

# Engineering Portfolio

## 2021-2022

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# #202123





# Team Members

**Rayan Elias**  
Captain

Rayan is the captain of the FTC team Cryptic #20123. As an inquiring student and avid advocate of STEM, Rayan hopes to take Cryptic beyond FTC and promote the joys of STEM throughout the community.

**Enoch Li**  
Building Lead

Enoch is the build lead of team Cryptic. He designed the custom plates for the robot as well helped assemble the robot together. In his free time, Enoch enjoys learning physics and hanging out with friends.

**Bill Wang**  
Programming Lead

Bill directs the software sector for the team. He also designs and 3D print parts for the robot. During his free time, Bill likes to read science fiction and watch movies.

**James Li**  
Builder

James is in charge of graphics design and rendering. Outside of robotics, his interests include graphic design, 3D modeling, and math.

**Daud Idrees**  
Builder

Daud is an aspiring engineer. He helped design and print the outtake system using CAD. Outside of FTC, Daud enjoys spending time learning about machines, tinkering, and reading.

**Sidharth Garg**  
Builder

Sid is a senior in Centennial High School. During middle school, he joined a class involving Ev3 and hopes to solve worldwide problems with these skills.

**Kelsey Lo**  
Programmer

Kelsey developed a strong desire to pursue further into computer science as she explored its limitless possibilities. Now, she aspires to expand her programming knowledge into the field of FTC robotics and construct a robot with her team.

**Emil Jiang**  
Programmer

Emil Jiang is new to FTC and a programmer on Cryptic. He likes taking CS classes at school and hopes to do it in the future. He aspires to get better at Java and help build a robot with his team.

**Raiyan Zaman**  
Programmer

Raiyan assists in programming and engineering the robot. Aside from FTC, he enjoys watching football and basketball.

# Team Overview

## ABOUT US

Team **Cryptic #20123** is a **first** year FTC team that is based in Ellicott City, MD. Our members are all from Centennial High School and range from **freshmen** to **seniors**. Many of our members have previous experience in FTC, FLL, and even FRC. Despite our unique backgrounds, our love for robotics have resulted in us forming this team. Currently, we have 9 members, 5 of which are **new** and 4 returning **veterans**.



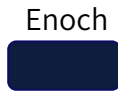
## TEAM STRUCTURE

Captain



Rayan

Team Leads

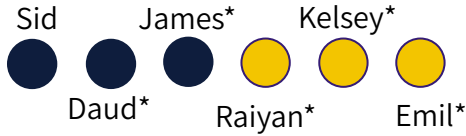


Enoch



Bill

Team Members



Sid

James\*

Kelsey\*

Daud\*

Raiyan\*

Emil\*

*\*New members in FTC are denoted with an asterisk*

Our team is mainly split into two subgroups: **building** and **programming**. Due to the difficulty outreaching this year with the **COVID-19** pandemic, everyone helped to market and find **outreach** opportunities. All our members have multiple roles at some capacity, which leads to a higher level of **cooperation** and **communication**. We have two leads and one captain on the team, which offers members to both **collaboratively** learn through their **experiences** while finding the opportunities to take **initiative** in their respective subgroups.

## OUR MISSION AND GOALS

*Our mission is to encourage learning in all aspects of FTC through hands-on building, programming, and marketing, as we support students of various interests in collaboration. We also strive to provide outreach opportunities for our members to learn, while we engage and educate our local community in STEM.*



### Our primary goal for 2020-21 season:

- Teaching our members who are new to FTC: As a rookie team, Cryptic relied heavily upon the experience and knowledge of its returning FTC competitors. We wanted our inexperienced members to learn valuable skills in the future in FTC.

# Organization

## 2021-22 MEETINGS & STRATEGY

We had 2 weekly team meetings (1 virtual and 1 in-person) where everyone discussed the plan of it and then split into groups:

- Builders focused on CAD and design, planning the design before physically building to minimize wasted parts and in-person meetings.
- Programmers simultaneously created code subsystems while components were being designed.
- Marketers focused on optimizing virtual/physical outreaches, planning and coordinating virtual engagement in the community.



To collaborate virtually, we took advantage of various platforms:

### Communication/Meetings

### Files/Organization

### Cloud-Based Version Control



Discord



Google Meet



Zoom



Excel



Jamboard



Google Drive



GrabCAD

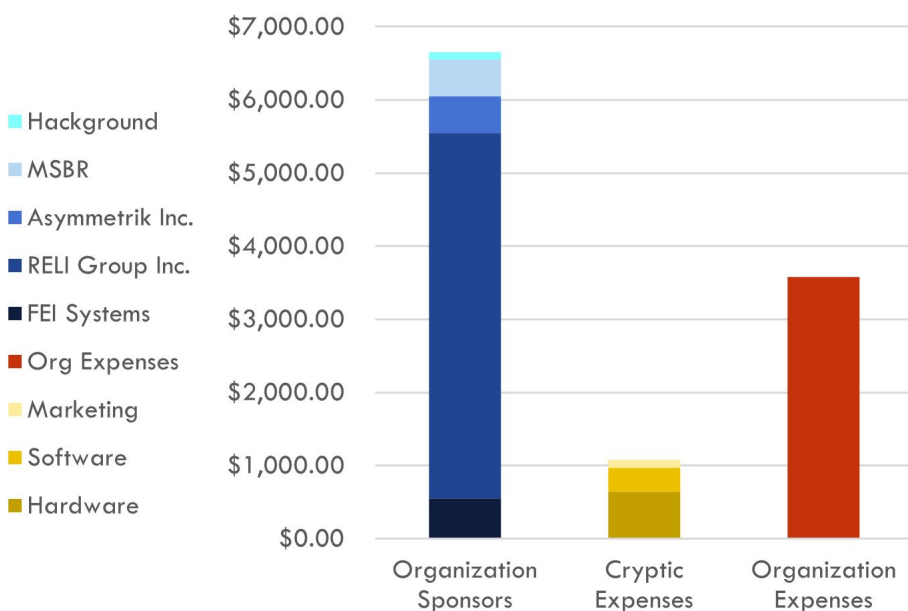


GitHub

With these adaptations, we significantly reduced the number of physical meetings, which were only used for necessities: testing, building, and recording.

## FINANCIAL INFORMATION

### 2021/2022 Cryptic Income & Expenditures



Our team's sponsors are able to redeem tax exemption from their donation to our team due to our affiliation with **Centennial Robotics Inc.**, a non-profit organization that hosts our team and two others.

As the **COVID-19** pandemic progressed, it became increasingly difficult to collaborate with sponsors. Nevertheless, a few generous local businesses helped support our team.

To alleviate costs, we built our robot to be exactly as we envisioned it. This meant that every part had to be designed carefully for **CNC milling or 3D printing**



# Outreach

## Taking Your FIRST Step in STEM

In partnership with the **Howard County Library System**, Cryptic debuted the “**Taking Your FIRST Steps in STEM**” event at the Miller Branch Library. We hosted this event and other variations later at **other HCLS Libraries**.



Some of the activities we coordinated:

- **Build a Boat:** Participants are given a sheet of aluminum foil and are tasked with creating a **boat-like structure** that can float in a tub of water with added pennies
- **Learn to Code:** Participants will get an accurate feeling of how programmers try to solve **difficult** problems in different ways using block code
- **Design a Plane:** Students learn to create an efficient paper airplane using the **design process** taught by the design team

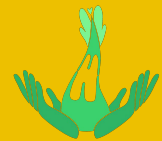


## Maryland STEM Festival

At the Maryland STEM festival, we were invited to **present** our team robot as well as host a workshop for **various FLL teams**. We decided to display a **robotic arm** that can mirror a person’s **movement** as well as give an aluminum boat challenge.



## Partnering with Hope to Hands



We supported Hope to Hands, a nonprofit organization created to support families in need from COVID-19. They helped create our custom team shirts! The organization:

- Raises funds to **donate** money
- Gathers **necessities** for the needy
- Provide diverse career speeches to help high school students **discover** potential career paths



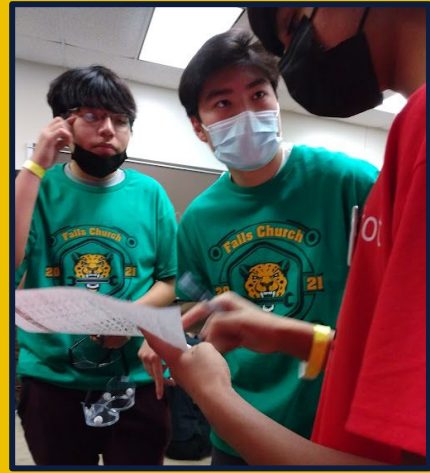


# Volunteering at Qualifier



At the competition our team members assisted in a **queuing** up teams up for various matches as well as helping clean up the fields afterward.

At the beginning of the season, many qualifiers needed **volunteers** to help manage the competitions. To support the **hard-working** individuals who make FTC possible, **our team** decided to go help out at the Laurel qualifier.



During our time at the qualifier, we learned a **lot** of lessons from other teams and **experienced** how the competition worked in person and up close. This opportunity also allowed us to **network** with other teams and learn about other team's robots and set up potential future **outreaches**



As a rookie team, Cryptic was primarily composed of **new** members to FTC. This meant that we had to collaborate with **many** teams, particularly **veteran** ones, to **learn** as much as we could.

- Team **VIRUS #9866** is an accomplished FTC team who placed in the international round multiple times
- They helped us assess our **brainstormed** ideas and game plan for programming

## Team VIRUS



## Team RobotBirds

- We got in contact with **Team RobotBirds**, a robotics team based in **Greece**
- Together, we discussed our different robots and **plans** for the season