  
Elton Chang  
Gautam Rajesh  
Jesse Dai  
Jing-Chen Peng  
Joshua Chin  
Katherine Li  
Matthew Zhou  
Philip Axelrod  
Rahul Khare  
Ramachandran Damodaran  
Ravi Varma  
Richard Wu  
Sean Chen  
Shadaj Laddad  
Thomas Wakuta  
Timothy Yang  
Vikranth Srivatsa  
Vincent Hwang

# FRESHMEN

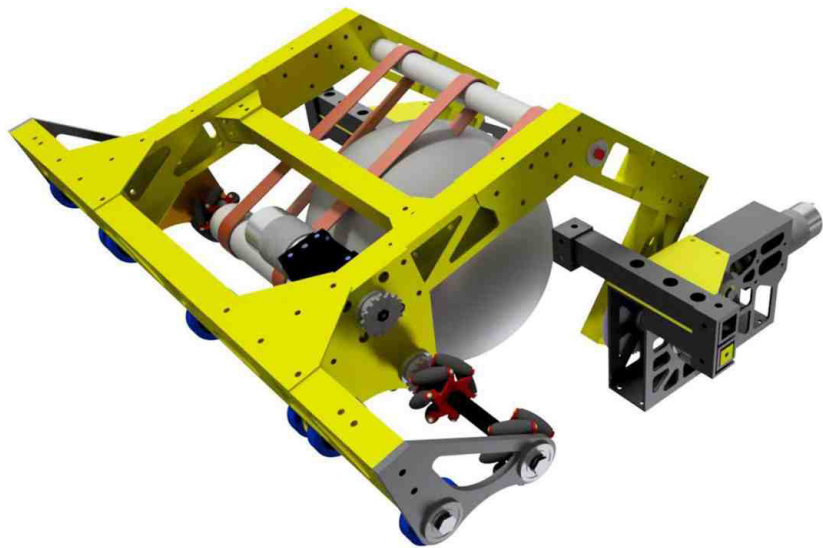
Alvin Han  
Ameya Patkar  
Amritanshu Ranjan  
Andrew Ng  
Anna Qi  
Ariel Wang  
Atul Nair  
Austin Lei  
Ben Shapiro  
Daniel Cai  
Daniel Jang  
Eesha Deepak  
James Jiao  
Jason Dong  
Jeff Liu  
Jeffrey Han  
Jodi Wong  
Justin Choi  
Kiran Manikonda  
Maithreyee Vatsan  
Michelle Lum  
Nick Chen  
Nicole Waring  
Nikash Walia  
Pranav Vasu  
Roshan Sevalia  
Ryan Sun  
Shaunak Bhandarkar  
Shreyas Mohidekar  
Shruti Ranade  
Stanley Wang  
Varun Agrawal  
Victor Last

# MONKEY PYTHON



*Width: 26 in. | Length: 47 in.*

*Height: 43 in. | Weight: 92 lbs.*

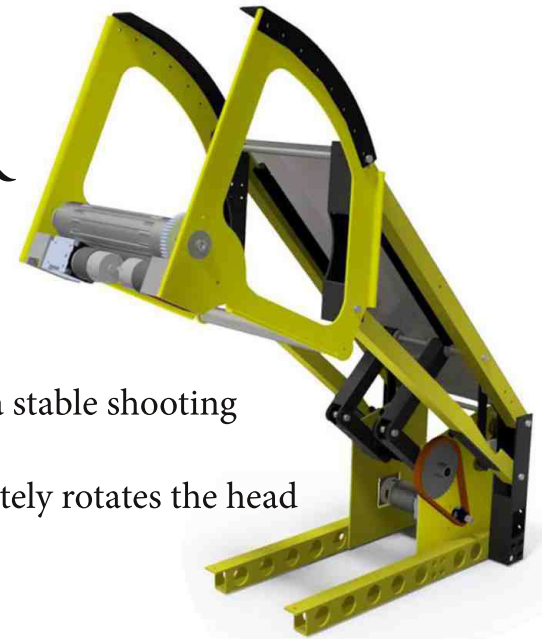


# COLLECTOR

Design Leads: Srinjoy Majumdar (*senior*),  
Andrew Ng (*freshman*) & Arthur Zhang  
(*sophomore*)

Features mecanum wheels to ensure that  
the ball goes in from all angles.

Sturdy design can both lift and depress the  
game defenses.

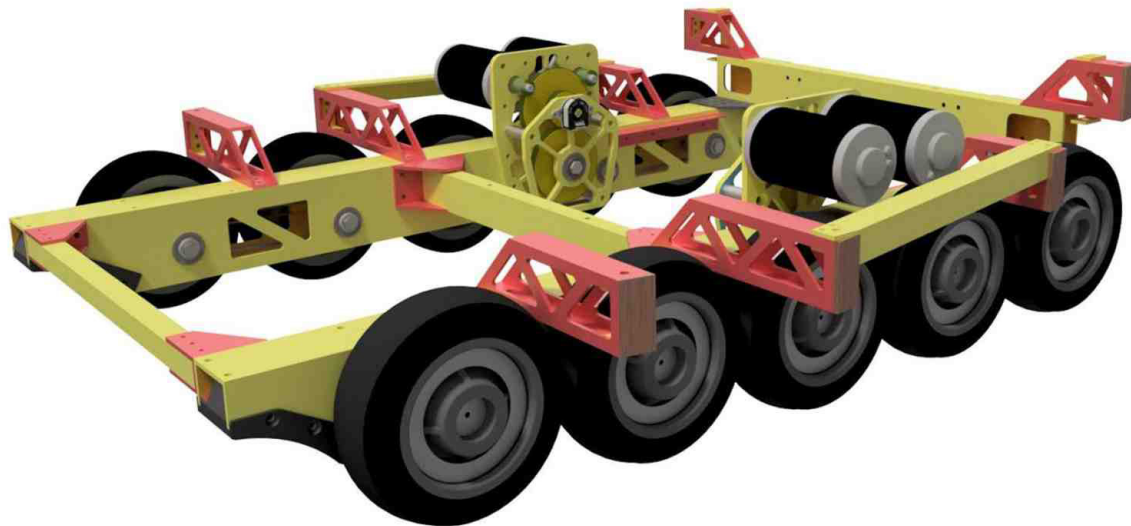


# SHOOTER

Design Leads:  
Owen Li (*senior*) &  
Jing-Chen Peng  
(*sophomore*)

Crank design provides a stable shooting  
platform.

Four-bar linkage accurately rotates the head  
to its firing position.



# DRIVETRAIN

Design Leads:  
Amrita Iyer (*senior*) & Ria Pradeep (*junior*)

Designed to handle the rough terrain of  
every defense.

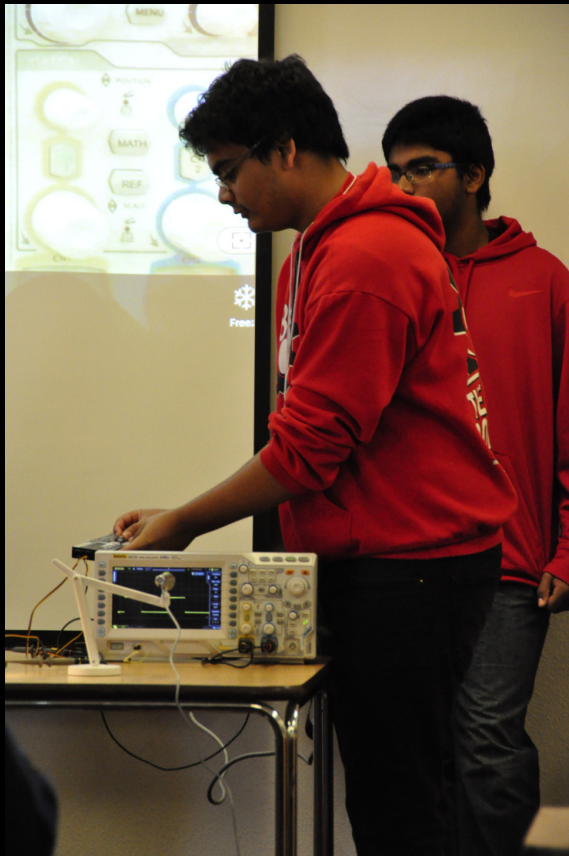
Features hexagonal bumpers to slide past  
defensive bots.



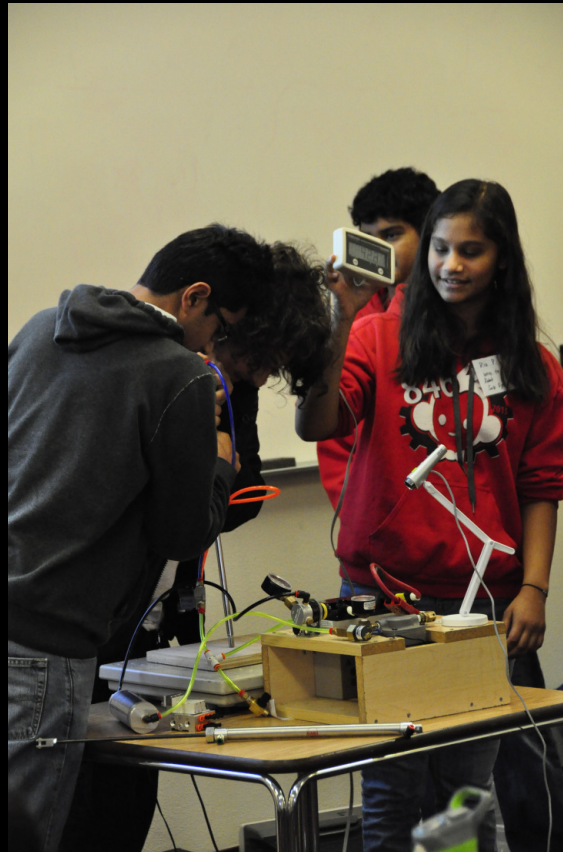
# OFF-SEASON



# WRRF WORKSHOPS

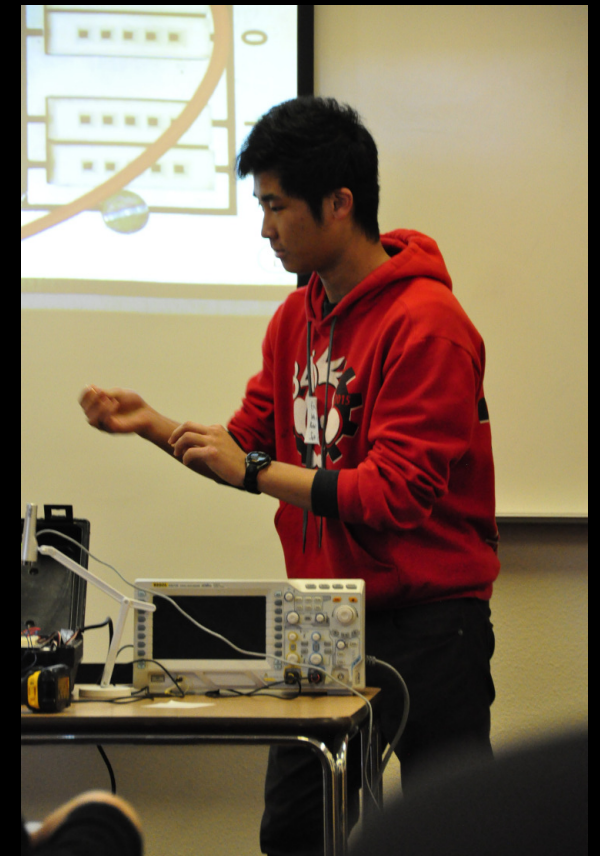


▲ Srinjoy Majumdar (*senior*) demonstrates how to use an oscilloscope to read an encoder signal.

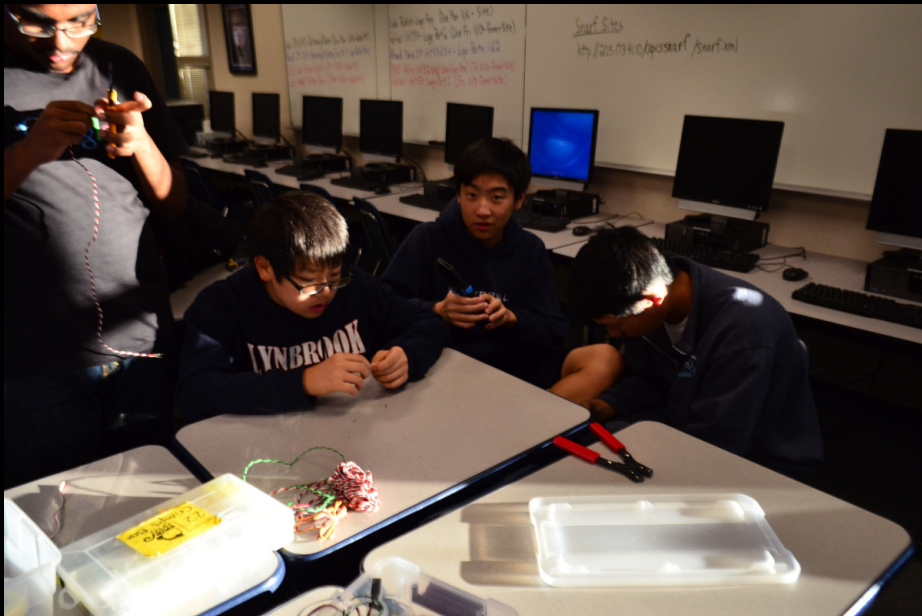


▲ Ria Pradeep (*junior*) and Rohan Aren (*junior*) exhibit how pneumatic actuators work.

Eric Zeng (*senior*) explains how the Hall effect sensor works.



# IN-SCHOOL WORKSHOPS



▲  
At an electrical workshop session, a group of rookie members practice crimping wires for the 2012 robot.

Ryan Sun (*freshman*) carefully mills out a practice part under the guidance of Payton Wong (*mentor*).

▼

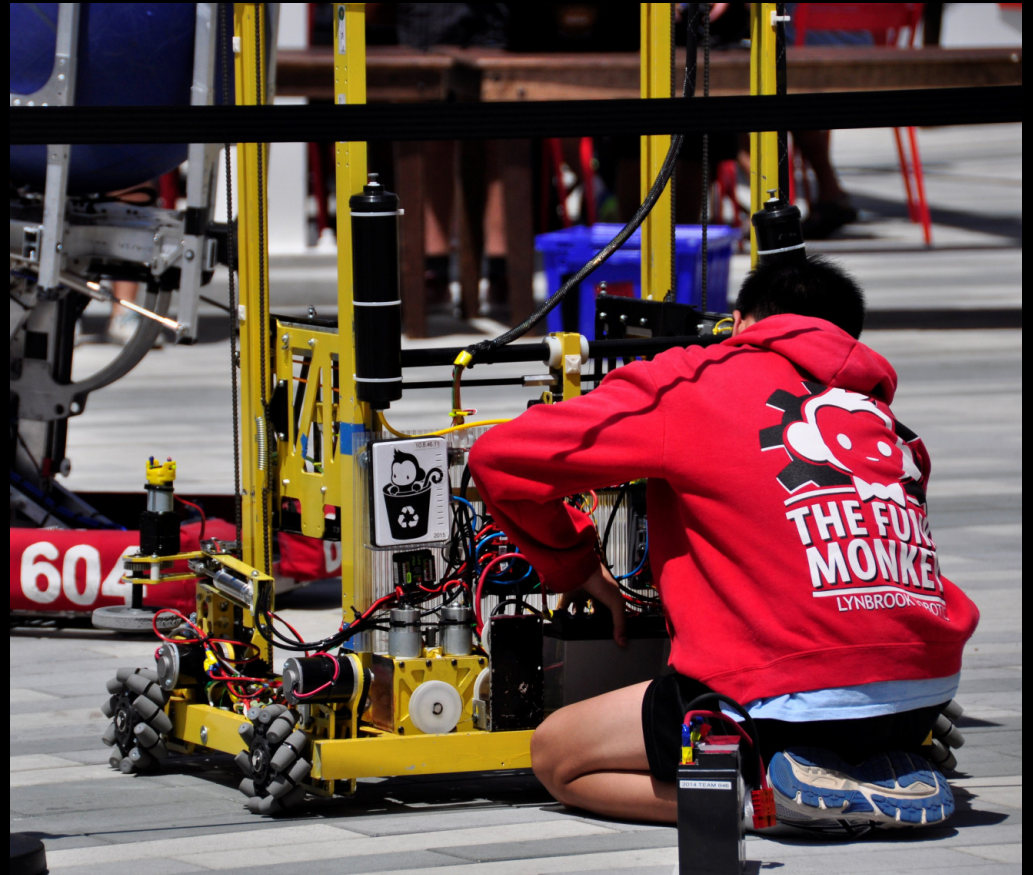


# DEMOS



◀ At Google, our 2015 robot creates a massive stack of ten totes, four higher than allowed during competition.

Jing-Chen Peng (*sophomore*) switches the battery after an exhausting run at Google.





▲ Eric Zeng (*senior*) prepares our 2014 robot, Funk Cannon for another run at Intuitive Surgical.

At a demo for children, an enthusiastic volunteer catches the ball after a shot from Funk Cannon.



# FLEET WEEK



▲ Yash Joshi (*senior*) grills sausages on an early Saturday morning to raise money for the team.

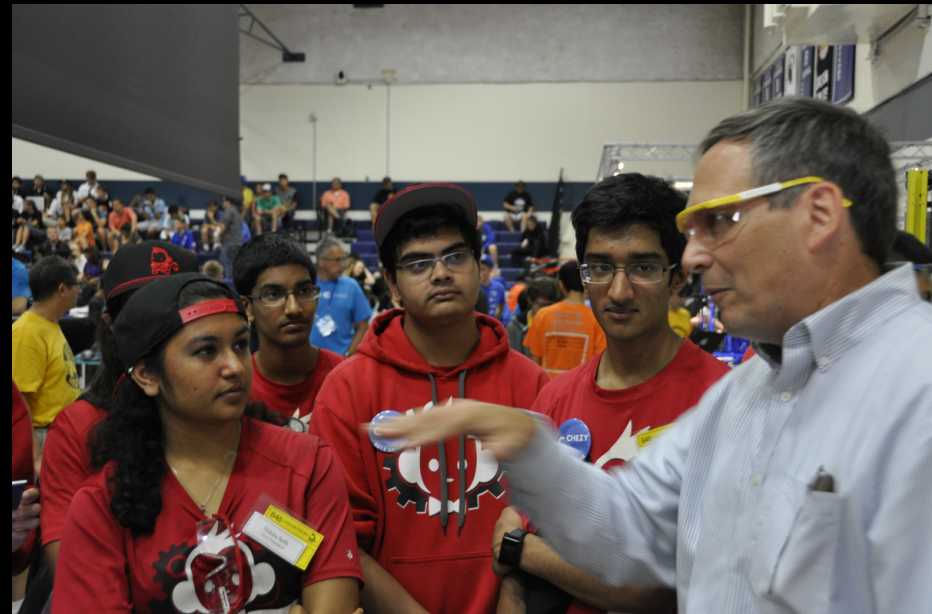
Our team celebrates after a successful day of sales at Twin Peaks, San Francisco.



# CHEZY CHAMPS



▲ Owen Li (*senior*) and Rahul Iyer (*senior*) place the robot on the field, ready for another exciting match.



▲ Vincent Wilczynski, the deputy dean of Yale School of Engineering, tells our team how every feature on our robot works for his recently published book, *Behind the Design*.

# CALGAMES



▲ Ria Pradeep (*junior*) efficiently slides a tote through the human player station.



▲ The backup drive team discusses strategy for the upcoming match with coaching alumnus, Johnathan Chai (*mentor*).



# BUILD SEASON



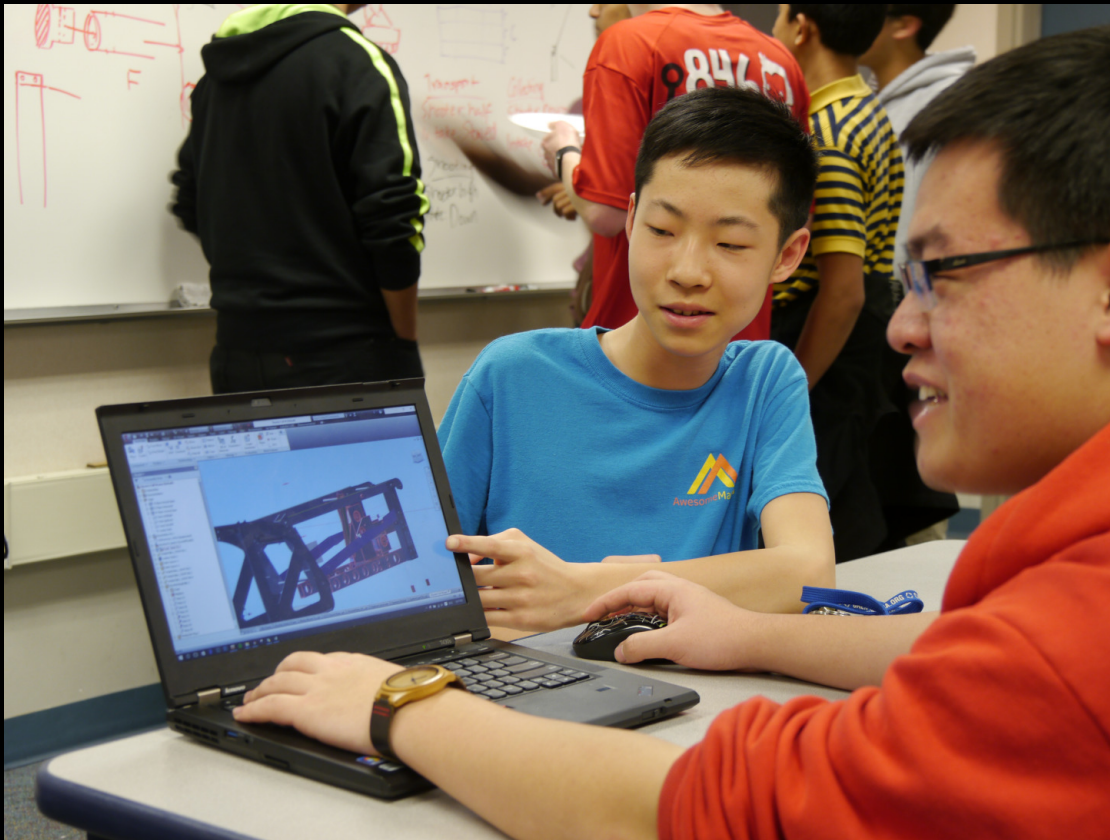
# DESIGN



▲ Yang Xie (*mentor*) shares his ideas with Rahul Iyer (*senior*) on how to open the *sally port*, the swinging door defense in this year's game.



▲ Owen Li (*senior*) explains to Yiu-On Li (*freshman*) how the shooter mechanism works.

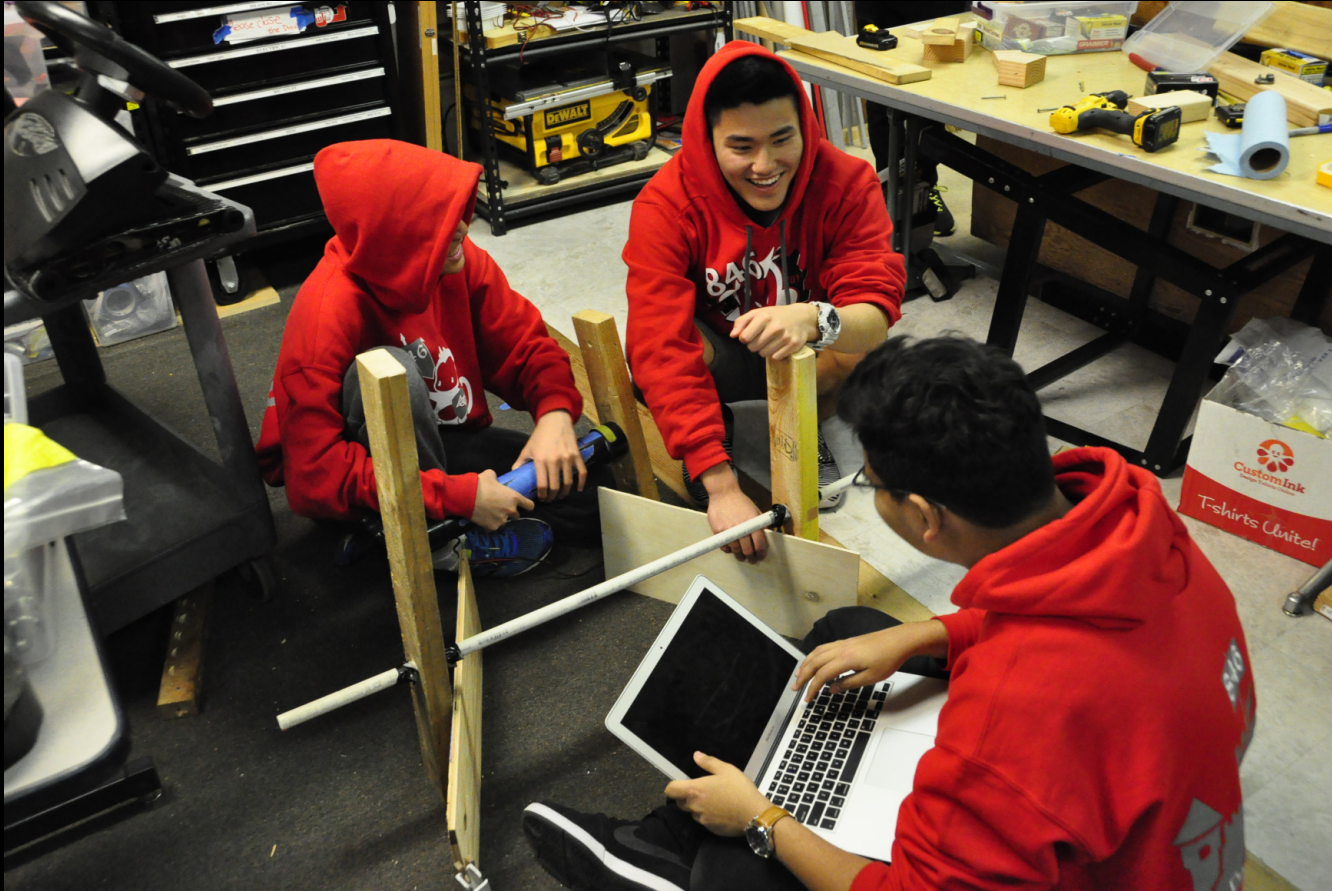


◀ Owen Li (*senior*) and James Jiao (*freshman*) discuss the geometry of the shooter.

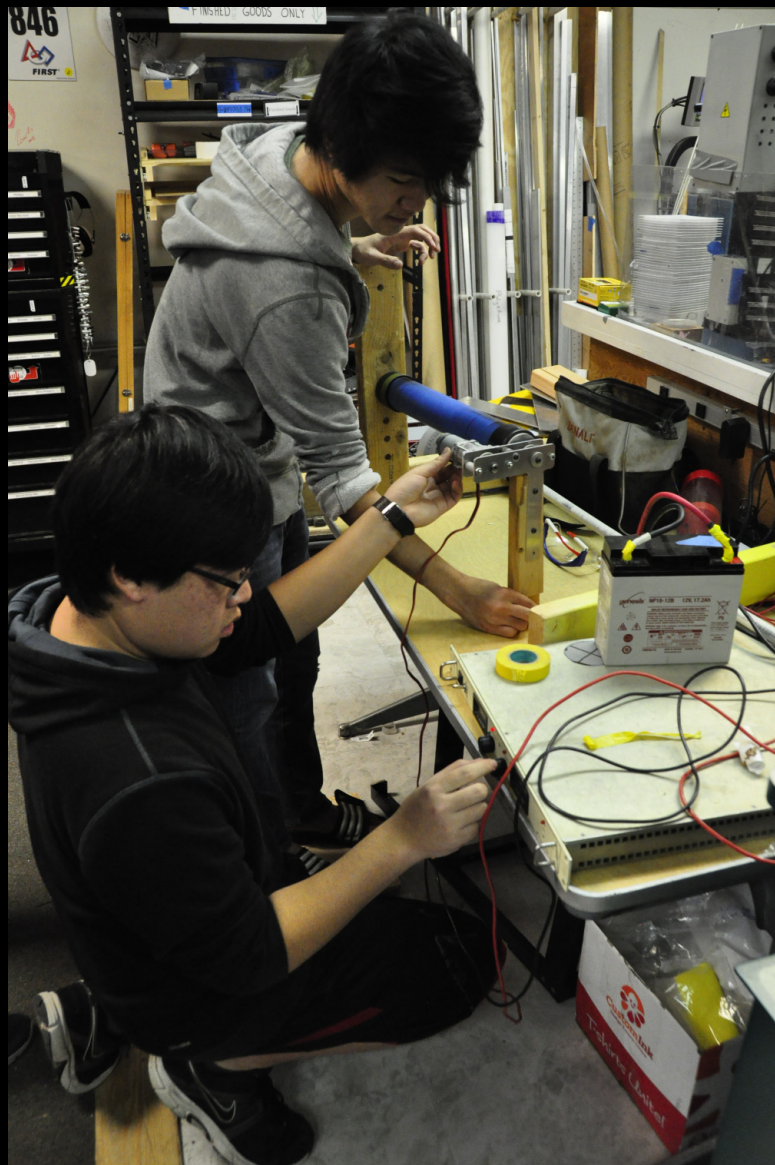
▶ The CAD model of Monkey Python was completed after over 1400 revisions by more than 25 students.



# PROTOTYPING



▲ Srinjoy Majumdar (*senior*), Arthur Zhang (*sophomore*), and Jing-Chen Peng (*sophomore*) discuss ways to prototype Monkey Python's collector.

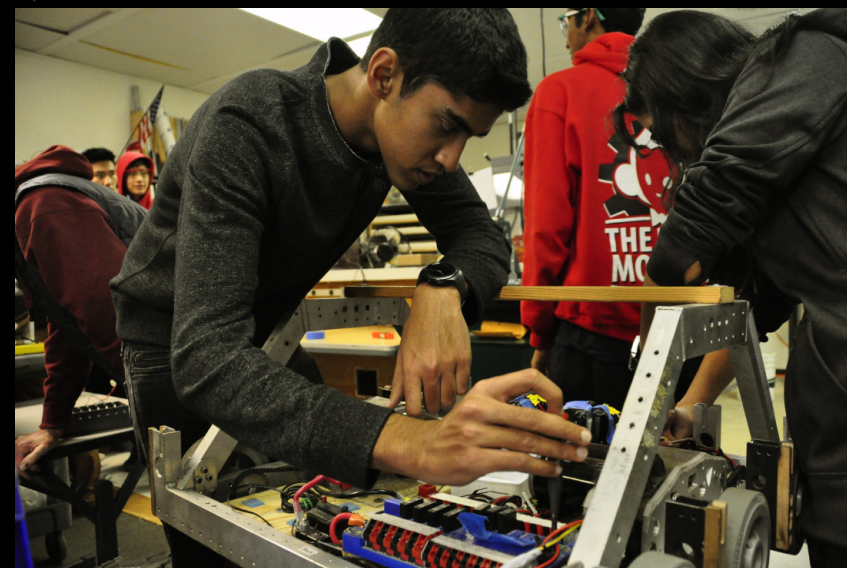


▲ Owen Li (*senior*) and Takumi Kawaguchi (*mentor*) test out a rough model of the collector's intake.



▲ Scrub Monkey, the 2016 test robot, prepares to cross the low bar defense.

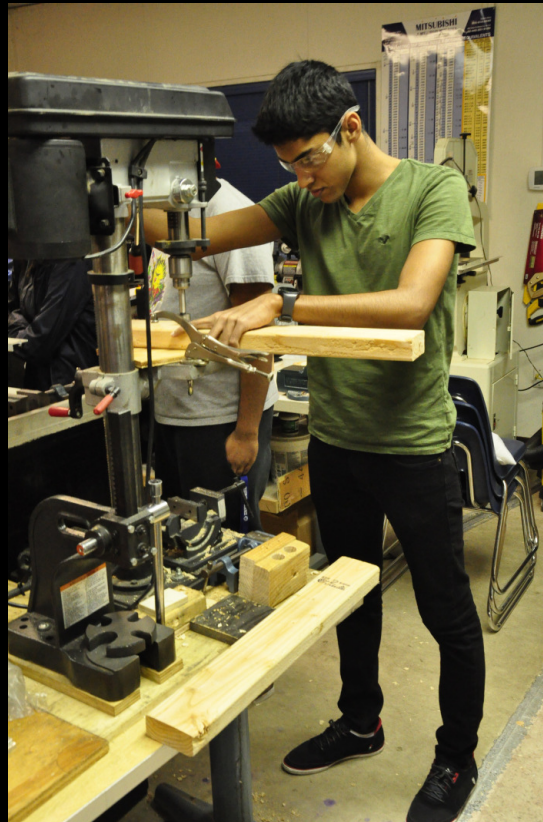
Shikhar Jagadeesh (*junior*) brings Scrub Monkey back to life.



# FABRICATION

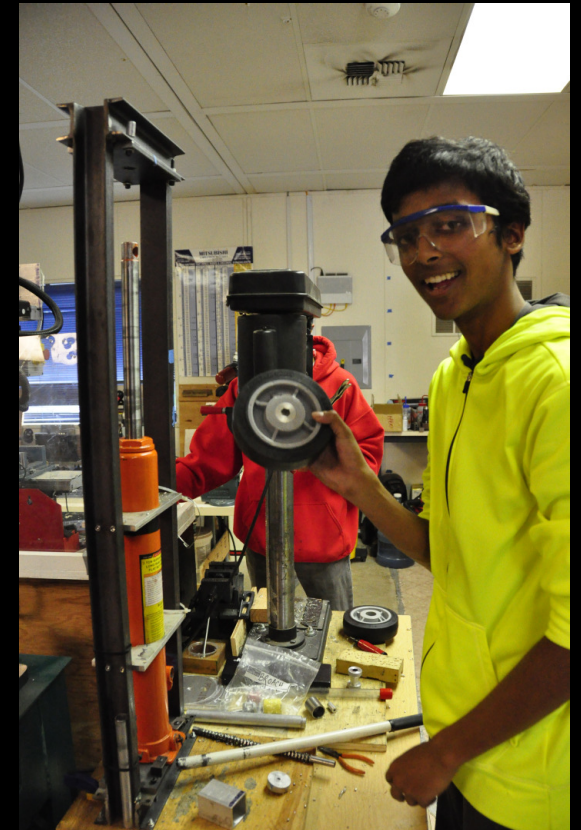


▲ Shawn Silverman (*senior*) spots Ralph Lowd (*mentor*) as he cuts some lumber for the tower.



▲ Shikhar Jagadeesh (*junior*) cleanly bores a hole for the low bar defense.

Gautam Rajesh (*sophomore*) shows off the wheel that he had just broached on our custom built hex broaching press.





▲  
David Giandomenico  
(*mentor*) makes sparks  
fly as he repairs the vice  
on our CNC mill.

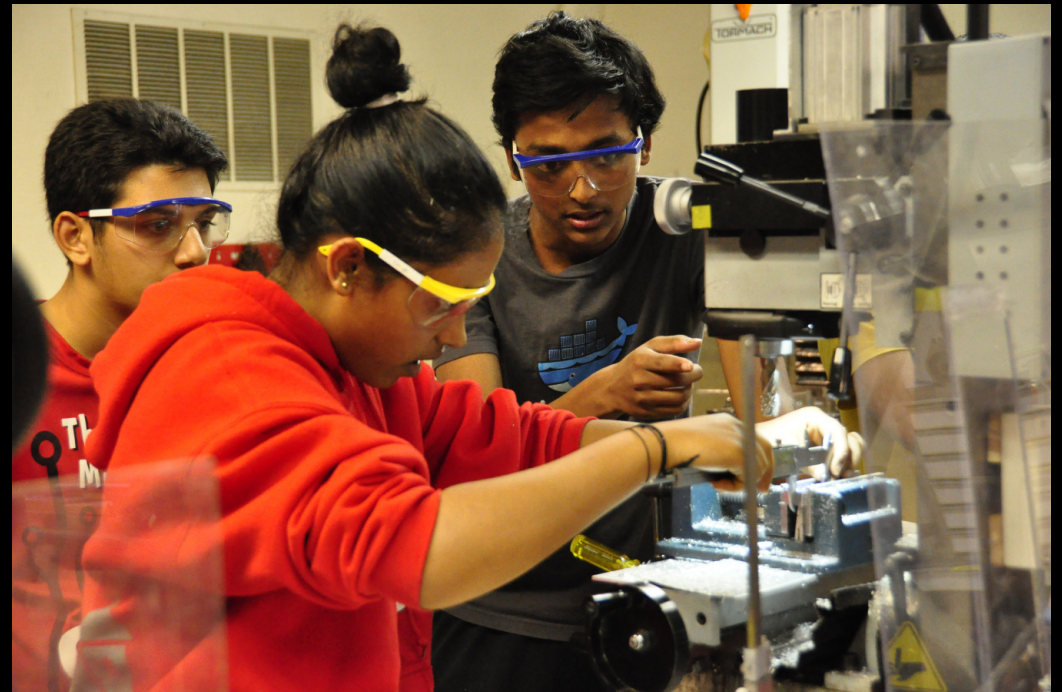
Arsh Malhotra (*junior*) and  
Shikhar Jagadeesh (*junior*)  
add a coat of primer to the  
gearbox plates.



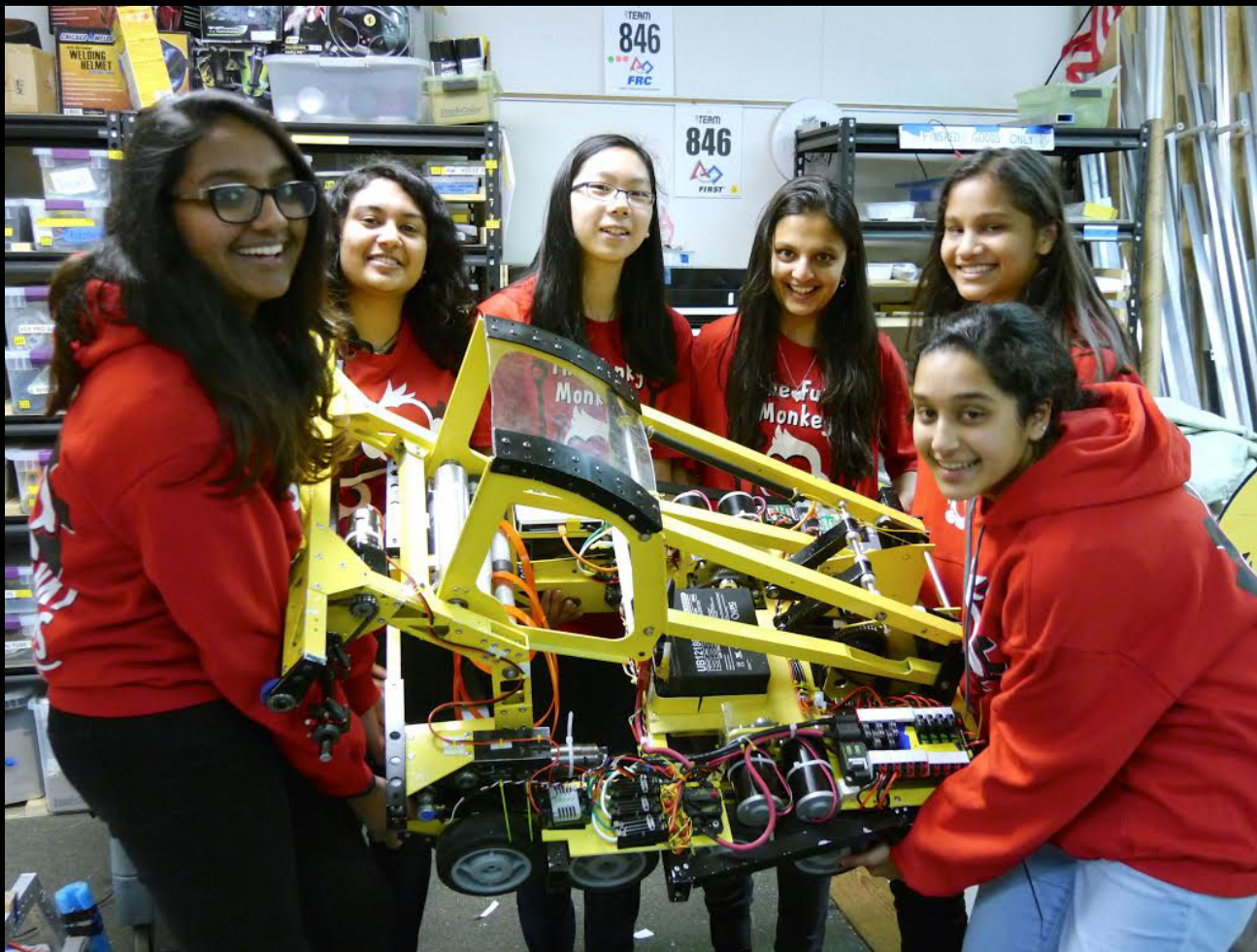


Gautam Rajesh (*sophomore*) oversees Maithreyee Vatsan (*freshman*) as she mills a part.

▲  
Amrita Iyer (*senior*) and David Giandomenico (*mentor*) struggle to figure out why the chains do not fit.



# GIRL'S SUBSYSTEM



▲ Girl's Subsystem team: (From left to right) are Amrita Iyer (*senior*), Nikita Seth (*senior*), Michelle Lum (*freshman*), Eesha Deepak (*freshman*), Ria Pradeep (*junior*), and Anika Singh (*sophomore*). Maithreyee Vatsan (*freshman*) is also on the team but not included in the photograph.



# San Jose Mercury News

## Girls on Lynbrook High's robotics team step up to a challenge

By Kristi Myllenbeck | March 23rd, 2016

Girls on the robotics team at Lynbrook High School are taking charge.

Of the nearly 100 members of Lynbrook's FIRST Robotics team, "The Funky Monkeys," only 23 are girls. Two years ago, robotics team adviser of 12 years David Giandomenico decided to challenge the girls on the team to get more involved.

"Generally [the team] had one girl and one guy as the co-presidents," he said. "In some more recent years it was going to all guys, and I was recognizing the trends where the girls were always going into administration, except for a few. And it was very hard to get [the girls] on the technical side. So I was really looking for a way to make an environment that was more inviting for the girls."

So he started the "All Girls Subsystem Challenge" with a few female team members, which allows girls on the team to band together to create an entire portion of a robot themselves.

Each year the entire team, boys and girls, constructs a robot based on a set of challenges. This year, the girls built the drivetrain, which provides support and mobility for the team's robot.

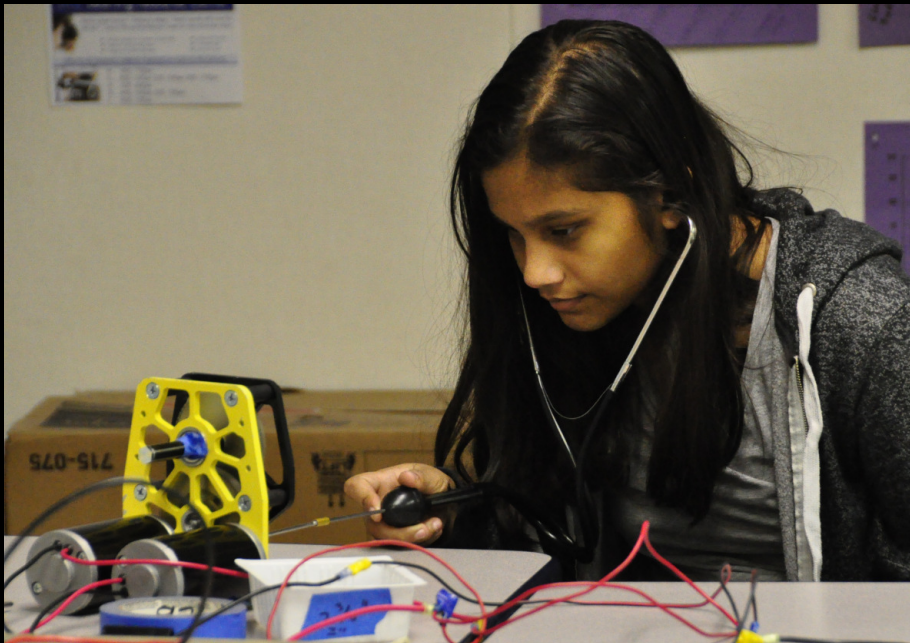
Amrita Iyer, a senior, has participated in the challenge every year since its inception.

"We worked with our mentors and created the challenge so that we could create a smaller, more comfortable environment for the girls to work in, as a group of only girls, to foster their engineering skills and perhaps even social skills," she said. "When they went outside of the girls group and worked in the rest of the team, which is co-ed, they were more comfortable showcasing their technical skills outside of the team. As a co-ed team it's good for us to foster the girls as future engineers."

Eight girls participated in the challenge this year.

Nikita Seth, also a senior, has been on the robotics team all four years and has participated in the challenge since it began her sophomore year. She said that girls in robotics don't always receive the encouragement they need.

"What we've noticed is that girls in this area are generally encouraged to go toward the life sciences, not necessarily engineering. The guys are encouraged to go into engineering but the girls aren't, and it starts at a very young age," she said. "The challenge is really to make the girls feel comfortable. There's value in learning the technical side, obviously, it's what we're here to do, but it's really to create the comfortable environment."



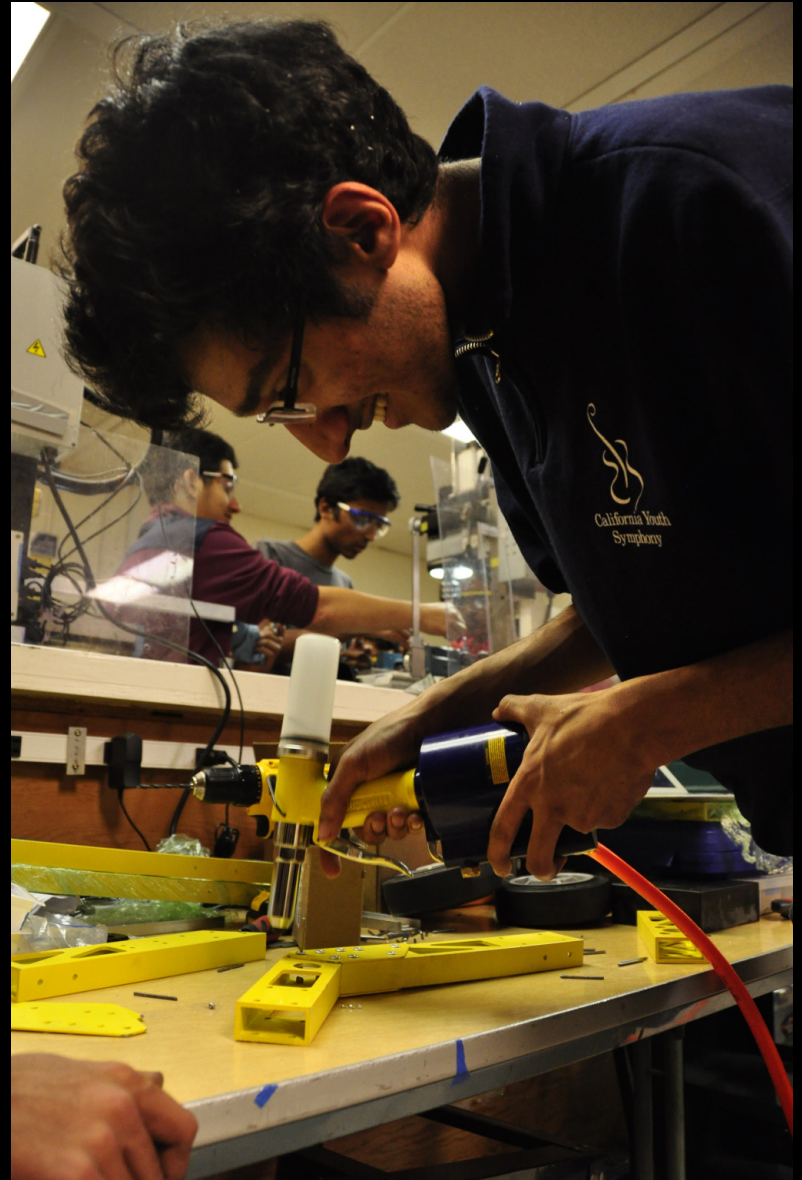
◀ Ria Pradeep checks her gearbox with a stethoscope to locate the source of an unexpected noise.



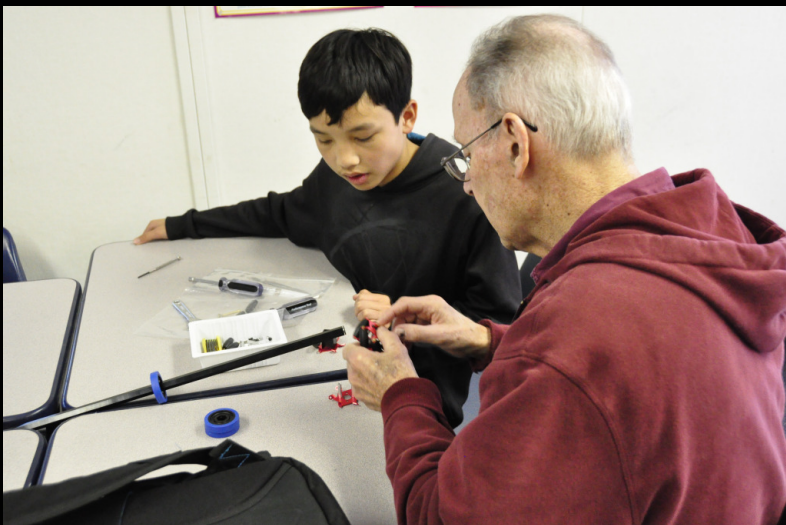
▶ Amrita Iyer (*senior*) and Ria Pradeep (*junior*) show off the drivetrain that they had both designed and made.

# ASSEMBLY

Rahul Iyer (*senior*) tries out the air riveter for the first time.

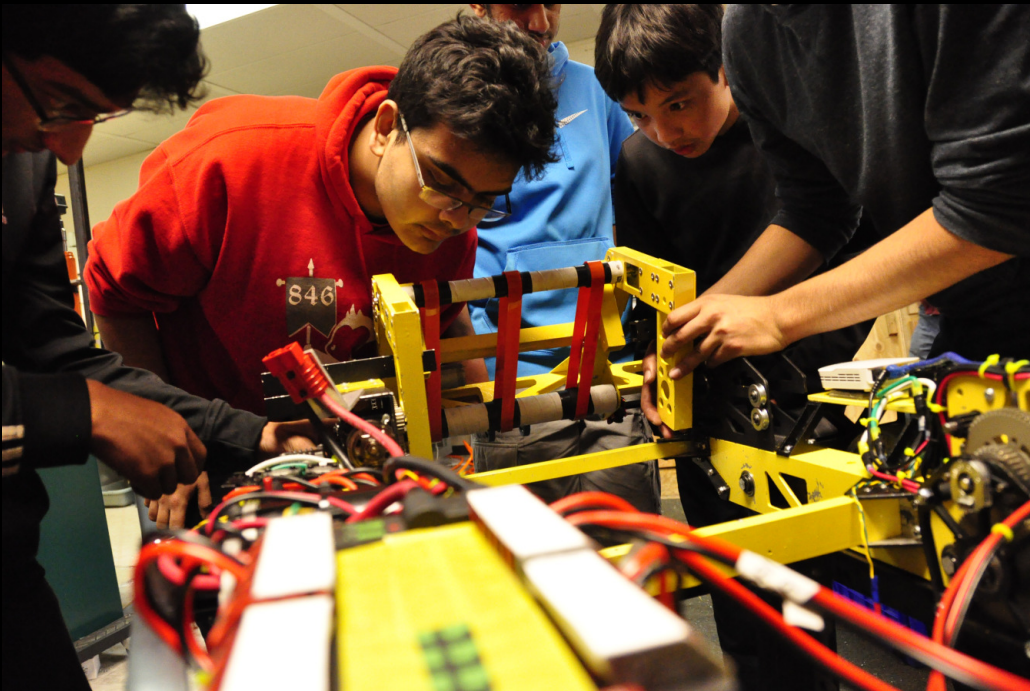


◀ Elton Chang (*sophomore*) carefully rivets pieces of the collector frames together.

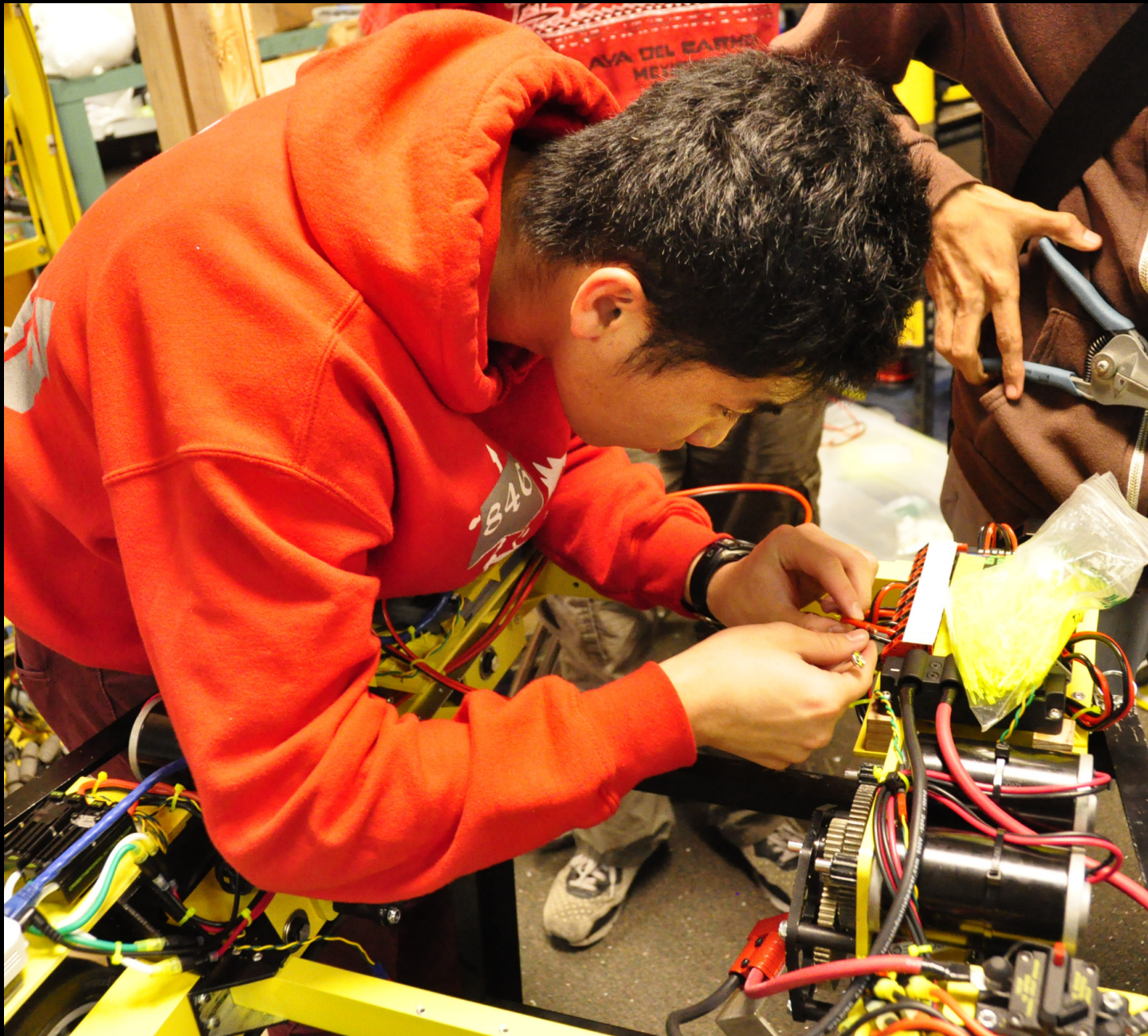


◀ Andrew Ng (*freshman*) discusses with Wes Harrison (*mentor*) on how to attach mechanism wheels onto the collector shaft.

Father and son team Ravi (*mentor*) and Rahul Iyer (*senior*) inspect the drivetrain for any flaws. ▶



◀ Rahul Iyer (*senior*), Srinjoy Majumdar (*senior*) and Andrew Ng (*freshman*) install the collector subassembly onto the drivetrain.



▲ Eric Zeng (*senior*) wires the drivetrain, working carefully and checking every connection.



▲ Andy Chun (*sophomore*) makes sure that the potentiometer is in place.



▲ Monkey Python fires a shot during an autonomous run. We practice outdoors at night because the sun interferes with our infrared camera system.



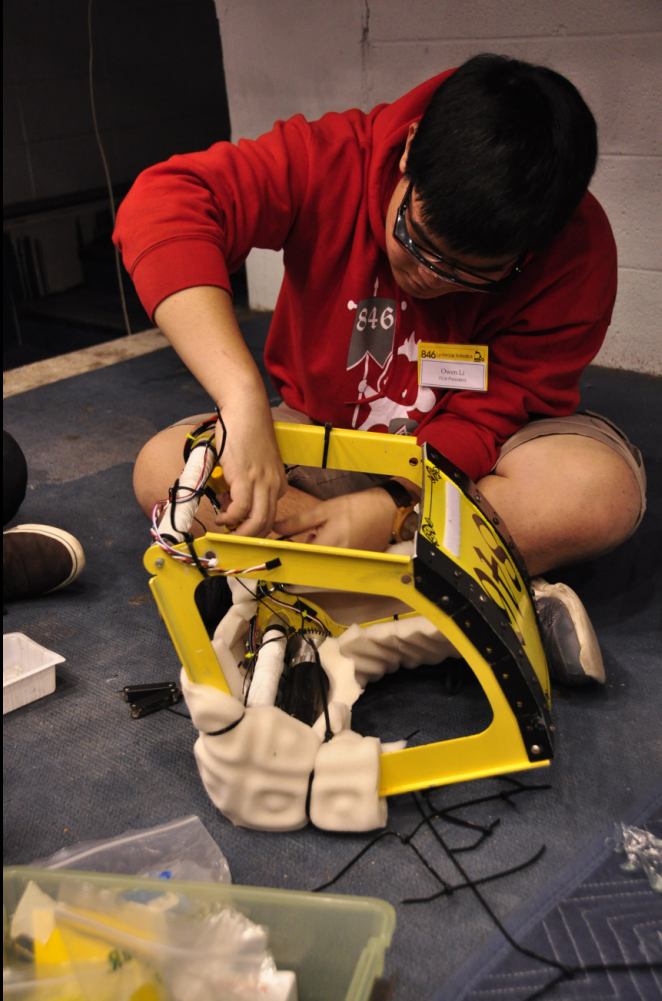


# COMpetition

# NORTH ARIZONA REGIONAL



# ARIZONA NORTH REGIONAL



▲ Owen Li (*senior*) reassembles the shooter head in accordance with recent changes on the practice robot's counterpart.

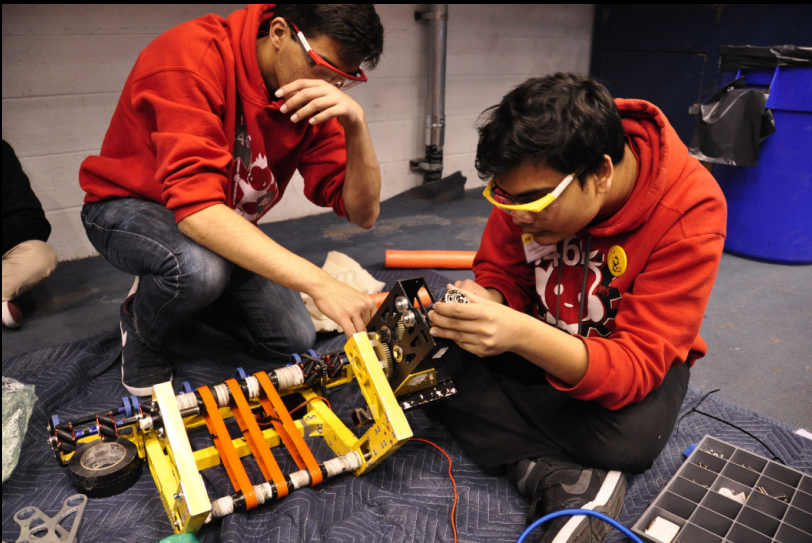


▲ Jing-Chen Peng (*sophomore*) and Srinjoy Majumdar (*senior*) explain our robot subsystems to the judges.

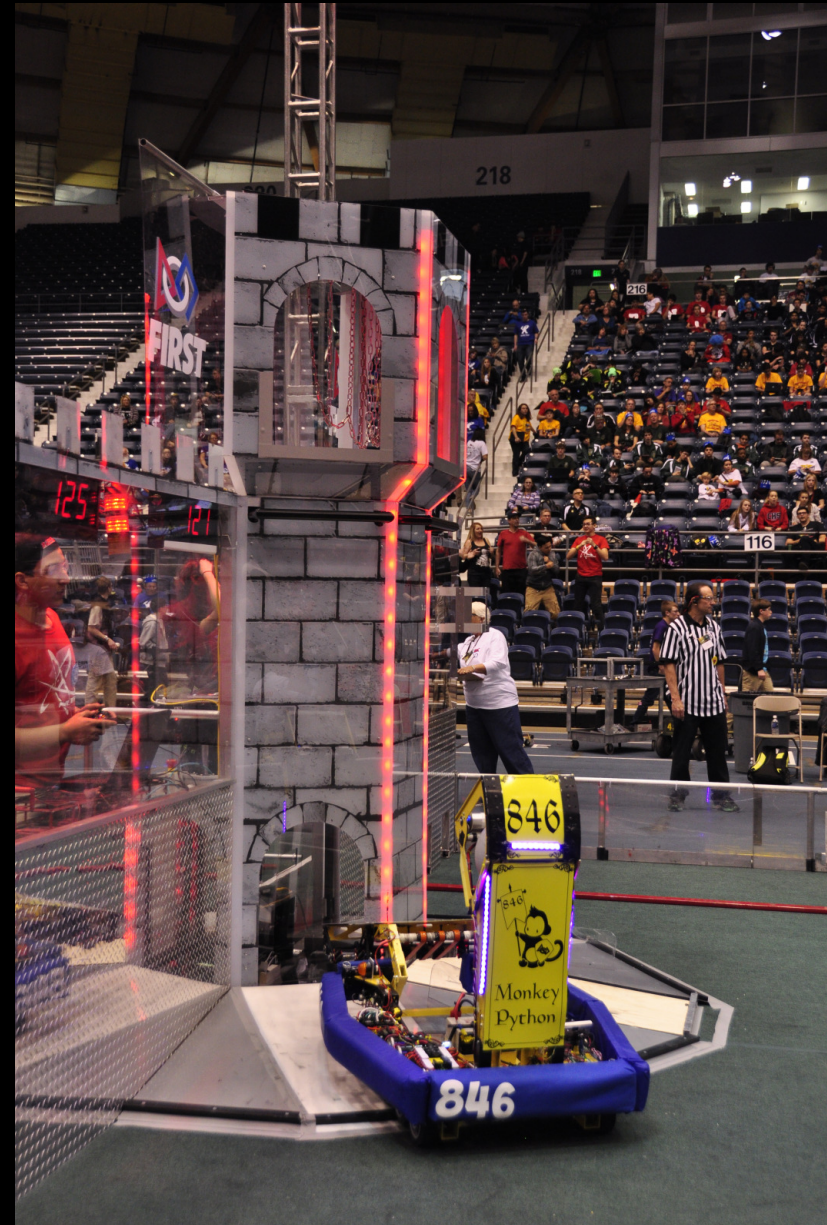


▲ The software team intensely codes the autonomous routine before the match.

Arsh Malhotra (*junior*) holds the collector gearbox as Srinjoy Majumdar (*senior*) screws a gear in place.



Monkey Python lines up to the batter, ready to take a shot.



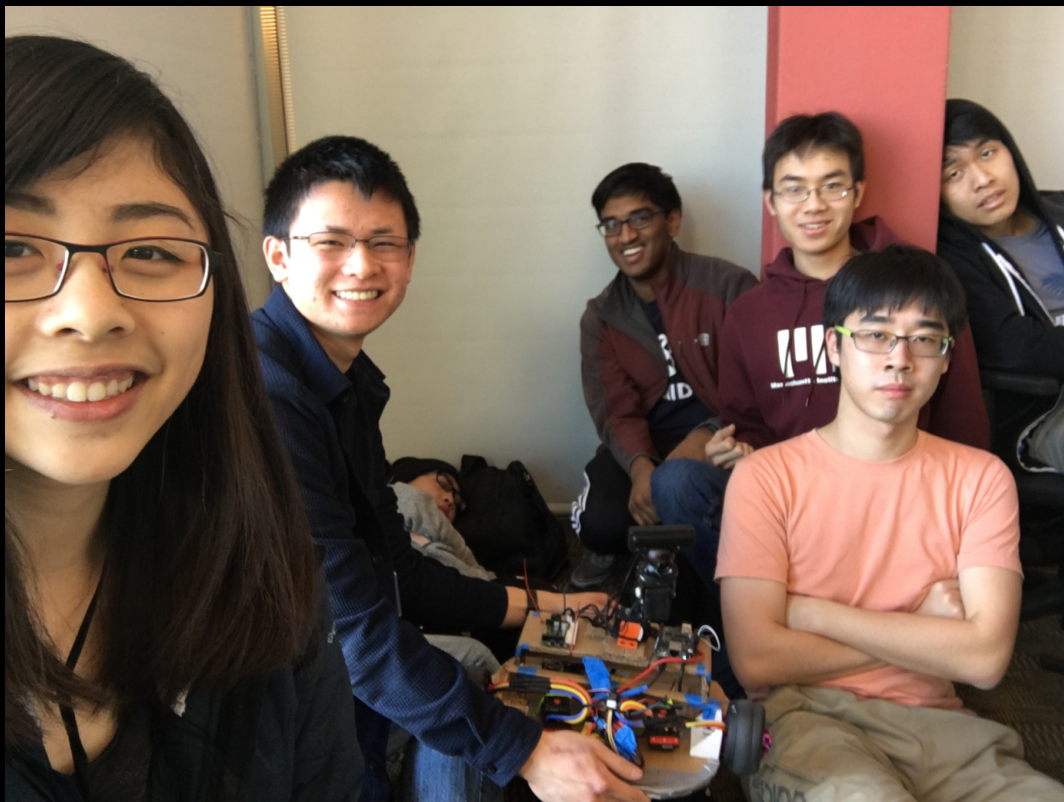


▲ Shalmali Joshi (*mentor*) holds the wire steady as Shikhar Jagadeesh (*junior*) solders the wire to a flashlight for the shooter.

▼ Srinjoy Majumdar (*senior*) explains the collector mechanism to the judges.



# ALUMNI: WHERE THEY ARE NOW



▲ Our alumni from all over the midwestern and eastern states gather for a weekend at the Univ. of Illinois at Urbana-Champaign for the HackIllinois competition.

The camera on the robot is directed to a virtual reality headset that the driver wears, allowing them to see what the robot sees. The team was a frontrunner in the competition until they were disqualified for having too many members.



# AWARDS

## CHEZY CHAMPS: QUARTER-FINALISTS, PROFESSIONALISM AWARD

At the annual Chezy Champs competition, our alliance fought hard and made it to the quarter finals. We also recognized with the Professionalism award for our excellent performance not only on field, but off field as well.

## CALGAMES: FINALISTS, ENTREPRENEURSHIP AWARD

This year, CalGames was hosted here at Lynbrook! We performed excellently, and took home the finalist trophy. We were presented the Entrepreneurship award for our stellar performance in running the team.

## NORTH ARIZONA REGIONAL: JUDGE'S AWARD, SAFETY ANIMATION AWARD, DEAN'S LIST FINALIST



For the amazing work of our talented animation and original music team, we received the 2016 UL Safety Animation award. As winner of this award, our animation "Workin' Safety w/Yo Robot" is shown at 127 competitions around the nation and abroad! We also received the "Judge's Award" for our students' excellent

technical presentation of our robot's design. Finally, Shikhar Jagadeesh (*junior*) received the Dean's List award in recognition of his outstanding efforts and achievements for spreading the ideals of FIRST. The Funky Monkeys are very proud to have members on our team win this award for three consecutive years.

The past four years have been a whirlwind for me. From day one, I have made my way through the small business that we disguise as a school club. I entered the club with certain expectations: to learn about engineering and math, and main objective has been achieved. In this club, I have developed a higher understanding of the engineering process. The experiences I've developed from this club have helped me land internships and will help me tremendously in the future.



As vice president of the club, I have learned much more than just robot-related tasks. I have written corporate grants and have successfully secured thousands of dollars in grants for the team. I have had my photos published in national papers. I have had music I worked on played at competitions around the world. I have reached over 25 million people through Because Robots. But the experience I am most fond of is being able to work with some of the smartest people I have ever met and call them my friends.

Owen Li  
Vice President, 2015-2016



When I joined the team my sophomore year, I had no idea what I was getting myself into. I was interested in technology, but was clueless to how I would contribute to the team. I would sit at the back during meetings, too intimidated to speak up. When build season rolled around, I found myself working in the girl's subsystem, where I helped with small designing tasks, picking up some CAD skills to design a robot dolly. I also learned to machine and ended up in the shop everyday.

This year, I was one of the first ever female co-hardware leads. Initially, I was daunted by my responsibilities, but found that the senior members were ready to help. Over the past year I've learned so much. I applied that knowledge when I designed the drive gearbox for the girl's subsystem and learned to operate our CNCs.

These days, I find that I'm confident in my abilities and not afraid to vocalize my ideas. I've transformed from a shy sophomore to a self-confident individual. Everyday, I look forward to walking into room 612, because robotics has become something I love.

Ria Pradeep  
Co-Hardware Lead, 2015-2016

*The Funky Monkeys would like to thank our sponsors...*



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