



# MONKEY BUSINESS

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



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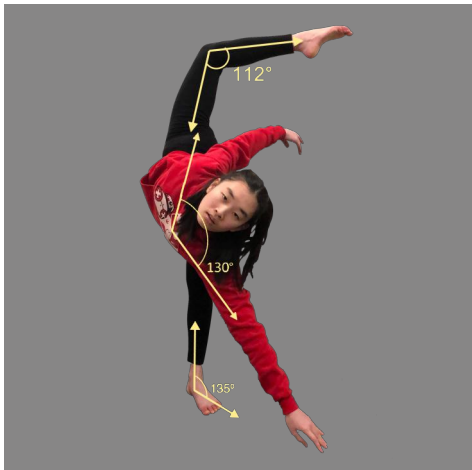
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## STEM: Science, Tendu, Engineering, and Melodrama

Intertwining Robotics and Art

Ingrid Lee (Sr.)

People often think that engineers can't be artists — that the two worlds are too dissimilar to ever overlap. But American singer-songwriter Bridgit Mendler is studying for her PhD at MIT's Media Lab. And model Lindsey Scott, who has dressed for Gucci, Prada, and Calvin Klein, is known for her efforts in developing software for



Ingrid Lee (Sr.) in a ballet pose. Image: Anna Wang

mobile apps. The qualities of the artistic performer and the technical thinker are not as disparate as one may think. In fact, my personal aptitude for engineering has helped me hone my artistic spirit in contemporary ways.

As a mechanical designer and machinist,

*see Robotics and Dance, page 2*

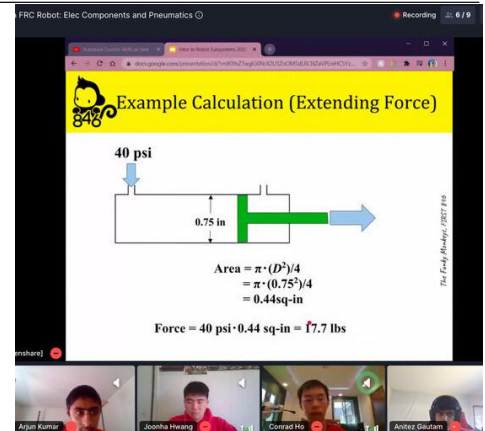
## WRRF Workshops

The Funky Monkeys Present at the Western Regional Robotics Forum

Arjun Kumar (Soph.) and Hari Parthasarthy (Jr.)

One of The Funky Monkey's core values has always been emphasizing learning and sharing our team's knowledge. We've practiced these values by participating in the WRRF's (Western Regional Robotics Forum) yearly Fall and Winter Workshops, where we teach other FIRST Robotics teams around the Bay Area. While this year posed its own circumstances, our team rose up to the occasion. We spent weeks learning technical concepts, practicing demos, and working hard to address the challenges posed by WRRF's digital event platform.

Our biggest talk that we give every year is called *Four Subsystems of a FIRST Robot*. Over six weeks (starting in August), a group of seven presenters prepared slides, practiced demos, and sharpened their presentation skills, with the guidance of mentors



The Funky Monkeys present the pneumatics portion of their Four Subsystems of the FIRST Robot talk.

and team members. Additionally, we had the opportunity to go deeper and build a foundational understanding of the topics we were presenting. As a group, we spent more than 150 hours in Zoom meetings.

During regular years, we typically perform live demonstrations of key topics as

*see WRRF, page 4*

## Fall Social

Getting the Team Together

Yuvraj Dhadwal (Soph.)

With remote learning in place, The Funky Monkeys, as a team, realized that veterans on the team would not be able to meet the incoming members and vice versa. To acquaint both parties, we decided to host a Fall Social. Last year, we had already proven the concept of remote events with a remote picnic activity. With over 40 members in attendance, it showed that it is possible to host a fun and inclusive event that members would enjoy over a Zoom call.

With the goal of bringing members to-



Image by Victoria D. (Soph.)

gether, the Events Planning team worked tirelessly to plan an event for everyone. Reviewing the things that went well and improvements that we could make from the Remote Picnic, we saw that many of the attendees loved Kahoot as an icebreaker

*see Fall Social, page 3*

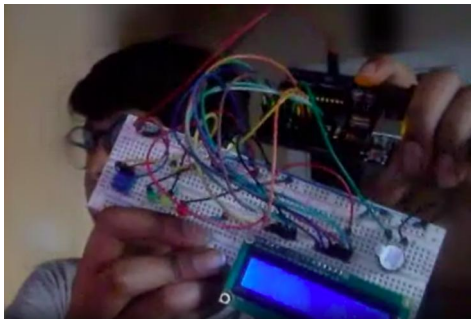
# Arduino Adventures

Miller Robotics during Covid-19

Nandini Rao (Soph.), Agastya Pawate (Fr.)

Every year since 2016, members on our team have volunteered at Miller Middle School to teach participants of the Miller robotics club about the basics of robotics. We guide students through the process of building and programming robots using EV3 kits. These robots then attempt challenges, similar to those in FLL.

To adapt to remote learning this year, the Miller Robotics team worked over sum-



A Miller robotics student showing his arduino project that can display the weather conditions using different sensors.

mer to create an online curriculum that gave our students the opportunity to learn about microprocessors and a variety of electronic components, using Arduino kits.

During the first couple months of the new school year, we finalized details and opened up registration, expecting a maximum of 15 people to sign up. We were surprised when over 50 students registered for this year's program. Though we were excited that our program would reach more students, we were also concerned because we had only three mentors (Kaustubh K., Agastya P., and I). We weren't sure if we could handle so many students and still deliver a high quality program.

We were overwhelmed at the start of the program. There were too many questions for only the three of us to answer. We recruited other people on our team to provide support by troubleshooting with students that were having specific problems with their circuits or code, allowing the three of us to answer more of the conceptual questions and improving the situation overall. The students began to ask more complex questions to gain a deeper understanding of content. Sometimes, I had to expand my own knowledge by researching about certain topics online to answer these ques-



Miller students holding up their Arduino creations from a daily task.

tions. The students also became eager to help each other, and gave each other tips based on their accumulating knowledge.

During the last week, they presented their final projects, which showcased

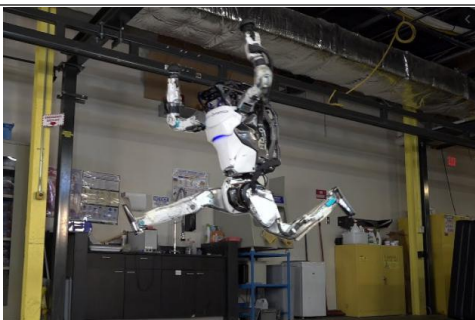
*"It was very exciting to see their enthusiasm and desire to pursue their new interest."*

everything they had learned during the seven week course. Their creativity and knowledge impressed me. They also began asking about when the next session would

see *Arduino Workshops*, page 4

## Robotics and Dance, Continued...

I've always scutinized things with a very inquisitive eye. My work on the gearbox and projectile storage systems within the robot was gratifying because it opened my eyes to all the beautiful intricacies put into one design. As I discovered faults in my mechanical projects and addressed implementation issues, I became a better critical thinker that allowed me to view a complication



The Atlas robot from Boston Dynamics performing backflips and parkour, much like ballet.

tion of conservation of angular momentum as I transition from a passe to a coupe turn. When I head to theatre rehearsal, my understanding of lighting allows me to better comprehend where to highlight and contour on faces or how to better angle the lights to illuminate the sectors of the face that I seek to feature, adding a further layer of realism upon my shows.



Ingrid Lee (Sr.) designing a component for the gearbox on our 2020 robot.

My expertise in engineering, thus, serves my insight in the world of performing arts, enabling me to fabricate more seamless and wondrous creations. Robotics has allowed me to not only further develop my artistry, but grow as an innovator, creator, and thinker, nurturing life skills in me that transcend just technical knowledge, which I will carry forth with me for years to come.

*"My personal aptitude for engineering has helped me hone my artistic spirit in contemporary ways."*

from various different angles. These logical techniques enable me to precisely analyze and research the worlds of theatrical plays and musicals, creating a deeper level of authenticity and audience engagement through my elaborate-yet-accurate costume, hair, and makeup designs. And in my acting, I'm able to depict more realistic portrayals through incorporating more objective angles to my character develop-

ment. Instead of solely focusing on emotional appeals, I instead approach my parts more methodically.

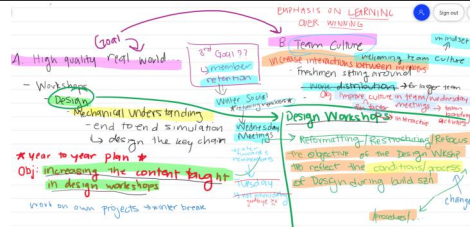
*"Robotics has allowed me to not only further develop my artistry, but grow as an innovator."*

However, logic and analysis are not the only things that come in handy; physics also plays a key role, and the relationship between it and robotics has helped deepen my understanding of the arts even further. When I head to ballet class, I see an applica-

# Jumping on New Initiatives

Covid-19 Can't Stop Us!

Ruhi Aggarwal (Jr.)



- Easier to get work
  - ↳ have more stuff to do as a freshman
- Veterans
  - ↳ difficult to accommodate
- Want to make team function better
  - ↳ Support the environment
  - ↳ transparency in communication
  - ↳ up on the spot
- Strong Team Culture (FUN)
  - ↳ meetings are dragged out a lot - Vivian, 2k20
- Core Values
  - inclusivity
  - teamwork
  - building
  - technical excellence
- delegating responsibility
- feeling safe to speak out

Whiteboards from the Monkey Buddy group's brainstorm sessions.

In a typical year, summer worksessions provide students with personal projects to broaden their scope of robotics and refine their skills through hands-on learning. This year, our team was faced with many challenges presented by remote learning. To make the most of our time, we decided to shift focus to our internal team environment by introducing two new initiatives, Monkey Buddies and Diversity@846.

We wanted to make robotics more accessible and welcoming to new members to ensure that they have an enriching experience on the team. Joining robotics, especially without much prior experience with technology or engineering, can be intimidating due to the steep learning curve. To help new members get up to speed, we started the Monkey Buddies initiative. This workgroup helps the team maintain a high quality learning environment and a positive team culture that promotes inclusion.

We began by interviewing current sophomore members to get an understanding about their experiences on the team during their freshman year. We learned that

the knowledge gap between new and veteran members can make it difficult for new members to actively participate year-round. Our next step was to find ways that we can improve upon teaching fundamental skills, and so we created information documents, presentations, and guidelines that students can refer to throughout the year. For example, we made guides for basic mechanical terms and machine shop tools to supplement hands-on learning. We are confident that with these additional resources, new members will be able to dive right into the robot build season, fully equipped with the skills they need to succeed.

To foster a positive team culture, we also implemented an anonymous feedback form. This form provides a safe place for students to bring up any concerns, general observations, or experiences on the team that they feel needs to be addressed. Going forward, this will help us understand how to help our members feel more comfortable and in-

cluded in our team.

With all the attention around the Black Lives Matter movement in the news this year, we also wanted to explore the issue of diversity on our robotics team, to ensure we are doing our best to encourage everyone to participate. Thus, we launched another initiative: Diversity@846, where we reflect on our team's race and gender diversity and raise awareness of diversity to the team members.

Over the past year, Diversity@846 has been collecting data from the past several years to look for any trends in gender or race within our team. We compared the data we found with the numbers from our school, Lynbrook High School, to search for disparities. We also expanded our understanding of common barriers that make it difficult for students to join and stay on our team by surveying both past and present members.

see Diversity Initiative, page 4

## Fall Social, Continued...

and enjoyed Mafia as the main activity. Armed with this knowledge, we set out to find popular games similar to Mafia. A bit of research (and input from seasoned players on the Events Planning team) led to the selection of Among Us, an engaging, multi-player hit in the casual party game genre.

Leading up to the event, we invited a few veteran members to a run-through of the Fall Social to ensure that the event

*“The turnout was much higher than anticipated. There were over 70 participants.”*

schedule was efficient and the planned activities would work well in an online environment. After the mock Fall Social, the board was set; Kahoot, Skribbl.io, Mafia, and Among Us would be the main attractions.

We scheduled The Fall Social for Saturday, September 26th, and, based on the number of submissions to our signup form, we had expected that we would have only 25 members at the event, so we only had one host for each game and two for Among Us. However, at the event, the turnout was much higher than anticipated. There were over 70 participants, and most of whom wanted to play Among Us.

As a result, we quickly adjusted to the influx of attendees and recruited eight more Among Us hosts, after which the event continued to run smoothly. The event was a blast, and it seemed like the members really enjoyed playing interactive games like



The Funky Monkeys playing laser tag at our 2018 Fall Social.

*“The event truly allowed veteran and rookie members to build important connections.”*

Among Us and Mafia.

Building off the success of the Fall Social we plan to hold more socials throughout the year and prepare for even more attendees in the future.



The Funky Monkeys playing card games at last year's winter social.

**Arduino Workshops, continued...**

start, because they wanted to know more about components that we had not covered during the first session. It was very exciting to see their enthusiasm and desire to pursue their new interest.

*“I enjoyed mentoring at Miller Robotics, and I’m excited to do it again next year!”*

Teaching this course was an extremely rewarding experience. Though it was rough at the start, we learned from it, and things improved considerably as we smoothed out the operations. I became more confident in my ability to teach younger students. I also gained more knowledge about certain electronic components by answering questions and doing more in depth research to accurately



Miller students testing out the DHT11 sensor, which can measure the humidity and temperature.

teach students about them. By doing so, I further explored my own interest in this topic. When I was in middle school, I participated as a student at Miller Robotics. Being a mentor this year was like coming full circle,

and I had a great time watching the students progress. I enjoyed mentoring at Miller Robotics, and I’m excited to do it again next year!

**Diversity Initiative, continued...**

This pushed us to educate our team more thoroughly on the importance of diversity. To ensure that our team was well equipped, we required all members to take the Diversity and Equity Training Modules provided by FIRST. These modules help

*“Both of these new programs have already started to make a positive impact on our team culture.”*

students learn about diversity, and what they can proactively do to be more inclusive. Additionally, in November, we invited Ms. Maria Pizarro, the former National

**Inclusion Feedback (Monkey Buddies)**

The Monkey Buddies team is working to promote inclusion on our team. This form is COMPLETELY ANONYMOUS, so please don't hesitate to give us feedback! Please fill out this form to help us improve the team!

\* Required

Name (first and last) \*optional

What kind of experiences (both positive and negative) have you had when you interacted with others on our team? What kind of changes should be made to the environment of the team? \*

Our new Inclusion Feedback form that we've created to improve our students experience in robotics.

Understanding the demographics of our team to identify and devise strategies to address deficiencies in representation.

A. Understanding racial demographics in the team and Lynbrook	Year 1	Actual	Year 2	Actual
Collecting data or information related to race (or issues related to it)				
Analyze trends based on different groups on the team				
Annual data collection for the team				

B. Understanding gender demographics in the team and Lynbrook**	Year 1	Actual	Year 2	Actual
Make sure to look at participation records (e.g. officers), not just registration records				
Analyze trends based on different groups on the team				
Annual data collection for the team				

C. Creating a plan for action to address	Year 1	Actual	Year 2	Actual
Create a plan to address the problem:				
Understanding diversity from outside sources				
Improve image of robotics in Lynbrook students (not part of team)				
Diagnose current problem solving strategies				

D. Other diversity tasks	Year 1	Actual	Year 2	Actual
Bring in guest speakers regularly to our team (at least a couple of every year)				
Presentations to the team about Diversity				

**Our strategic plan for the Funky Monkeys Diversity group.**

President of MAES (the Society of Mexican American Engineers & Scientists), to speak to our team. Ms. Pizarro gave a great talk about diversity using her life experiences in the workforce. With the success of her presentation, we are arranging a second talk with the Worldwide Education External Programs Manager for Diversity and Inclusion at Apple.

Both Monkey Buddies and Diversity@846 have already made a positive impact on our team culture. The Monkey Buddies team has provided the resources needed for new members to ensure they receive the most immersive experience on the team. The Diversity@846 team has started identifying barriers that prevent students from joining or staying on the team and has been actively looking for new ways to make the team aware about diversity and inclusion. These two initiatives are helping us improve our team environment and will have a long lasting impact on our robotics students.

**WRRF, continued...**

part of our presentation. However, the virtual setting of the event prevented us from doing so this year. Each member of the team needed to learn how to create pre-recorded videos of the demos instead. When we were recording the demos for the pneumatics portion of the presentation, we had to learn how to set up our demos properly and draw attention to the main aspects of the demo. It was a fun challenge, and we were able make a series of short 1-2 minute videos.

It was truly gratifying to share our knowledge with an audience of over 50 attendees. The entire presentation process taught us personally a lot about the electrical and pneumatics systems, how to deliver a presentation in a concise way, and even how to record informative videos. Before presenting to others, we had to ensure that we understood the concepts, and that we were ready to answer any questions.

On the weekend of the WRRF Fall Workshops, we were anxious about our presentation. We wanted everything to run perfectly. Once we started presenting, we really got into it. There was something fun and exciting about teaching others. For us, the biggest highlight of the experience was knowing that we helped people in the audience learn how to build their own innovative robots

As we near the end of the 2021 season, we hope to carry everything we learned from preparing/presenting for the workshops into the future, from the robots we can build to the knowledge we can share. We are excited to present again next year!