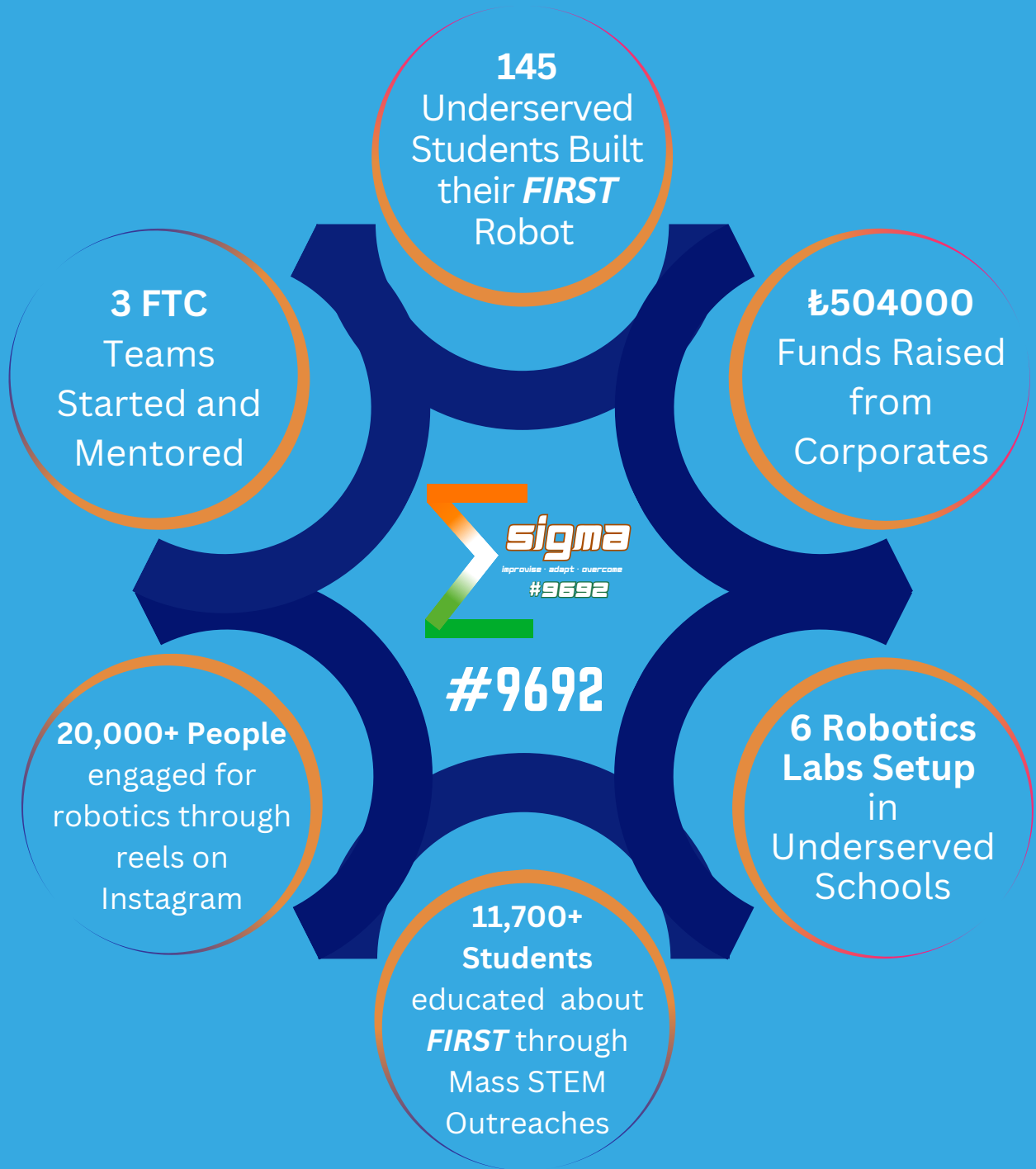




# THE INDIA IMPACT STORY

## BY SIGMA



### SIGMA ALUMNI PURSUING STEM AT:



# Preface

Although extremely excited, FRC came as an overwhelming competition for all of us at team Sigma! The entire journey has been nothing short of a roller coaster ride. Right from daring to bring 150 kgs worth of robot building and control system materials all the way from USA in person to hunting for so many new members in the team, we have done it all, successfully! Our journey from skill building sessions to the actual build season to finally writing this preface and preparing to fly out for the regional chapter has been filled up with infinite memories and emotions. As the most diverse community FRC team from India, we aspire to grow FIRST in the most sustainable manner in India and beyond. While the rookies in our team always look up to the veterans, our coaches have always tried to create an environment of transparency, equality and respect for everyone in the team. Being rookies, this is just a starting point for our long and impactful journey ahead. The team lunch and snack time, the pizza parties, the late night ice-creams, the birthday celebrations, the fun arguments over T-shirt colour selection to the type of reels to post, it is this *FUN* that we all will always cherish and be thankful to *FIRST* forever! Here's to umpteen seasons of FRC #9692 Sigma, building the best robots, uplifting the underserved in robotics, encouraging the corporates to support and fund our lab setup initiatives, starting and mentoring more FIRST teams and beyond!

Ganpati Bappa Morya!



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# Team History

Sigma is a summation of the *FIRST* Core Values. This community team consists of 26 members from 10 different schools across Mumbai, India. We are united by a common passion for robotics and STEM.



- All of our team members must graduate to pursue STEM careers in the future.
- Foster the culture of Leadership, problem solving and transparency for everyone in the team.
- Enabling the underserved to learn technology in fun and hands on manner.
- Start many more FIRST teams across India.



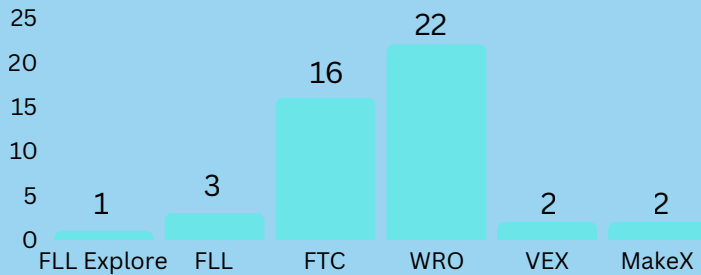
- Become one of the most technically sound FRC team of India.
- Run the most exceptional community outreach programs - to uplift the underserved in robotics and coding.
- Closely work with the top 10% corporates in India to fuel our outreach dreams.

- Teamwork
- Innovation
- Gracious Professionalism
- Cooperation
- Aspiration
- Empowerment
- Enthusiasm

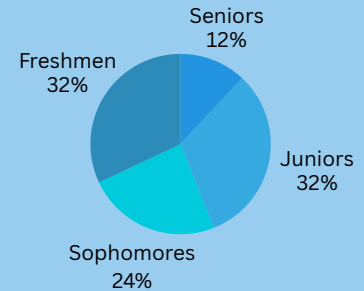
# Team Statistics



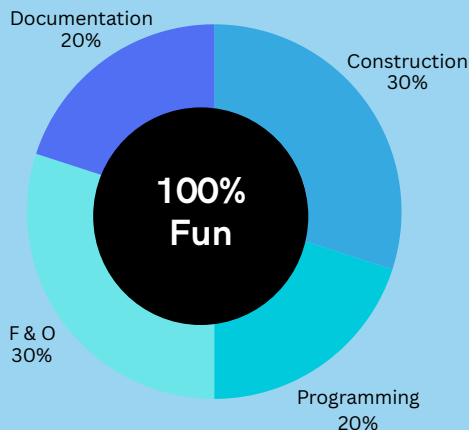
**Prior robotics competition experience**



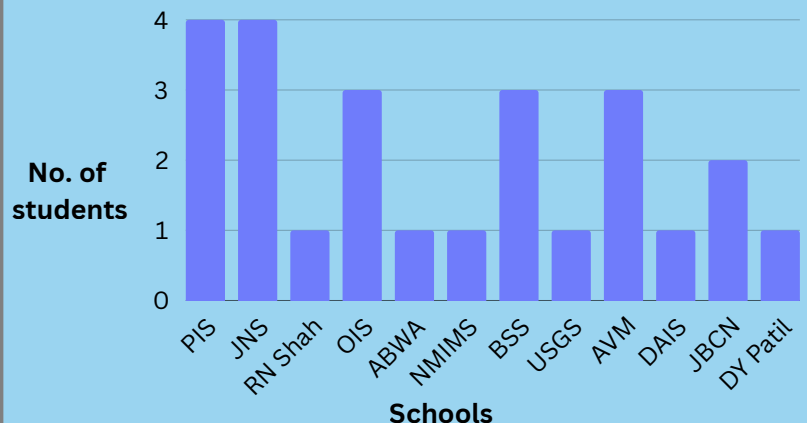
**Grade wise distribution**



**Skill strength of the team**



**School wise split of the Team**



# Team History



With a vision to hone our technical skills in the field of robotics, we plunged into this amazing world of *FIRST!* Knowing *FIRST* better with each passing day, we imbibed the *FIRST* Core Values in our day to day life over a period of time. And this was done all while passionately uplifting the underserved community around us in the field of robotics and coding with *FIRST!*



## FTC 2019-2020 SKYSTONE

- 15 rookie members and one student mentor
- 10+ community outreaches
- 3+ fund raising events.
- 60+ hours of skill building sessions.
- Control Award Winner



## FTC 2020-2021 ULTIMATE GOAL

- Participated in online format at Mexico and IOWA championships.
- Clinched the Think and Motivate Awards respectively.
- Conducted 3+ online outreach events for the underserved.



## FTC 2021-2022 FREIGHT FRENZY

- With all our past experience, finally went on to win the winning alliance captain Award.
- Represented India at FIRST World Championship, Houston, standing 10th in Robot game.



## FTC 2022-2023 Power Play

- Inspired 2 new FTC teams in India and mentored them for the preparations.
- Clinched Think Award in Indian National Championship and awarded Inspire Award in Asia-Pacific Open Championship 2023.

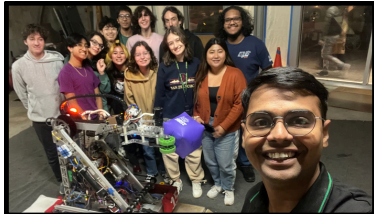
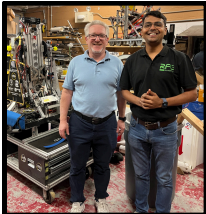
# FRC Rookie Year Timeline



The moment we won the Inspire Award, we decided to graduate to FRC, come what may! With an intent to gain skills and eventually jump into the build season, we kickstarted our journey in September 2023. On the way, we have overcome quite a lot of hurdles, right from part procurement from USA to KOP (Kit of Parts) procurement from Turkey. It was roller coaster ride! One thing that we kept constant was: our energy, implementation of the *FIRST* Mission and consistent community upliftment programs!

## SEPTEMBER 2023

- Had an informative parent orientation
- Plans to recruit more roboticists in the team and its execution
- Skill building sessions begin

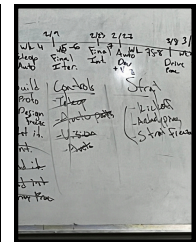
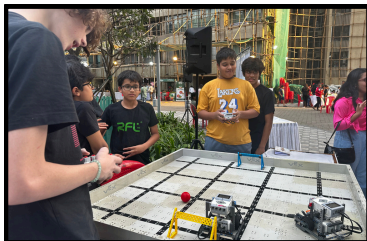


## OCTOBER 2023

- Full-fledged technical skill building including learning Java and Python
- Got a hang of 3D modelling softwares like Solidworks and Onshape

## NOVEMBER 2023

- Head Coach travels to the U.S. to procure robot starter kits
- Established strong networks with 4 veteran FRC teams: 806, 1676, 11, 9105
- Hosted head coach of FRC Team #7525 for a 2-day FRC introductory workshop in India.



## DECEMBER 2023

- Development and implementation of a swerve drive system on the robot
- Constructed an introductory FRC chassis
- Outreach & fund raising sessions were underway

## JANUARY 2024

- Retrieved KOP from Istanbul.
- Build season begins.
- Brainstorming, strategizing and prototyping

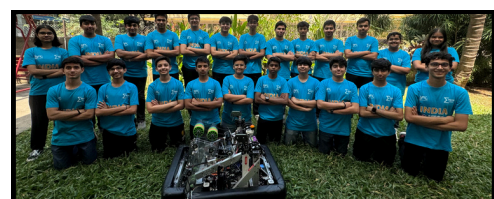


## FEBRUARY 2024

- Travelled to New Jersey to learn from FRC Team #1676 Pascack Pi-oneers for 1 week
- Final version of the robot with machining.
- Lab setup for underserved.

## MARCH 2024

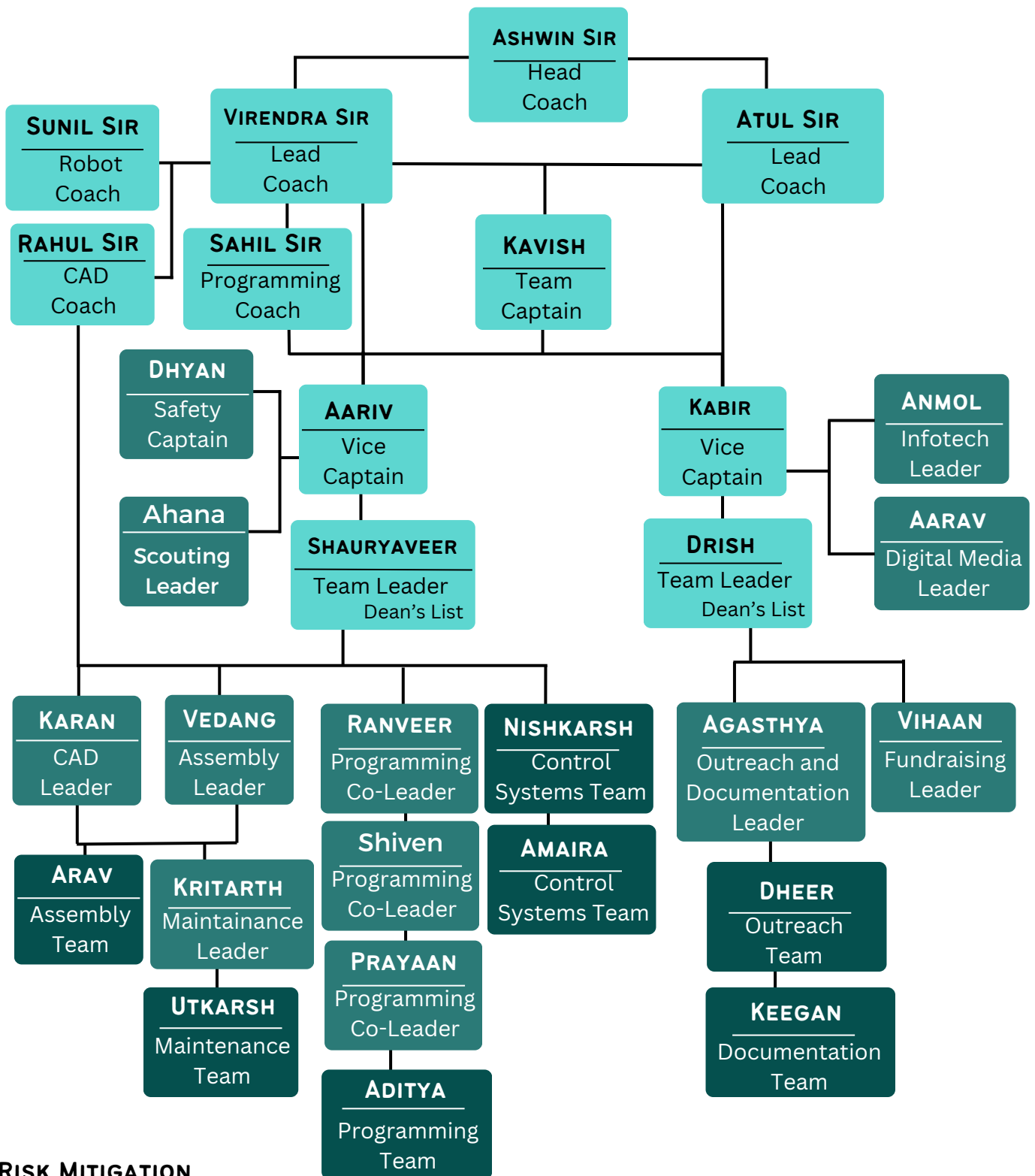
- Driver practice. Driver selection.
- Documentation and team branding.
- 2 Regional competitions in Turkey.



# Team Organisation



We at FRC Team Sigma believe in team work and ownership. As a team of 26 students, we have diligently divided our roles and responsibilities to ensure that we work as a lean startup. Each division has a team lead and supporting members. Based on time commitment, many members on the team have taken multiple responsibilities as well. Based on our strengths, this is the organisation chart that we have followed as FRC Team Sigma for this season!



## RISK MITIGATION

Our team shows a great balance for functioning under all circumstances. While we feel our organisational structure is lean, there is enough room for people to grow over the period of time in the team. Not just this, we have backup players across all verticals. Even for our coaches, we have atleast two coaches in each sub-section, allowing us to work efficiently and fearlessly.

# Recruiting New Members

We realised that we will need at least 20-25 members on the team, fulfilling different responsibilities, to participate and effectively contribute on all fronts of the FRC competition. We took a 3 pronged approach to recruit new members quickly and eventually kickstart our skill building journey!

1

RFL Academy, our training provider, caters to hundreds of students for various robotics courses each year. They shortlisted a few students and conducted an orientation with their parents for the same.

2

Based on our FRC team recruitment presentation, we reached out to our friends and families and sought expression of interest to join the team. Our mentors had a one to one call with them to assess if they can be a part of FRC program. Upon their approval, they joined the team Sigma.

3

We participated in two exhibitions, conducted by the leading career counsellors for high school students in Mumbai. We explicitly promoted FRC participation and recruited two new members on the team.

## EXEMPLARY SWOT OF A NEW MEMBER

### STRENGTHS

- Strong experience in robotics competitions
- Passionate members - impactful work.

### WEAKNESSES

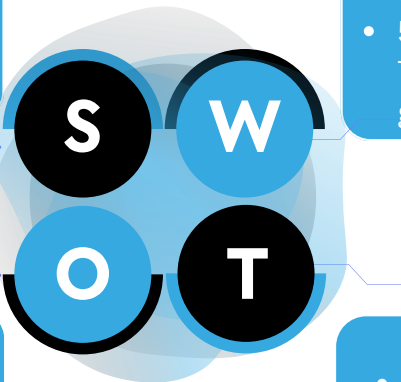
- Academic pressure - leading to comparatively less time for FRC
- 50% members are rookies. Takes time to get into the groove of the program.

### OPPORTUNITIES

- 80% members are in grades 9 to 11. Less effort to encourage continuity.
- Can recruit students with diverse interests, beyond robotics.

### THREATS

- Long commute hours for a handful of us.
- 10th and 12th standard students finds it difficult to balance academics.



# Training Of New Members

We kickstarted our FRC journey with key training sessions. All the members were asked their area of interest (CAD / Coding) and were put in skill building sessions accordingly. We also diligently had two different curricula - one for completely rookie members and one for the FTC experienced members. CAD with Solidworks was a 30 hours curriculum for rookies and coding Java along with Python Open CV was a 50 hours curriculum for all the coding members on the team. We also focussed on getting trained for control system for an FRC robot in this journey. Many things were taught to the rookie members by the veteran FTC members during these skill building sessions. In this journey, we have documented everything, which can be used by any rookie member in the future!

## CAD learning

We focused on learning Solid work from our coaches in a hands-on manner. We learnt the following in this 30 hours of skill-building session :

1. Engineering Drawing
2. Dimensional sketch
3. Orthographic and Isometric projections.
4. Design tree
5. Part studio
6. Part assembly
7. Sheet metal
8. Gear design



## Java + Open CV

We realised that Java coding and Open CV will be needed to code the FRC robot and make it function as desired. We learnt the following concepts in the 40 hours of skill building sessions :

1. Basics of Java
2. OOP concepts.
3. Basics of python coding.
4. Image Manipulation.
5. Video Manipulation.
6. Integrating Limelight camera.
7. Integrating WPI Libraries for the coding.

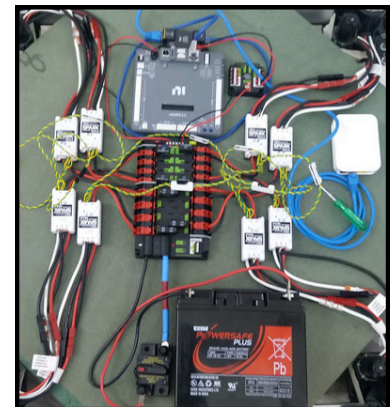


## Control Systems

Control system is the heart for any robot. We were introduced to the fascinating world of control systems in hands on informative manner. We learnt about :

1. Robo Rio
2. Circuit Breaker
3. PDP and PDH
4. Motor Drivers
5. RSL
6. Wifi Router
7. Encoders
8. NavX

and understood how to connect them all to make sure that all the electronics and electrical equipments are working on cohesion.



Us being Rookies, we have always wanted to keep our eyes open and freely learn more about the *FIRST* Robotics Competition, and we were able to do so by going under the wing of the Lead Mentor of Team 7525 Pioneers, Mr. Bryce Hanson. Mr. Hanson is a *FIRST* alumni who was more than happy to visit Mumbai, where we hosted him, to mentor our team so that we can successfully understand what it takes to be an all-rounder FRC team and how to go about our FRC season.

## 2-DAY WORKSHOP

### DAY 1 - 25 NOV '23

Taking the leap of faith from FTC to FRC is huge. This is what Bryce taught us:

- Awards in FRC
- Changes in regulations from FTC to FRC
- What it takes to be a Rookie All-Star

Technical work:

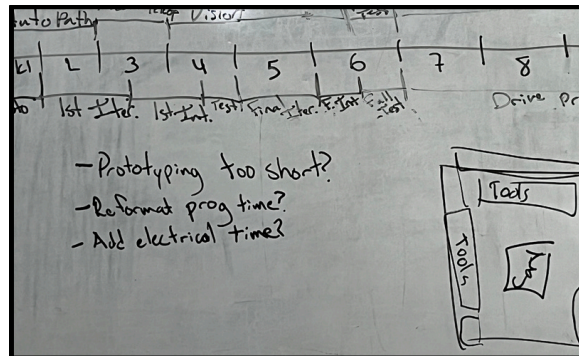
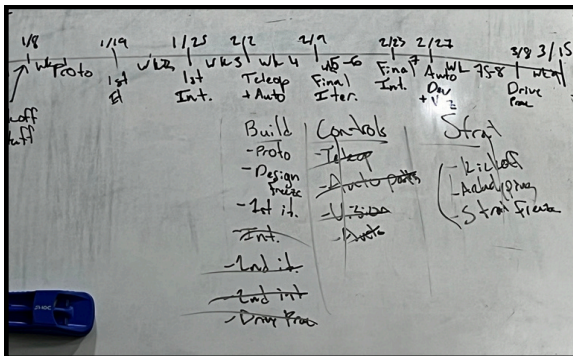
- Created a 'technical-timeline' to plan our journey
- Made a robot plan depending on specific restraints like:
  - Experience of members
  - Funds for procuring robot parts
  - Field area and working space

### DAY 2 - 26 NOV '23

- The mechanical or technical part of FRC is also much different than FTC, therefore we needed much guidance in this field and luckily Mr. Hanson is an expert at construction.
- We were able to grasp different robot mechanisms from past robots designs and also went through the basics of the control systems.

Kick-off day is an essential part of FRC, so to be ready with our paraphernalia for the big day, Bryce helped us conduct a 'Mock Kick-off' for the 2018 Power Up season. This included:

- Going through the Game Manual
- Solving a Shaker Sheet
- Deciding what tasks to solve
- Looking at winning-robot designs





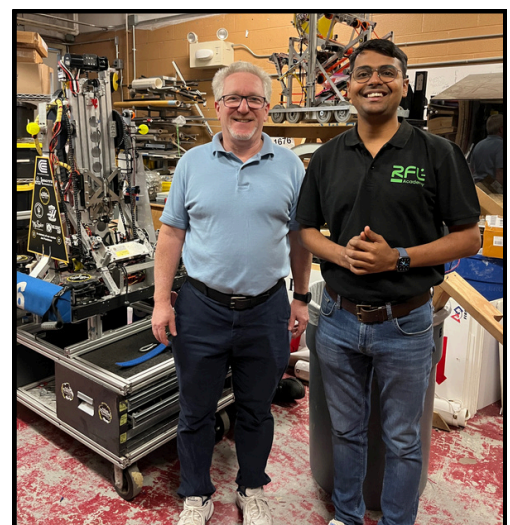
## HUNGER TO LEARN -TEAM 1676 PASCACK PI-ONEERS

### ABOUT THE LEARNING PROGRAM

- FRC Team 1676, also known as the Pascack Pi-oneers, is a high school robotics team based in Montvale, New Jersey, USA. Our Head Coach, inspired by fostering collaboration within the region, embarked on a visit to different teams in the New York, New Jersey Region in November 2023 where he met Team 1676.
- This positive experience ignited the idea of a Learning Program, suggested by Team 1676, where members from our team would travel to Montvale and gain valuable knowledge and skills. Our head coach happily agreed to this idea.
- Three members and one coach flew to Montvale to spend an incredible week with the team. The three members spent their first half in school and the second half of the day with the team :
  - Mentorship: Learning directly from experienced members of Team 1676.
  - Shadowing: Observing their design, fabrication, and programming processes.
  - Collaboration: Working on joint projects or challenges.
- This program would provide our team with a unique opportunity to:
  - Enhance our skillset: Gaining new expertise in robotics through hands-on experiences.
  - Build relationships: Fostering connections within the FIRST community.
- Learn from a winning team: Team 1676's experience can provide valuable insights and strategies.

### OUTCOMES OF THE LEARNING PROGRAM

- Enhanced Skills: Mentorship and collaboration led to deeper understanding of robot design, improved fabrication techniques, and effective programming strategies.
- Tangible Results: Increased efficiency through improved organization and problem-solving led to innovative designs and a smoother build process.
- Community Building: Strong relationships with Team 1676 fostered ongoing collaboration within the FIRST community.
- Collaboration Power: The program solidified our belief in the power of collaboration within FIRST, and we look forward to future learning opportunities with other teams.



# Gracious *FIRST* Collaborations

## DAY 1 - 5 FEB '24

- We were acquainted with the Pioneers and their coaches
- Introduced to the 1676 proof of concept robot design by team CEO
- Lisa, non-tech coach, walked us through team structure
- Awestruck by 1676 scouting team

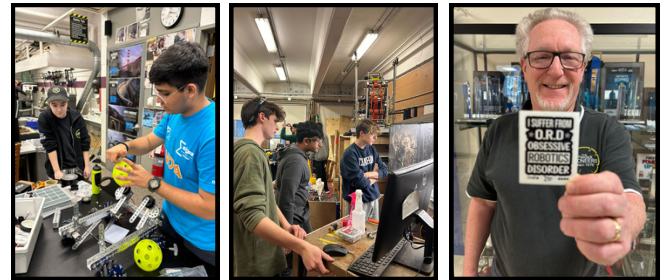


## DAY 2 - 6 FEB '24

- Acquired safe use of power tool certification
- Worked along with mechanical to troubleshoot PoC robot
- Helped chassis team begin construction of a final flight chassis

## DAY 3 - 7 FEB '24

- Introduced 1676 CEO to their new FTC showcase bot—constructed by our accomplished ex-FTC members.
- We were educated on CNC basics from mechanical sub-division head.
- Eagerly participated in a mock Human Player trial.



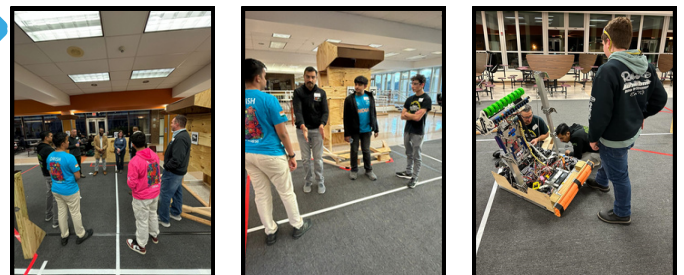
## DAY 4 - 8 FEB '24

- Lisa briefed us on the Rookie All-Stars path to success.
- Decided on some new team colors with some invaluable feedback.
- Worked on manufacturing of flight bot mechanisms



## DAY 5 - 9 FEB '24

- Met with one of 1676's sponsors, Crestron
- Deliberated on the robot game and potential auto strategies with 1676



## DAY 6 - 10 FEB '24

- Expressed our gratitude to our hosts and gifted the pioneers a small token of our appreciation for all their help and gracious professionalism



We strongly believe at Sigma that we should make Robotics more accessible and intriguing to the undeserved community. In an attempt for that we contacted a myriad of NGOs and underserved government run schools and conducted exhilarating sessions where students were engaged in-building and coding their own robot using Lego Mindstorms EV3 which we would bring with us. These students went back with an introduction to Robotics and STEM and headful of aspirations to pursue FIRST competition in the future. We were using our own robotics kits during this campaign.

## BIMA NAGAR SCHOOL - 18 DEC '23

- This school teaches the children of rag pickers and street hawkers within the Borivali area of Mumbai.
- 45+ students built and coded their *FIRST* robot with us.



## M.P.SHAH SCHOOL - 14 DEC '23

- 40+ students got their FIRST hands-on experience with robots
- School is keen to have a robotics lab in future for them.

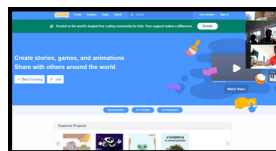
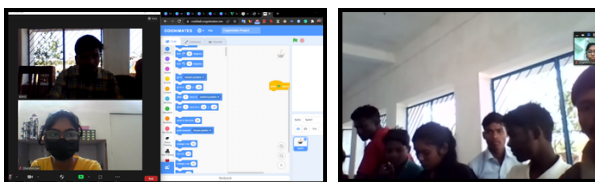
## AKANKSHA FOUNDATION - 16 DEC '23

- 30 students built and code their first in this workshop.
- We encouraged them to participate in our FLL kickoff!



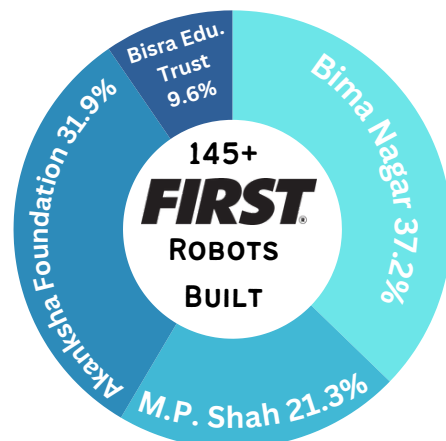
## BISRA EDUCATION TRUST - NAVADHA SCHOOL 21 SEP '23

- It is based out of the state of West Bengal, 4000 km from Mumbai.
- We conducted an online coding workshop with 30 students - teaching them how to design and code their own games using Scratch programming language.



## REFLECTIONS

1. We need to step up our efforts to conduct many more of such sessions in the upcoming seasons of FRC!
2. Many students and schools wanted continuous access to robotics and coding in their school - as it interests them a lot.





## EDUCATIONAL COUNSELLORS

Majority of the high school students in India either pursue the Indian board of education or the IGCSE / IB. STEM oriented students, aspiring to go to the USA for their undergraduation, is a big mass in India! Sensing this, we tapped two of the biggest student counselling companies in India and spoke to their top notch counsellors about the importance of FIRST programs and its impact in profile building for these students. In two of their events, we were successful in passing this same message to 60+ counsellors, 400+ students and 550+ parents in this season.

## THE RED PEN - SUMMER FARE - 13TH JANUARY 2024

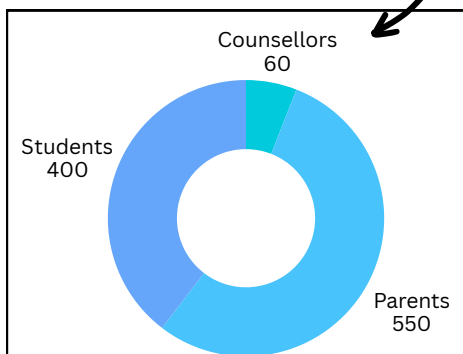
The Red Pen caters to 1200+ high school students in Mumbai each year. During their summer fare, we had our FRC Sigma stall, where we showcased our FRC Chassis and promoted benefits of participating in FRC competition. To our surprise, one member, Utkarsh Jain, whom we met at the fare with his parents, decided on the spot to join the team! Many counsellors at the red pen were intrigued by our robot and benefits of FIRST for skill building of a high school student. We look forward for our continued association with them.



## ONCOURSE VANTAGE - SUMMER FAIR - 4TH FEBRUARY 2024

This was our second consecutive season with our stall at Oncourse's summer fare. Here, we promoted FRC and FTC both equivalently. We also took our FTC Team Sigma's fully functional robot for the showcase. We were able to interact with a close to 100 students, 160 parents and 35+ educational counsellors during this summer fare. We also spoke to the cofounder of oncourse and got a verbal commitment for Oncourse's own FTC team in 24-25 season!

### VARIETY OF AUDIENCE INTERACTED WITH



# Robotics Outreach - One Residential Society at a Time



We have been taking prominent efforts to uplift the underserved community through “Build your FIRST robot” initiative. In order to grow FIRST in India, it is important to reach out to all the sections of the society. Through our housing society activation program, we go to the residential societies where affluent parents and kids live! Through our unique robotics games during their Christmas carnivals, we engage with them and educate them about the benefits of participating in FIRST competitions, all while kickstarting to learn robotics at young age! Our FRC and FTC robot showcase always works wonder!

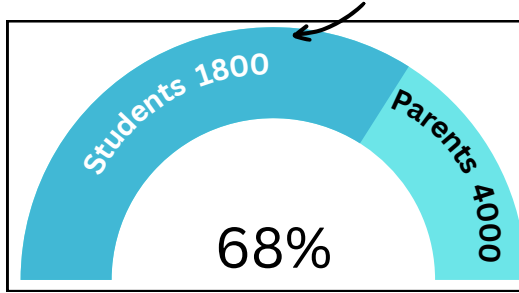
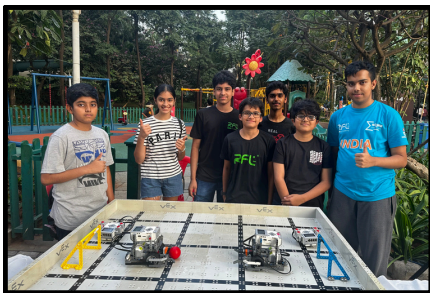
## OBEROI SPLENDOUR - DATE: 23 DEC 23'

**AUDIENCE IMPACTED: 4000**

- This plush, upscaled housing society consist of 1296 apartments, housing close to 4000 people, including approx. 1000 children aged 6 to 18 years.
- During their Xmas carnival, we promoted the importance of participating in *FIRST* programs by showcasing a functional robot, all while allowing them to play a game soccer with our unique EV3 soccer bots.
- Many parents and students showed keen interest in starting to learn robotics and eventually participate in *FIRST* competitions in near future.



### AUDIENCE INTERACTED WITH



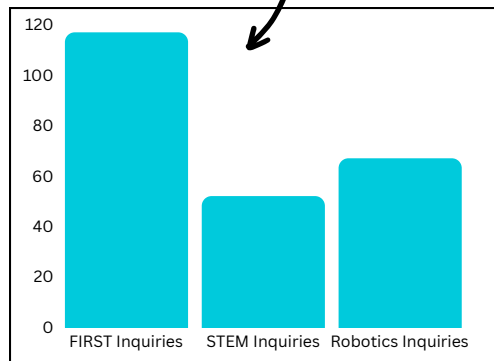
## RAHEJA VIVERIA - DATE: 3 DEC 23'

**AUDIENCE IMPACTED: 3000**

- This ultra luxurious housing society consists of 968 apartments, housing close to 3000 people, including approximately 800 children aged 6 to 18 years.
- We replicated the same model as Oberoi Splendour and it worked wonders, once again!
- Great traction, accompanied with the hunger to learn, encouraged us to think more for this initiative. We were amazed to see inquisitiveness in robotics from young minds and their parents alike.



### QUESTIONS ABOUT FIRST





## WHY SCHOOLS?

It is important to educate the stakeholders at the school about the importance of robotics education for school students and encourage them to start their own **FIRST** teams. This will allow us to grow **FIRST** in India in the most sustainable manner. With this in mind, we participated in the annual festival of two of the most prominent schools in our vicinity - Anand Mela at Jamna Bai Narsee School (JNS) and Enterpriser Day at R.N.Shah International School (RNSIS)

### JNS ANAND MELA (22 JAN '24)

- It is the biggest school in Mumbai, teaching 12,000 students per year across Pre K to Grade 12.
- 3 JNS students from our team secured a stall and put up an interactive robo soccer game stall in this Anand Mela. It was a huge hit, allowing us to interact with 3000+ parents, 4000+ students and 300+ teachers along with 5 decision makers of the school.
- They showed keen interest in promoting robotics as an in-school curriculum for their middle and high school students.
- They are extremely positive to kickstart their own **FIRST** competition teams in the upcoming academic year.

### R.N.SHAH INTERNATIONAL SCHOOL SCIENCE FEST (9TH MAR '24)

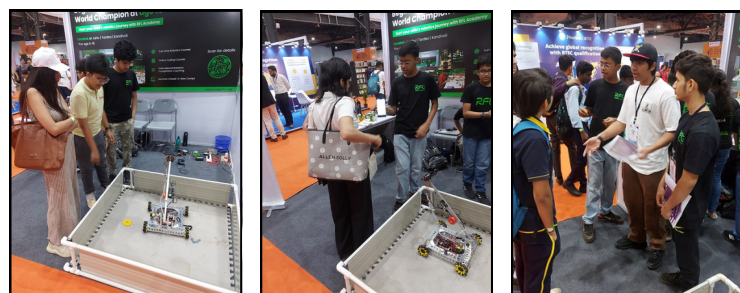
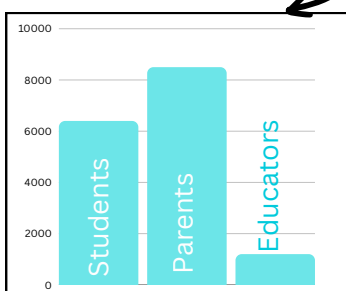
- This school caters to 3500 students per year across Pre K to Grade 12. They have recently launched classes in the international curriculum.
- During their enterprise day, we setup an interactive and attractive robotics stall to promote the benefits of participating in **FIRST** competitions.
- 400+ students and parents in the entire day played with our robo soccer game and understood how FTC robot works.



### NESCO EDUCATION FAIR

- This is one of the most promising educational fare for school's stake holders, parents and students as they get to see new learning platforms and technologies for the school students.
- With our interactive robotics stall for the 3 days of this fare, we were able to interact with 2000+ students, 4000+ parents and 1000+ educators about robotics, FIRST and our growth with it. We are sure to have inspired them to kickstart their journey in robotics either through or beyond!

### OVERALL IMPACT







Gracious professionalism has been a part of Sigma's motto since Day 1, and we leave no stone unturned to ensure that every FIRST team in our community receives the help they need in any competition aspect. Being rookies in FRC does not hold us back from starting and mentoring other FIRST teams in other programs. In this FRC Crescendo season, we have started 2 new FTC teams and recruited all 13 rookie FTC team members in our FTC team Sigma, all while hand holding for mentoring these 3 teams.

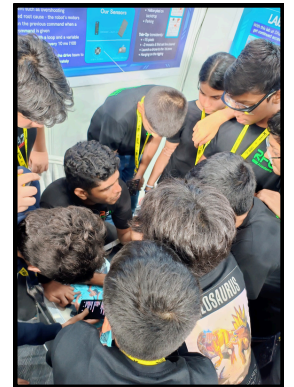
## FTC TEAM SIGMA #20890

When we graduated to FRC Team Sigma, we promised ourselves to not let FTC Sigma die. We recruited 13 rookie members in the team, most from grades 7 and 8 and hand held them with all the processes of FTC competition for 5 full months!

- Firstly, we helped in the recruitment of their members by conducting interviews and carrying out SWOT analysis.
- 50+ hours with their Skill Building
- 25+ hours with the construction aspect of FTC
- 10+ hours with programming
- 5+ hours with drive practice
- 10+ hours in documentation

### Awards:

- Sigma clinched Think Award second place in FTC nationals. They are now preparing for the Asia Pacific Open Championship, Sydney!
- They were the robot game semi finalists too!
- Saisha Arora went on to win the Jr. Dean's List Award in the national chapter.



## FTC TEAM OMEGA #24902

After our persistent efforts, finally one of the leading IB schools of Mumbai, Dhirubhai Ambani International School, agreed to start their own FIRST Tech Challenge Team. We did a complete hand holding of this team across all fronts.

- 20+ hours in Skill Building
- 5+ hours in Construction
- 5+ hours in Programming
- 5+ hours in Documentation

Team Omega went on to raise Rs. 5,00,000/- from corporates, through which, they sponsored 10 teams from underprivileged background to participate in India's biggest robotics and coding competition - Codeavour 5.0!





## FTC TEAM METAL MAVERICKS #24905

In our pursuit to promote FTC competition across diverse spectrum of audience, we convinced India's leading undergrad career counselling company - Athena Education, to start their own FTC team! 7 high school students from Athena Education formed "Metal Mavericks" in October 2023. Since then, we -

1. Guided them through their PTC OnShape course for 10 hours.
2. FIRST blocks programming for 4 hours.
3. Documentation and pit decoration tips for 3 hours.
4. Driver selection process.
5. Robot design inputs and enabling them to 3D print materials to put it on robot.
6. Presentation practice and Dean's list QA.

### AWARDS:

- Metal Mavericks clinched Innovate Award 2nd place in FTC India national championship.



## FTC TEAM GOATRONICS #24991

Our hunting for FTC teams beyond Mumbai found a new stop, Goa! We conducted 6 hours of rigorous online sessions with FTC Team Goatronics, where, we covered the following -

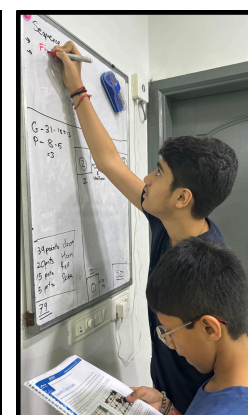
1. Helped them to identify right set of parts to procure from Rev and GoBilda.
2. Gave them important sessions on CAD and coding.
3. Gave them insights on driver selection process and documentation.



## VEX IQ ROBOTICS COMPETITION

Few members in our team have a prior VEXIQ experience. With this, we started and mentored two VEX IQ teams in the absence of FLL Challenge competition in India. These two teams - Sigma and Hydra. We provided construction, coding, and engineering notebook guidance. Both teams showed enthusiasm and dedication. We look forward to seeing their continued success in the robotics world!

- 20+ hours in Construction
- 25+ hours in Programming
- 15+ hours in Engineering notebook

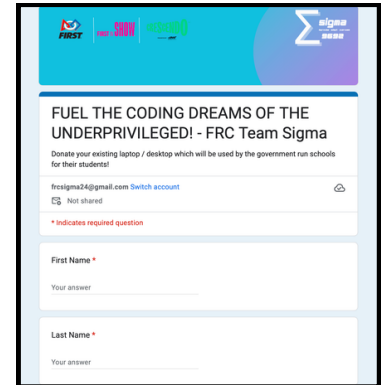


# Laptop Donation Drive

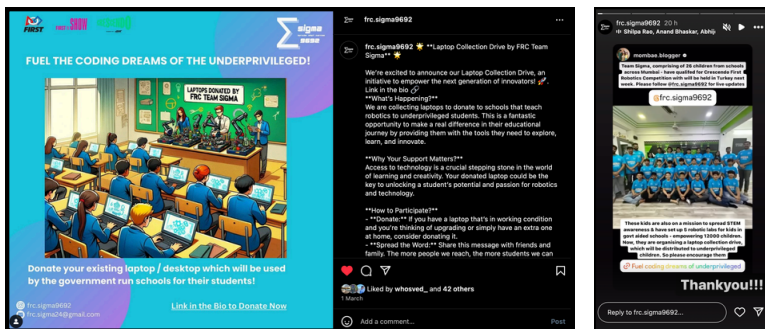
E-waste presents a significant challenge for nations on a daily basis. As a robotics team, our mission is to mitigate the impact of e-waste and uplift communities through targeted outreach efforts. One such initiative involves organizing laptop donation drives. By collecting and redistributing laptops, we not only reduce e-waste but also empower individuals within the community by providing them with access to technology and opportunities for education and personal development.

Process of the donation drive:

1. Developing a Google Form to gather contact details and assess the condition of donated laptops.
2. Sharing the Google Form link across various networks, including family, friends, and corporate contacts, leveraging social media platforms.
3. Receiving donated laptops at our lab and distributing them to underserved individuals at the robotics labs we had set up in government schools and organisations.

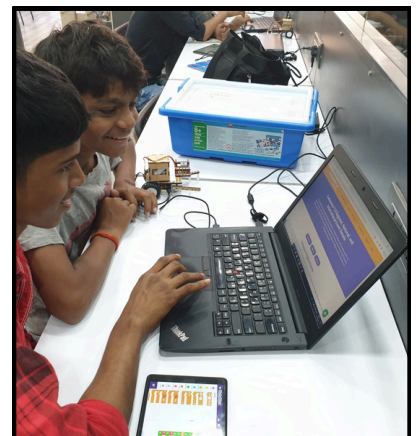
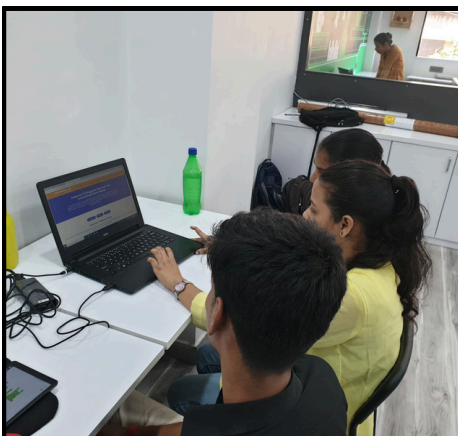


To reach our goal of collecting and distributing laptops, we collaborated with an Instagram influencer with a fan following of 140,000. She liked our idea very much and published an Instagram post, along with the google form we generated for the laptop collection.



[https://docs.google.com/forms/d/e/1FAIpQLSdEdGNW5yLyHMyuXa1LjwBnWpNvE7s\\_few5XPaTPgL1pKEFa/viewform](https://docs.google.com/forms/d/e/1FAIpQLSdEdGNW5yLyHMyuXa1LjwBnWpNvE7s_few5XPaTPgL1pKEFa/viewform)

Thanks to our diligent efforts, we were able to collect 7 laptops and distribute them to underserved children who are participating in a renowned coding competition, Codeavour 5.0. These children are currently being coached by our mentors and are utilising these laptops for skill-building and to progress in the competition.





## IMPORTANCE OF ENGINEERING CONNECT

- We believe that competitions like FIRST Robotics Competition encourages us to delve deep into the core engineering topics and apply the same to build and code our own robot.
- In sync with this, we also believe that we can learn a lot in short span of time when we interact with prominent engineers across.
- In this quest, we were able to connect with 2 prominent engineers and attend a great engineering conclave in this 2023-24 FRC season!
- These three events have given a better understanding about the current engineering trends along with its practical application and what the future holds for us!

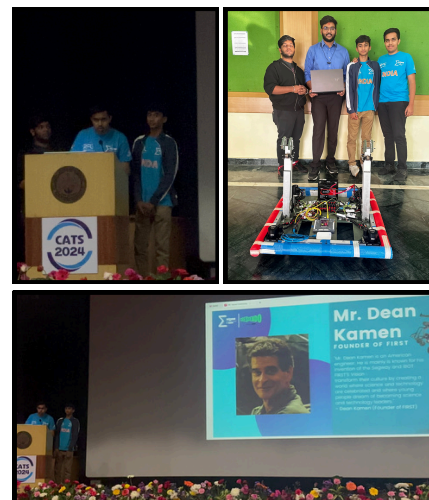
### MR. SONAM WANGCHUCK - SECMOL FOUNDER - 5 JAN '24

- He is better known to the Indian community as the infamous 'Rancho', an engineer, innovator and education reformist.
- He emphasised on the fact that we must translate our learnings from FIRST Robotics Competition to design an innovative robot for one of the many social problems that India is facing at the moment.



### CATS - CONCLAVE ON AUTONOMOUS TECH. & SYSTEMS - 12TH JAN '24

- This conclave was hosted with the gracious invitation of Dr. Alok Mukherjee, Head of Robotics at DRDO, most prominent defence research organisation of India.
- Renowned voices from Rigbeetal labs, ISRO, BARC, CDAC, CSIR, NIO, and NIOT shared insights on India's standing in Robotics and AI, particularly in defence.
- We delivered an empowering short speech on importance of robotics learning for school students and how FIRST plays an important role in this process to 300+ prominent engineers of India.
- We invited these engineers to wear a hat of part time mentor and promote robotics in their localities!



### MR. ANKUR KOTHARI - AUTOMATION ANYWHERE - 22 DEC '23

- Mr. Ankur Kothari is a Co-Founder of a cloud automation platform that empowers businesses across industries with RPA, AI, Analytics to streamline processes and drive innovation.
- He emphasised on the fact that we must enjoy the process and grow with the program. We must just treat the results as an outcome of the season, learn from it and move on!



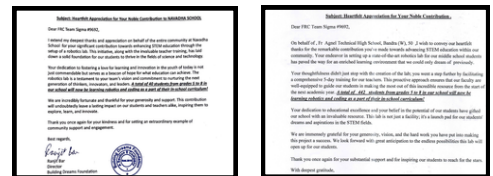
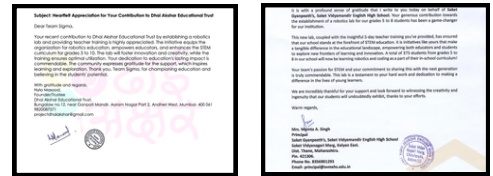
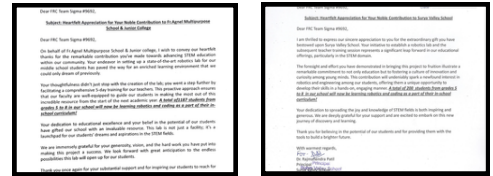
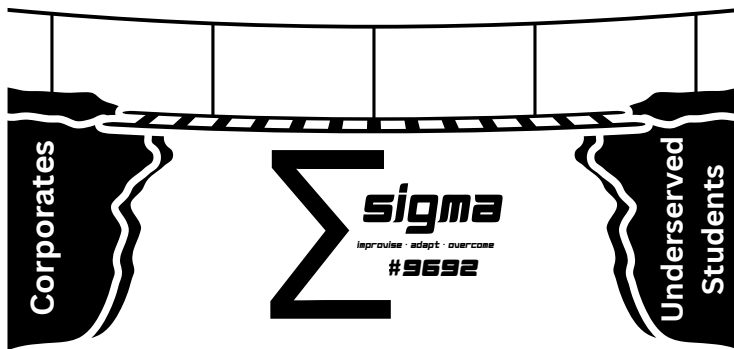
### RECRUITING ENGINEERING COACHES FOR TEAM - 12 OCT '23

- We believe that it is important to empower the engineering students and show them potential career opportunities with robotics coaching as a profession.
- In this pursuit, our coaches conducted a recruitment drive in R.K. University and recruited both our coding coaches, while they were just finishing their 7th semester.
- Our coding team would not have been as empowered as they are, now, in presence of our coding mentors!



## CONNECTING CORPORATES TO THE UNDERSERVED

After conducting the “Build and Code your FIRST Robot” workshops across underserved schools, the most prominent follow up question from them was “What Next? Our kids loved robotics and they want more!”. In a quest to satisfactorily answer this question, we designed a unique bridge - connecting the corporates to the underserved school students, only for robotics and coding! We have got an overwhelming response to this initiative since its inception! This year itself, we have setup 5 robotics labs across the city of Mumbai, allowing 2500+ students to learn robotics and coding in fun and hands on way as a part of their in-school curriculum.



We followed a specific process to setup a robotics lab for the underserved schools. This allowed us to scale our initiative with a growing traction from the corporates.



Sr. No.	Product	Quantity	Image
1	Quarky AI and Robotics Ultimate Kit	12	
2	Pictoblox AI Software License with LMS	20	
3	3D Printer	01	

The above 3 items, with a 5-day comprehensive teacher training program, costs **INR 2 lakhs (₹ 77,387)**. On top of this, we also assure the beneficiary school of continuous monthly support from us and our mentors.



## HOW DID WE REACH OUT TO THE CORPORATES?

We followed a systematic approach to reach out to the corporates and seek their appointment. The following things worked for us -

1. Cold Emails to the corporates with consistent follow-up.
2. Networking through parent connects.

We designed a dedicated presentation and an elevator pitch for these fundraising meetings - focusing on important aspects of the FIRST competition and why should a corporation sponsor our initiative.

This year, we pitched to a total of 8 corporates, of which, we were successful in convincing 6 of them to fund us! 2500+ students across 5 robotics labs will benefit from continued robotics learning in robotics labs, established through these funds! We are indebted to our corporate partners to fuel the dreams of thousands of underserved school students!

### **G.M MODULAR LTD. | MR. JAYANT JAIN |**

#### **CHAIRMAN**

- G.M. is one of the biggest manufacturer of switches and switch boards in India.
- They appreciated our robotics accomplishments and our mission for the underserved.

### **APPRECIATE WEALTH MANAGEMENT |**

#### **MR. SUBHO MOULIK | CEO**

- One of the biggest wealth management companies in India.
- He pushed our imagination and asked us to work on a plan to start and run 10000 such robotics labs for the underserved.

### **DALMIA CEMENTS | MR. MAHENDRA SINGHI |**

#### **CEO**

- It is one of the finest cement manufacturers of India.
- It was a telephonic pitch for us. He was impressed with our confidence and immediately said yes for the support!

### **KAPRI CORP | MR. ROHAN DASADIA |**

#### **M.D.**

- Leading suppliers of hi-tech surveillance systems in India.
- They liked our “Build your FIRST robot initiative” and were all praises for our community upliftment efforts.

### **YES BANK | MR. NIPUN JAIN | CMO**

- Youngest yet leading banks in India.
- Aggressive promoter of tech startup.
- CMO was awestruck with our robot. He said Yes Bank is intending to be our title sponsor from the next FRC season.

### **SHARAD SANGHI | FOUNDER | NETMAGIC**

- He is at the forefront of data centres in India.
- He thoroughly appreciated our future goals and our solid plans to sustain the robotics labs for the underserved.

### **NEELYOG BUILDERS | RUSHI MEHTA | CEO**

- They are one of the most reputed builders of Mumbai.
- Mr. Rushi gave valuable insights on how we can add an element of coaching on yearly basis for these labs to make them successful over the period of time.

### **SAFEX FIRE SERVICES LTD. | TEJAS SHAH | CEO**

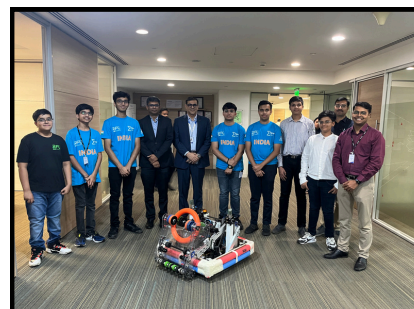
- They are leading fire safety equipment manufacturers.
- They gave great emphasis on starting such robotics labs for the students living and learning in the remote areas of India

Through these fund raising meetings, we gained a lot of life skills like presentation, prompt QA, confidence building, etc. We gained great insights on what corporates across categories think like, specifically for utilising their funds for such initiatives. As Sigma, we are glad that we promoted FIRST and its ethos to such corporates, hoping for them to spread the word and encourage more people in their community and their fellow corporates to raise the awareness, penetration and adaption of robotics and coding for all the sections of the society in the near future!



All these efforts yielded great fruits! 6 of these corporates funded our vision and initiative!

Sr. No.	Corporate	Funds Raised (INR   TL)	Robotics Labs Funded For
1		4,00,000   1,54,774	Father Agnel School Bandra   Father Agnel School Ambernath
2		2,00,000   77,387	Saketh Vidhya Mandir, Kalyan
3		2,00,000   77,387	Surya Valley School, Palghar
4		2,00,000   77,387	Navadha Schools, West Bengal
5		2,00,000   77,387	Shree Gaurvidutt Mittal Vidhyalaya & Jr. College
6		1,00,000   38,693	3D printers for all of the above schools
<b>Total Sponsorship</b>		<b>13,00,000   6,50,000</b>	





Imagine transforming a classroom into a hub of creativity! FRC Team Sigma 9692 makes it a reality with our Lab Setup Program. We equip underserved schools with robotics kits, igniting a passion for STEM in young minds. These kits aren't just toys - they're gateways to a world of possibility. Students collaborate, build, and program robots, sharpening their problem-solving skills and critical thinking. It's not just about robots; it's about empowering the next generation of innovators, one kit at a time. Join us in building a future filled with limitless potential!

Through the funds raised from corporates, we setup the following in the beneficiary school -

1. Robotics lab - with enough equipments to teach 30 students at a time.
2. Donate a laptop if they do not have a computer lab.
3. Provide collaterals - ensuring proper ambience for learning robotics.
4. 5 days teacher training program
5. Grade wise curriculum for effective implementation | One zoom session per month for doubt.

## FATHER AGNELS HIGH SCHOOL

**CONTINUOUS ROBOTICS LEARNING: 442 STUDENTS**

- Located in Bandra, Mumbai, this school caters to the students coming from lower middle class background.
- School has it's own computer lab, where we have setup their robotics lab as well, now!



## FATHER AGNEL SCHOOL

**CONTINUOUS ROBOTICS LEARNING: 1187 STUDENTS**

- Located in Ambarnath, Mumbai, this school caters to students coming from poor financial backgrounds.
- Not just 1 but all their teachers wanted to take robotics training, ensuring effective implementation!



## SURYAVALLEY SCHOOL

**CONTINUOUS ROBOTICS LEARNING: 200 STUDENTS**

- Located in Palghar, Mumbai, we have met the most enthusiastic and energetic trustee of the school.
- He has assured us that their execution of our robotics lab will be two steps better than any other setups done by us!



## SAKET VIDYA MANDIR

**CONTINUOUS ROBOTICS LEARNING: 373 STUDENTS**

- Our robotics lab setup enabled this school to become first ever in their vicinity to have their own robotics lab.
- Trustee has assured open access to the deserving students within the vicinity.



## NAVADHA SCHOOL

**CONTINUOUS ROBOTICS LEARNING: 40 STUDENTS**

- We conducted an online coding workshop with the students of this school, who sit 4000 km away from Mumbai.
- Their hunger for robotics inspired us to set up a lab there.



## DHAI AKSHAR FOUNDATION

**CONTINUOUS ROBOTICS LEARNING: 80 STUDENTS**

- One one of the most boutique and efficient NGO's in the city of Mumbai.
- Caters to only 80, but the most interested high school students for various vocational programs.





As a rookie team from India, we always wanted to ensure the most efficient use of funds for our entire preparations. In India, corporates happily fund initiatives for the upliftment of the underserved but are hesitant to fund us for our FRC preparations. All our financial investment have come from our parents in this season. Here is what our income and expenses look like.

## INCOME

Sr. No.	Particulars	Amount (INR)
1	Investment from our parents	50,00,000/-
2	Sponsorship from Corporates	13,00,000/-
Total Income		63,00,000/-

## EXPENSES

Sr. No.	Particulars	Amount (INR)
1	Robotics kits procurement from USA	20,00,000/-
2	Trip to USA for bringing the robotics parts	2,00,000/-
3	Import duty	5,50,000/-
4	Registration fees for two regional events	7,47,000/-
5	Trip to Turkey for KoP and Game Elements	1,20,000/-
6	Rent for the workstation for 6 months	6,13,000/-
7	Power Tools - CNC, Mitre Saw, Grinder, Drill Press, etc.	5,70,000/-
8	Tshirts and Hoodies	1,00,000/-
9	Resources and stalls for outreach activities	1,00,000/-
10	Robotics Lab Setup in 6 schools	13,00,000/-
Total		63,00,000/-



On the top of this, our parents have funded our travel for this trip. We look forward to grow an ecosystem in India where corporates will excitedly come forward and sponsor us on different fronts and encourage many more students to be a part of FIRST Robotics Competition.

## TRAVEL EXPENSES PER STUDENT

Sr. No.	Particulars	Amount (INR)
1	Visa	22,000/-
2	Flight tickets	46,000/-
3	Accommodation	35,000/-
4	Food and Misc. for 10 days	25,000/-
5	Our coach's travel share	22,000/-
6	Bus for airport and internal transfers	23,000/-
Total Travel Expense Per Student		1,73,000/-
Total Travel Expense Per Team		44,98,000/-

We are expecting to bring down our operational costs from the next season, considering the sizeable investment in the procurement of the robot parts! If we review our expenses in the business terms, this is what it looks like -

Sr. No.	Particulars	Amount (INR)
1	Fixed Costs - Rent, Reg. Fees, Outreach, Merch.	15,60,000/-
2	Variable Costs	14,40,000/-
3	Assets	20,00,000/-


In the upcoming season, we will pitch to the corporate to sponsor us a big space for 6 months where we can work through our FRC seasons, allowing them to be our Venue Sponsor! This can bring our fixed costs down by close to 40%!



We believe in the power of social media. We are gradually building a strong presence on Instagram through our informative and fun-based reels and posts! Coming from the city of Mumbai - home to all the renowned Bollywood actors, we tried to leverage their presence and promote awareness about FIRST robotics competitions across the strata of society all across the nation!

Through our informative reels, we have engaged with 20000+ people on Instagram in just 6 months. After reaching out to close to a 50 celebrities and social influencers, 11 celebrities posted about us, our achievements and FIRST in totality on their social media handles! It means a lot to us, since these are the faces that India sees on daily basis and when the message comes from them, we are sure everyone will take FIRST and robotics in general more seriously not just across Mumbai but across India! Through these reels, we have reached out to over 50,000+ people in no time.

## INFORMATIVE CONTENT ON OUR INSTAGRAM ACCOUNT



**frc.sigma9692** Following Message


34 posts 320 followers 48 following

FRC #9692 Team Sigma  
Rookie FRC team!  
[linktr.ee/sigma9692](https://linktr.ee/sigma9692)

**12,945**  
Accounts reached

+59.3% Followers  
240

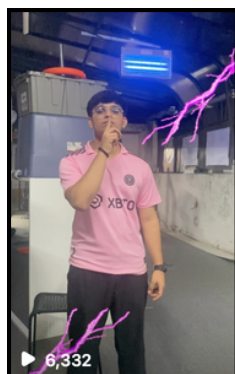
+610% Non-followers  
12.7K



@FRC.SIGMA9692



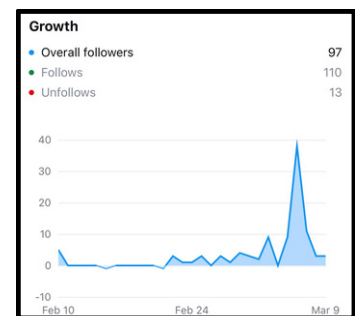
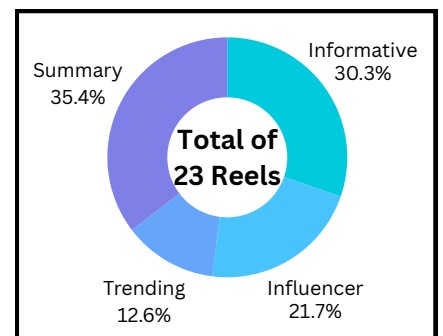
**BATTERY SAFETY**



**HUMAN PLAYER**



**PASCACK PIONEERS**



## FOLLOWER GROWTH

**571**  
Accounts engaged

+77% Followers  
168

+459% Non-followers  
403

## CELEBRITY SHOUTOUTS ON OUR INSTAGRAM ACCOUNT



**ranarushad**

Rushad Rana  
Actor

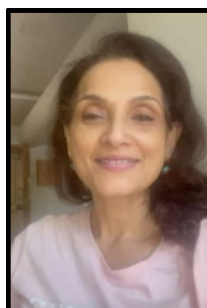
2,066 posts 304K followers 1,888 following



**gireesh\_sahdev**

Gireesh Sahdev  
@gireesh\_sahdev  
Actor

291 posts 130K followers 282 following



**rajeshwarisachdev**

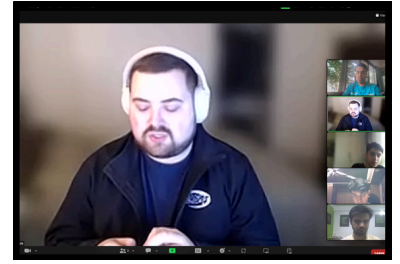
Rajeshwari Sachdev  
Actor  
Actor | Dancer | Singer

954 posts 107K followers 636 following



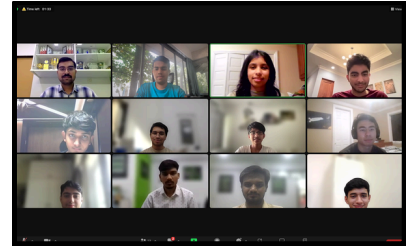
## TEAM 254 - THE CHEESY POOFS

- Team 254 has had unprecedented success in recent years. Both the team's membership and its sphere of influence have expanded.
- Our meet-up with Andrew Torrence gave us interesting insights into aspects unknown to a rookie team. They were also kind enough to guide us through the essential and helpful steps to take in the pre-season.



## TEAM 649 - MSET FISH

- Saratoga High School's MSET club, comprised of 39 students, aims to invent while upholding morality, courtesy, respect, inspiration, collaboration, enjoyment, and trial and error.
- After a thoughtful conversation, we became aware of many common errors that we might face and how to tackle them. We were also made aware of how to efficiently utilize our build season



## TEAM 1676 - THE PASCACK PI-ONEERS

- The Pascack Pi-oneers, FIRST Team 1676, promote STEM careers and provide STEM education. With 88 members, they dedicate 35 hours a week during Build Season, supported by coaches, mentors, and parents.
- Through their guidance, we learnt about the overlooked but important competition segments like how to impress the judges or even how to efficiently set up our robot pit. Additionally, we discussed the prospects of a future learning program in New Jersey.



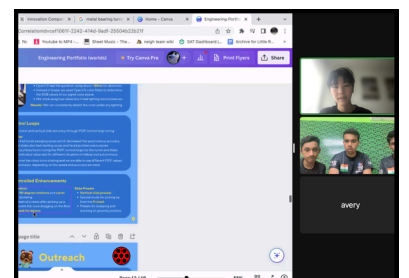
## TEAM 11 - MORT

- MORT 11 fosters STEM appreciation in students through partnerships with experienced mentors, outreach programs, and STEM principles, empowering future innovators and leaders.
- Our head coach, Ashwin sir, paid them a visit and gained multiple insights about how to use the CNC machines, how they efficiently balance 2 FRC teams simultaneously and gained some tips and tricks to make creative presentation ideas to market efficiently.



## TEAM 9647 - LADYBUG

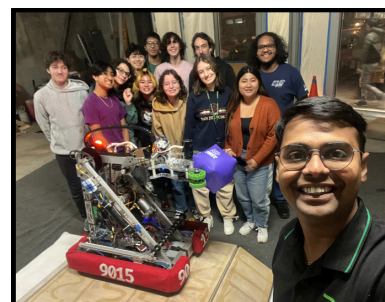
- With members from 16 different nations, team 9647, Ladybug, are Rookie All-Star Award Winning team from the Istanbul Regional 2024.
- This international team with its diversity provided interesting insights during our query-solving meeting about the Rookie All-Star Award.





## TEAM 9015 - QUESTIONABLE ENGINEERING

- Based in Jersey City, New Jersey, Questionable Engineering is a nonprofit community-based FIRST Robotics team. Students in Hudson County who are in high school and come from a variety of backgrounds and experiences make up the squad. The team's inaugural season saw them win ten honours.
- With their experience being a successful team with 10 honors, our team was informed about how best to talk to judges by representing ourselves well, and how to make a good impression in front of the judges.



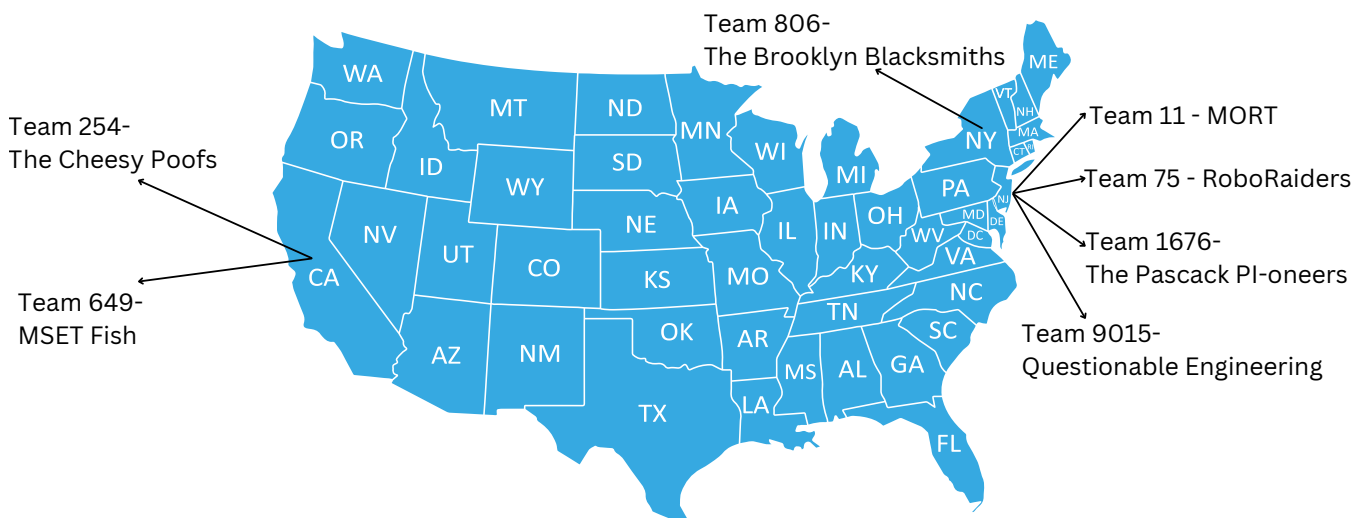
## TEAM 806 - THE BROOKLYN BLACKSMITHS

- Brooklyn Blacksmiths, a student-led FIRST Robotics Competition team since 2002, seeks to make STEM accessible for everyone. They are motivated to develop future STEM leaders.
- As they aspire to make STEM accessible to everyone, they have made a significant impact by donating a PDH to us which is something that might not seem like much to others but is a big help to us as an Indian team.



## TEAM 75 - ROBORAIDERS

- Participating in the annual FIRST Robotics Competition, Team 75 is an eclectic collection of mentors and students from Hillsborough High School that has won multiple accolades. They also start new teams, encourage community involvement, and build relationships.
- Robo Raiders being a creative team themselves helped us explore different ways to creatively plan and build our journey.





Being a rookie team, we aim to sustain our members and imprint a legacy into the FIRST community. Hence, we have derived a set of future goals we aim to achieve in the forthcoming FIRST seasons. These goals will ensure we strive to make an improvement in our quality and quantity of work. In addition, these goals will act like guidelines to sustaining the Indian and international robotics community.

2

### 1) Increasing the number of girls in the team

We want to promote #GirlsInSTEM in a sustainable manner. In the next season, we will put our efforts in this direction and aim to achieve the desired results.

0

### 2) Increasing the funds accumulated for community upliftment

We wish to increase our lab setup count from 6 to 20 in the upcoming season. For this, while we will up our efforts to conduct “Build your first robot” workshop and identify more schools in need of such robotics labs!

2

5

### 3) Giving continuity to already funded labs

We wish to start competition teams from the 6 labs in the upcoming season. Not just this, we wish to grow the number of robotics kits for these schools, based on their yearly performance.

2

### 1) International community upliftment

We aspire to start and mentor FIRST teams from the third-world country. Not just this, we also wish to grow this number in India manifold.

0

### 2) Building the most robust and functional robot

Considering our third season, we aim to design and code a world class robot, capable of competing with the champion teams from across the globe!

2

6

### 3) Giving a shot to the Impact Award

We want to work in an impactful manner for the upliftment of the underserved in India and beyond! With this, we aim to get our efforts recognised by FIRST in the form of an Impact Award.

2

### 1) Starting and Mentoring FRC teams in India

Considering that the FTC teams will mature over the period of years, we aim to start a couple of FRC teams in India, whom, we can hand hold for their off season as well as the build season and see them succeed.

0

### 2) Convincing corporates to fund us

By now, corporates would be well aware with what FRC Team Sigma does - both - for the upliftment of the community as well as for the robot game learning. We would love to see these corporates now funding us - team Sigma - for either our registration fees or robot cost, marking a new era for robotics teams in India.

2

7

### 3) See our senior pursue STEM in IVY Leagues

We aspire to see FRC Sigma Alumni pursue STEM courses in IVY League universities in the future and eventually giving back to FIRST in one or the other way!