ELEV8

FRC #7539

OUTREACH JOURNAL

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OUR OUTREACH PHILOSPHY

We seek to inspire the next generation of great minds by cultivating an appreciation of science, technology, engineering and math, breaking gender and class stereotypes, and bridging cultures to develop a united, technology-driven world.

VISION

We aspire to holistically prepare our team members to transform the community and become the leaders of tomorrow by building a self-sustainable society that inspires hands-on education focusing on STEM: Science, Technology, Engineering, and Math.

MISSION

Our mission is to ‘Build FIRST India’ - an Indian community of science & technology innovators, problem-solvers and leaders.

CORE VALUES

We aim to ingrain the values of Inclusion, Diversity, Sustainability and Impact in everyone we interact with.

FIRST OUTREACH - PROMOTING FIRST

FTC India Regional - Sponsored and Supported for the past 5 years

2022-23 -

- Sponsored and support the Regional
- Helped with organizing the event including - Scoring, setting up the match buzzer system and commentary
- Supported 30+ teams with technical requirements at our Robot Clinic

2021-22 :

- Associate Partner and sponsor for the regional
- Provided technical assistance to teams

2019-20 :

- Sponsored the FTC India Regional
- Assisted teams with technical issues through the competition

2018-2019 :

Sponsored the FTC India Regional and interacted with teams to spread awareness of FIRST values

Elev8 FTC Scrimmage - First ever Mock FTC-style Competition in India

Team Elev8 ran and hosted the **first FTC Scrimmage in India** at the Dhirubhai Ambani International School on 4th March 2023. The scrimmage saw spirited participation from FTC teams throughout Mumbai city, and consisted of 2 FTC teams from our school, DAIS, teams from other schools like the American School of Bombay, and multiple NGO teams that we at team Elev8 started and mentored. This event mimicked the style and structure of an actual FTC regional. Mr. Ashwin Sawant (Founder and CEO of InfinityX) was also present as our Chief Guest. He shared his feedback about the event and expressed his wishes to collaborate with team Elev8 in the future.

This scrimmage was a wonderful opportunity for FTC teams in the city to gain exposure to the world of FIRST competitions and practice for their upcoming regional in a competition setting. Moreover, they experienced the importance of gracious professionalism, collaboration and coopertition.

EXIT

Mentoring FIRST Teams - FTC

2022-23 -

Started 7 new FTC teams and mentored a total of 12 teams for the competition

In the 2022-23, we have continued to mentor teams we started in previous seasons, and started 7 new teams, including 2 with hearing-impaired students - Team Spark and Team Robo. We continued mentoring teams Matrix #20870 and Eureka #20871 from our school. We also continued mentoring NGO teams Abhyudaya #20873 and CuriousCity #20872. This year, one of our mentee teams won the Design Award (Matrix), the Innovate Award (Eureka), the division inspire award (CuriousCity), and the Rising Star Award (Team Spark)

ABHUDAYA

SPARK

INNOV8

AEONIAN LADIES FORCE

ROBOPALS

CYBORG

CURIOUS CITY

ATOM

ASTROBOT

MATRIX

EUREKA

PARADUCKS

In the 2021-22 season, we started and mentored 7 more FTC teams. We started and mentored FTC #20870 Matrix and FTC #20871 Eureka from DAIS. To achieve our mission of Building FIRST India, we also remotely mentored two teams, FTC #20878 Rickety Robots from The International School, Bangalore and FTC #20879 AlphaMetaRobotic from Inventure Academy Bangalore.

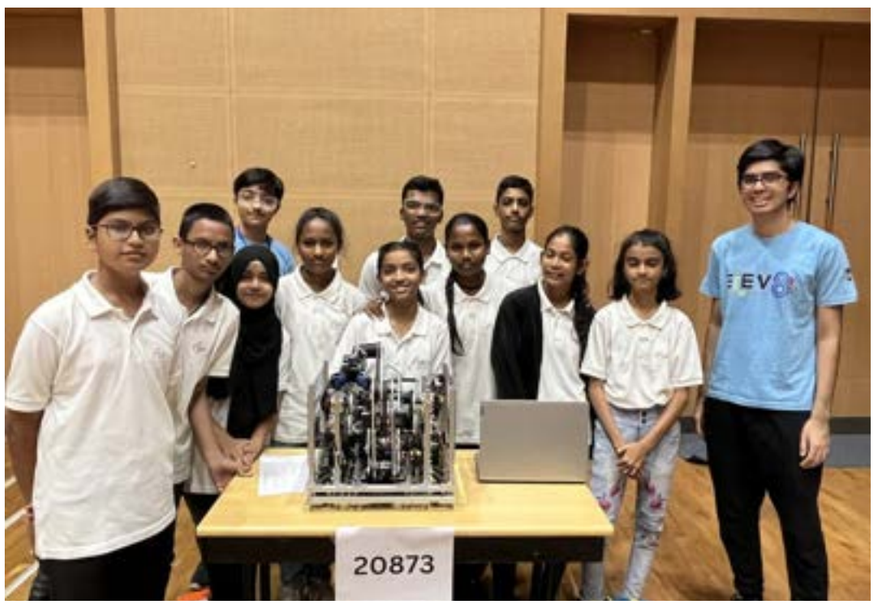
FTC #20871: Eureka

FTC #20870: Matrix

Elev8 has always been driven to inspire more and more girls to take part in STEM related activities, and one of our initiatives was to form two all-girl NGO FTC teams, Avsara and Abhyudaya.

Moreover, we aim to make the FIRST and robotics experience inclusive and accessible to all. To this effect, we have started and continue to mentor a total of 9 teams from underserved communities and NGOs. Additionally, we have also started 2 teams with hearing-impaired students at the local NGO Sankalp. In addition to mentorship, we have also provided funding to these teams for parts allowing them to access FTC resources.

FTC #20872: CuriousCity



FTC #20873: Abhyudaya

Furthermore, we mentored 8 more FTC teams, entirely in Hindi:

- FTC #19124 Chennai Robo Rockers
- FTC #19123 Robo Monarch
- FTC #19122 Robo Maverick
- FTC #18998 Akola Girls Team (All-Girls)
- FTC #18999 Akola GEMS
- FTC #18816 KITS Angels 1
- FTC #19011 KITS Angels 2
- FTC #19012 KITS Angels 3

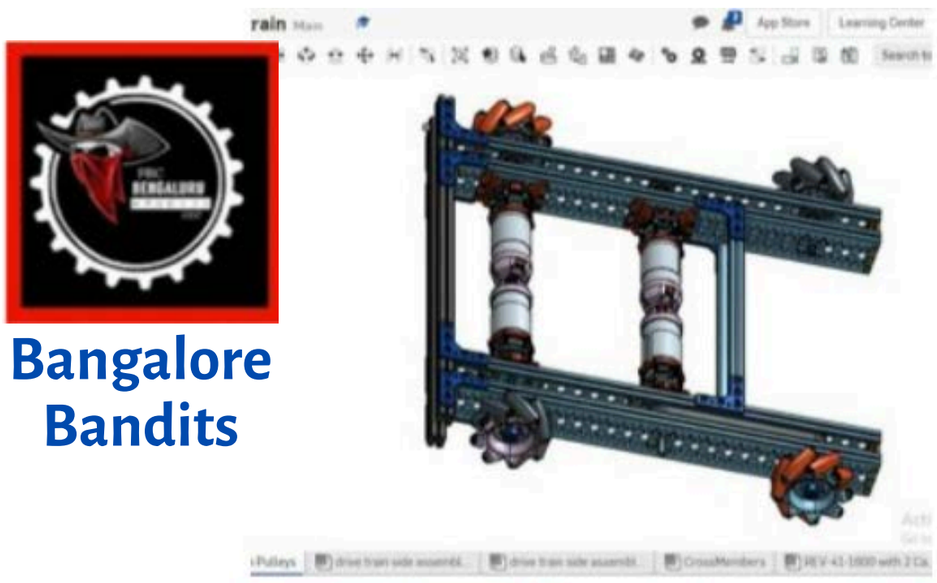
We conducted CAD sessions in Hindi specifically for them, and created a set of Programming, Construction and Outreach Manuals in Hindi for them to use. These students were extremely excited to learn and build their own robots. Seeing the spark in their eyes as they saw their robots moved, filled our hearts with joy.

Mentoring FIRST Teams - FRC

Being only the 3rd FRC team in the country, we wanted to expand the FRC network, with the aim of starting30 teams so that we can have an FRC Regional in India. Over the past two years, we have been able to start and mentor 6 FRC teams. These are:

- FRC #8597 Bangalore Bandits
- FRC #8570 Binary Bolts
- FRC #8582 Brave Solders
- FRC #8235 Beyond the Flames
- FRC #8268 Athena
- FRC #8540 Wall East

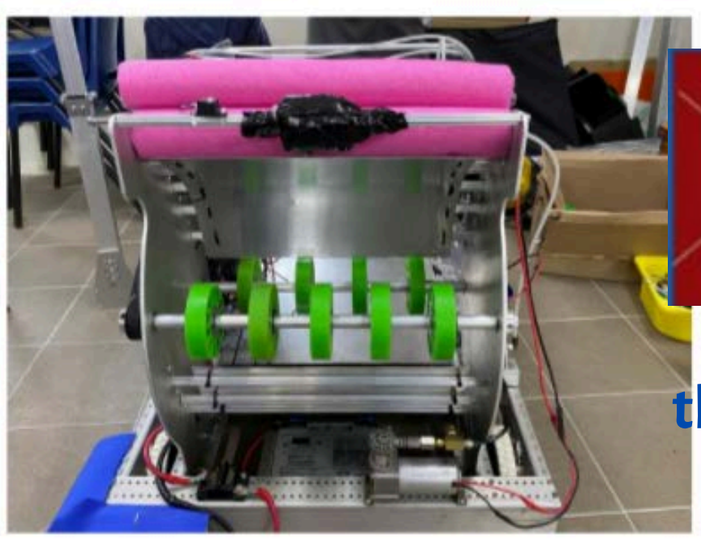
We conducted skill-building sessions for them as well as regular remote and physical mentoring sessions for the teams. We helped them through designing and building working robots for the challenge, and non-technical aspects of the competition such as outreach.



Bangalore Bandits

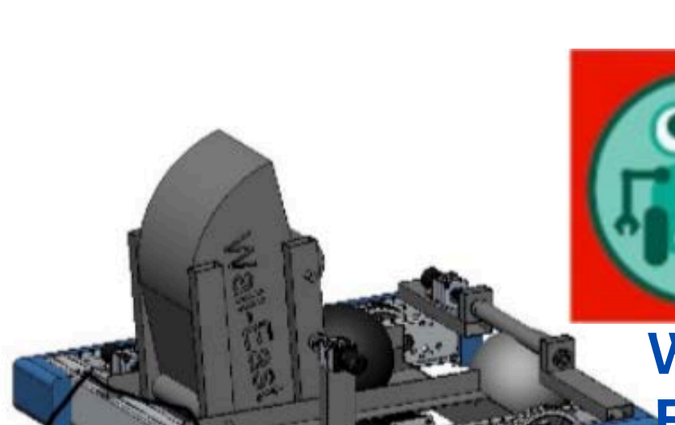
Brave Soldiers

Binary Bolts

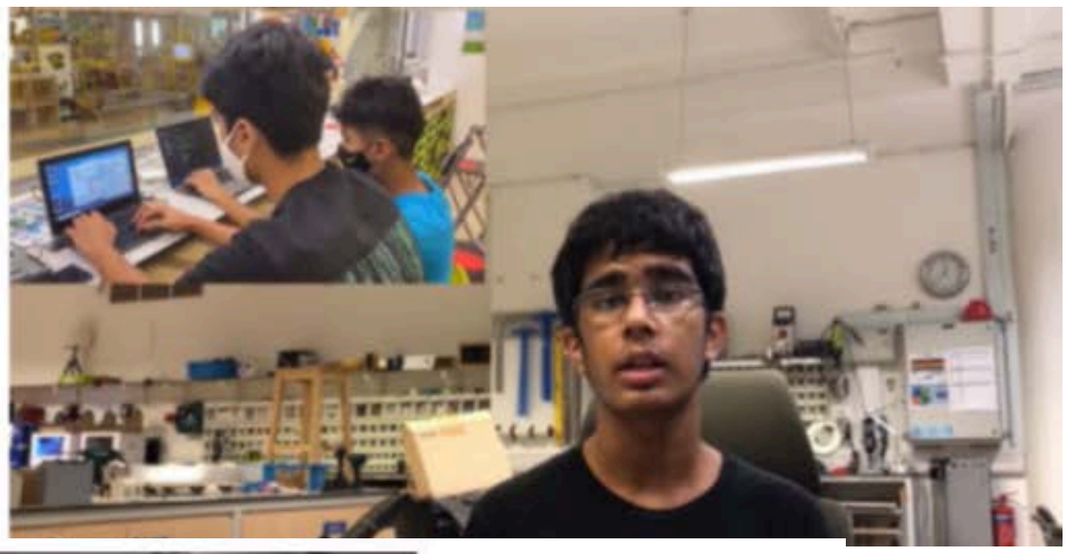


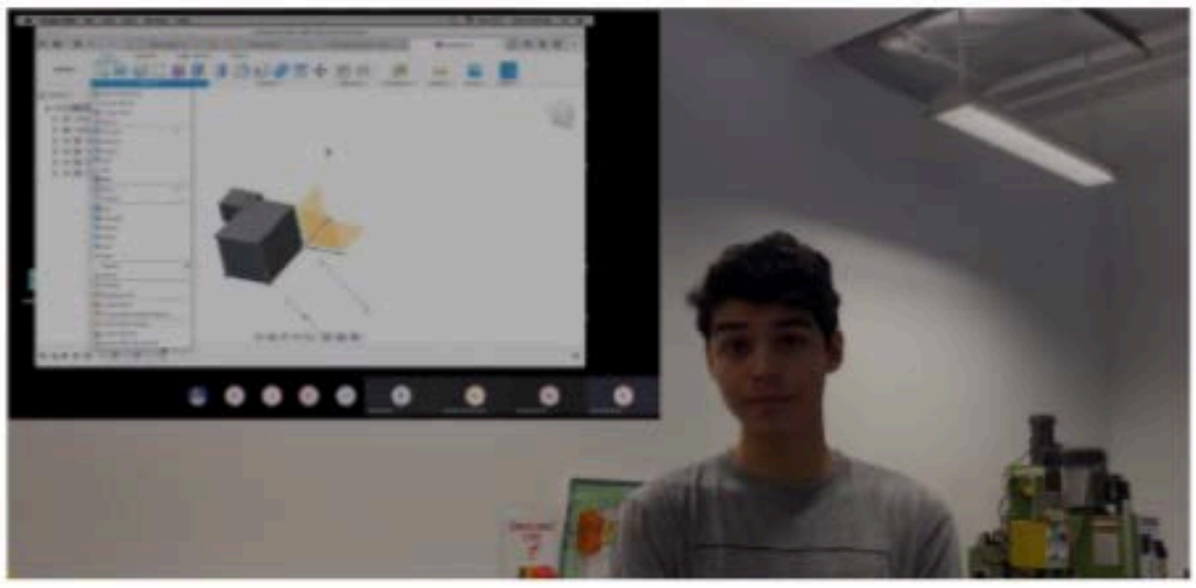
Beyond the Flames

Athena



Wall East



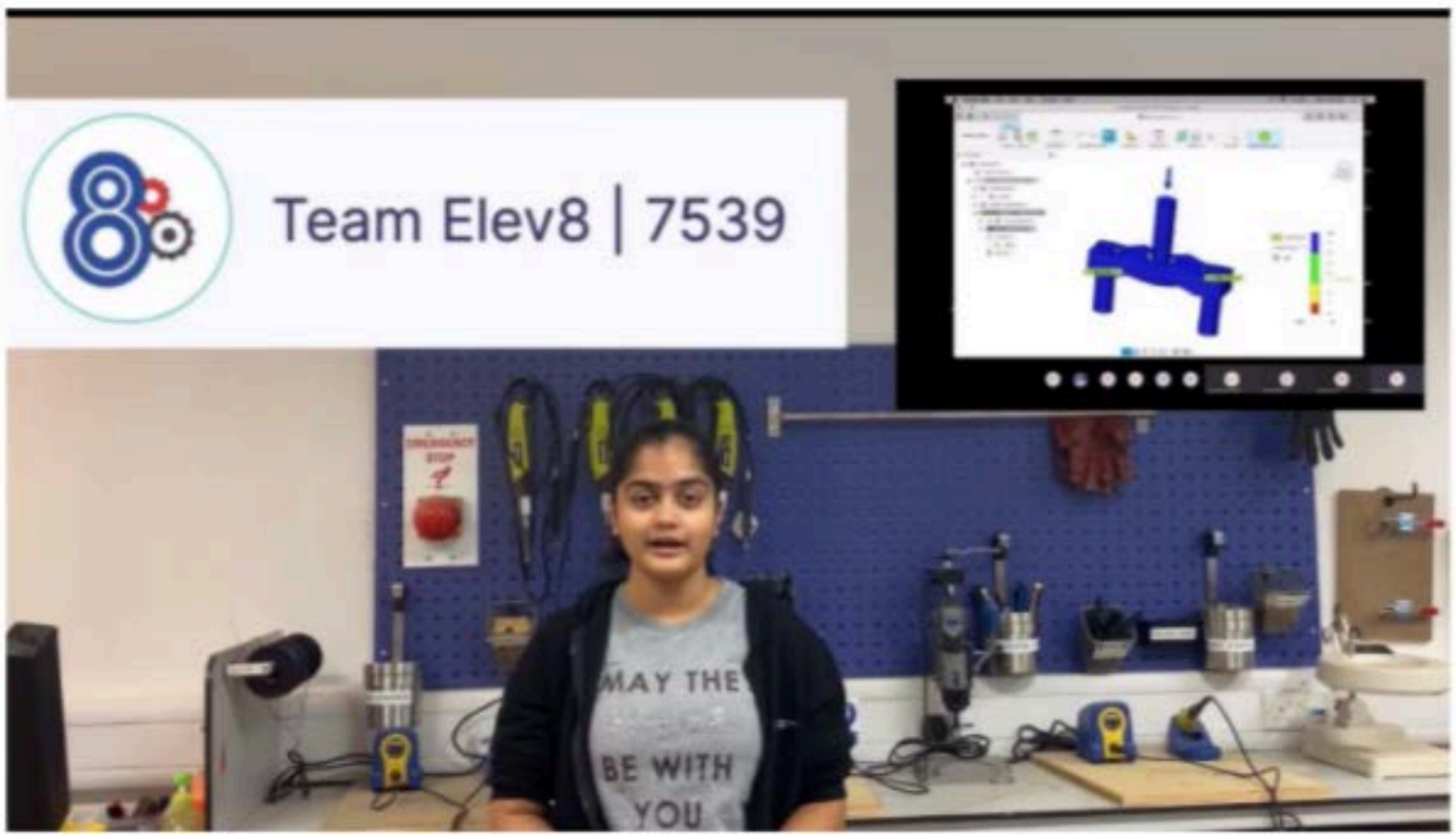


Thank you!

ELEV8
FRC #7539

frc_8235 • Following

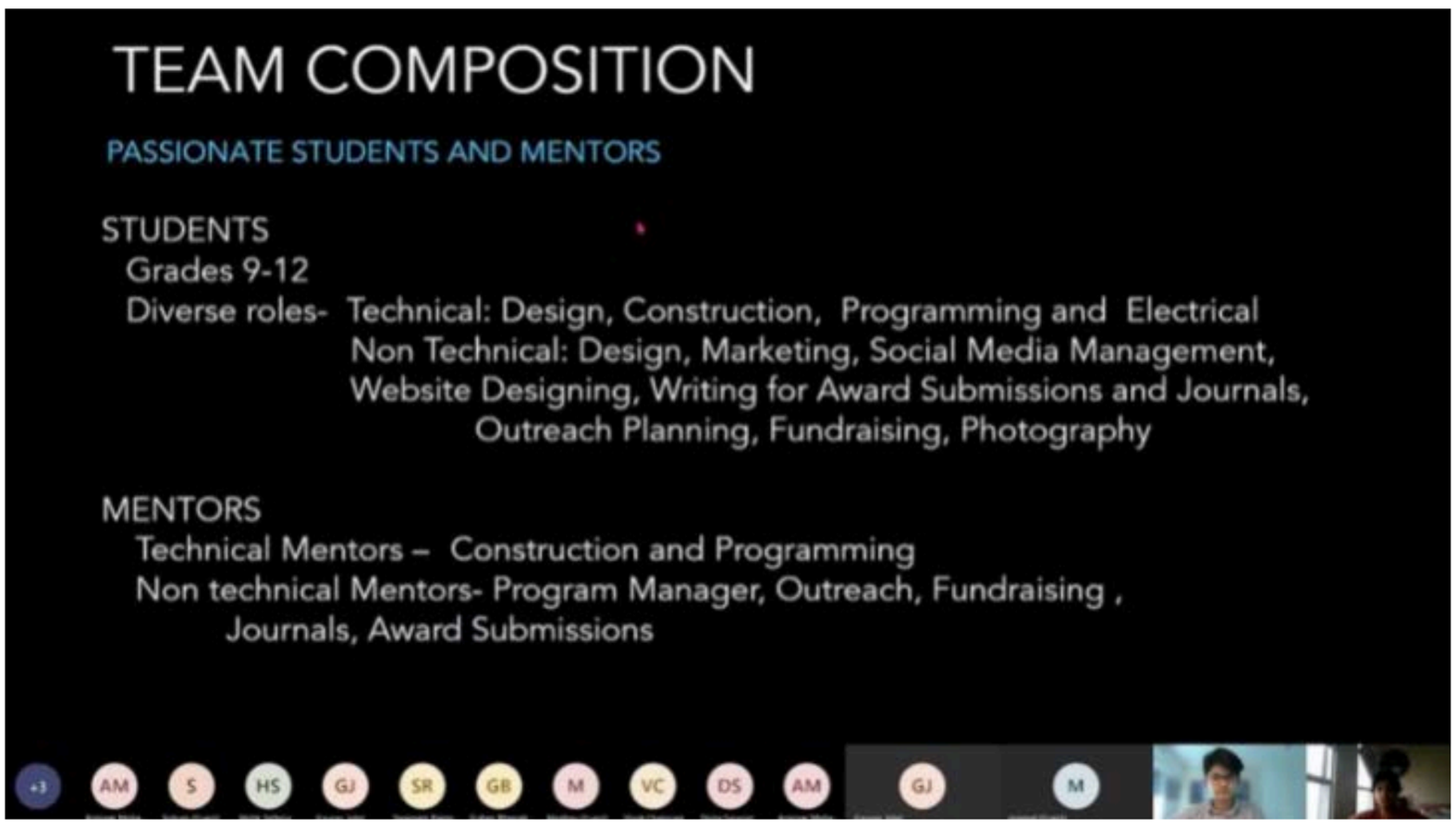
3. Team Elev8's mentors and students are always available on the phone for immediate clarifications regarding FRC.
4. During the Winter break, Elev8 hosted two of our team members in Mumbai and helped our team reach out to hearing impaired individuals to give them STEM exposure.
5. Team Elev8 had reviewed our original game strategy via video call and gave us valuable feedback. They helped us prioritise our mechanisms, and also shared with us their game strategy so that we could get an idea of what veteran teams were aiming for.
6. Their programming team provided us with programming resources to troubleshoot our programming issue.



FIRST Orientations

We conducted 17 FIRST orientations for schools, students and parents across India, to promote FIRST programs and Build India's FIRST community. Through this, we were able to reach out to 1000+ parents, mentors and students.

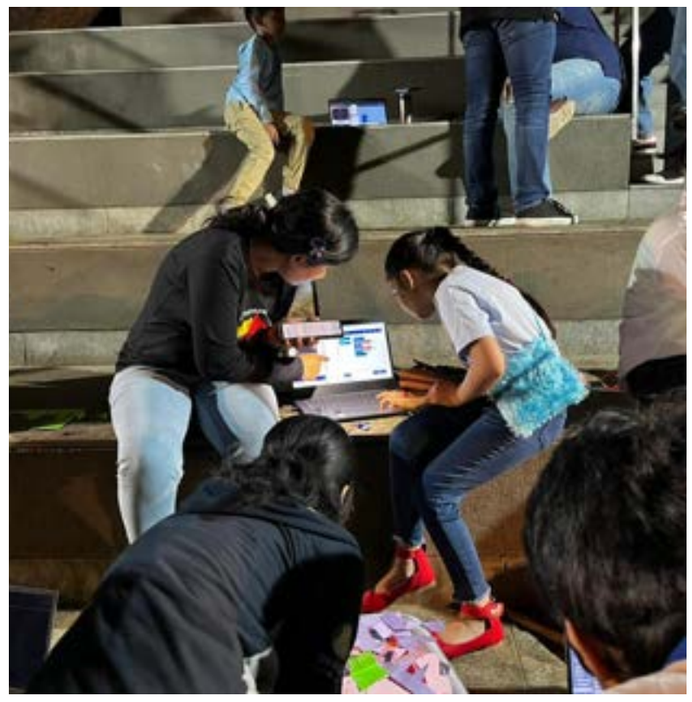
- Advocated FIRST to DAIS
- Advocated FIRST to UWC
- Advocated FIRST to NPS Singapore
- Advocated FIRST to TSRS
- Advocated FIRST to BIS
- Advocated FIRST to Rishikul
- Advocated FIRST to JNIS
- Advocated FIRST to Hillspring
- Advocated FIRST to several Delhi Schools, including Mother's international, Mayoor schools, Prakriti school, Vasant Valley School
- Advocated FIRST to Turkey school
- Advocated FIRST to Kazakhstan School
- Advocated FIRST to Air Force School Bangalore
- Advocated FIRST to TISb
- Advocated FIRST to Spark A Change NGO
- Advocated FIRST to Several NGOs, including Gyanada, Grey SIM learning, Oscar foundation, TEACH, Universe Simplified, Masoom foundation, GSLF
- Advocated FIRST to Cathedral
- Advocated FIRST to several ATL Schools



STEM Workshop @Kalaghoda Arts Festival

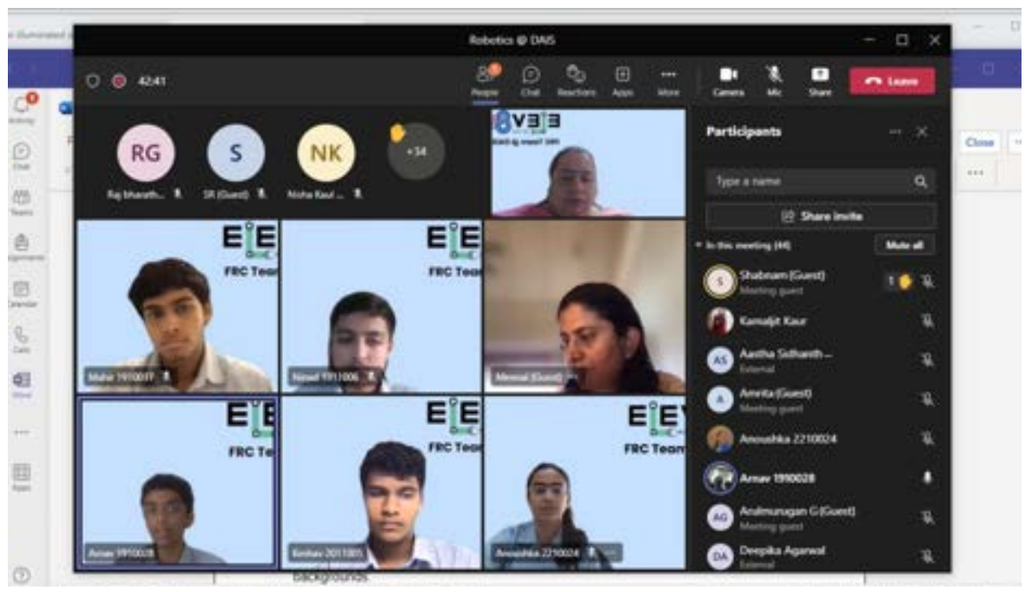
The Kala Ghoda Arts Festival is an annual event that celebrates the rich cultural heritage of Mumbai. This year, our robotics team was invited to conduct a workshop for children aged five and above. We were thrilled to have the opportunity to teach young minds about the world of robotics.

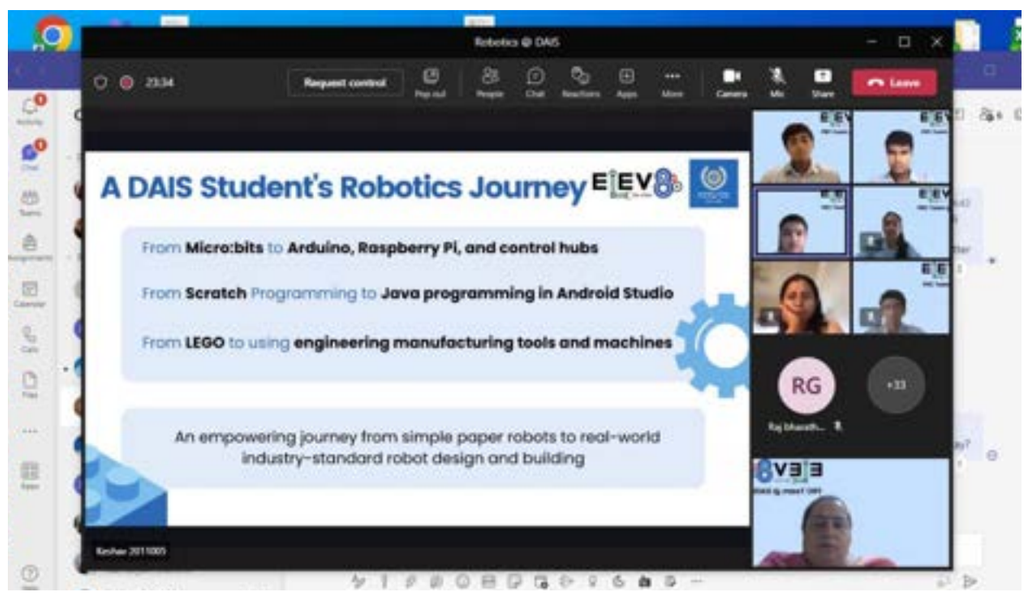
The workshop began with a brief introduction to microbits, which are pocket-sized computers that introduce you to how software and hardware work together. We explained how microbits work and demonstrated a few simple programs that could be used to control LEDs and other components. After the introduction, we divided the children into small groups and handed out microbits and laptops. Each child was given a step-by-step guide to programming their microbit using the 'makecode' platform. They were tasked with creating a simple program that would turn on LED's in the shape of a smiley face when the code was run. It was amazing to see the children's faces light up as they successfully programmed their microbits to perform the desired tasks.

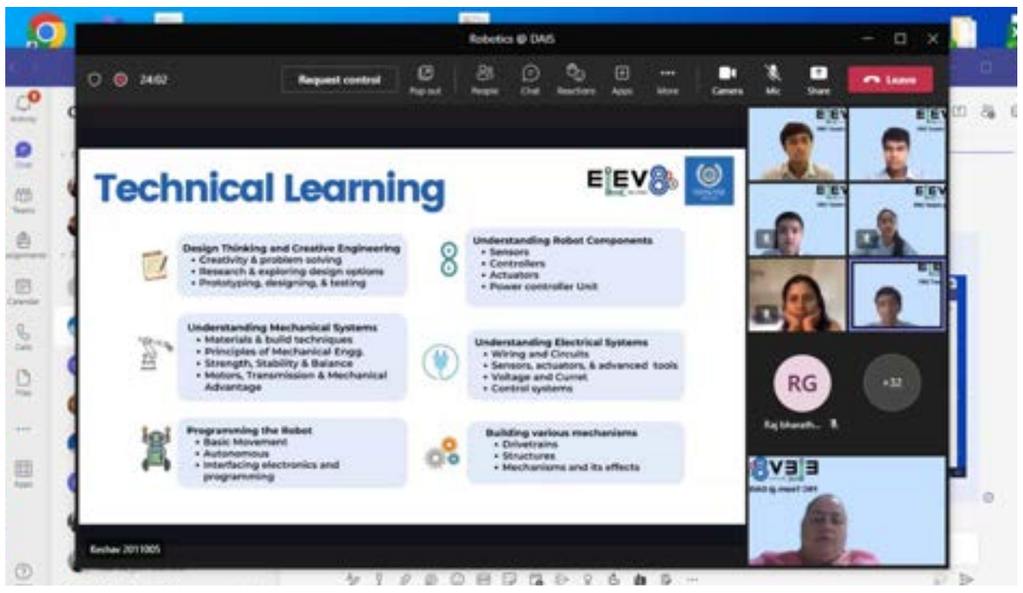


Presentation to Heads of 33 IB Schools

In December 2022, we got the chance to present the Robotics programme and the FIRST programme on behalf of our school to over 33 IB Schools present in India. This was a great opportunity for us to spread the message of FIRST and continue being in contact with numerous other schools. We hope to, in the future, start more FIRST teams with the schools that came to watch us in those presentations. We talked about the robotics programme at our school, and the ways that we are working with students from the primary level all the way to the secondary level, including FTC and FRC. We also discussed sustainability at our school, and how different STEM-related programmes are sustainable in the way that each student experiences the ideals of FIRST in different stages of their education.







DAIS CAS Fete

The CAS fete is an annual event held at Dhirubhai Ambani International School, where students from Grade 11 put up stalls, play games and sell merchandise in order to raise funds for NGOs. We have had a Team Elev8 stall in 2018, 2019 and also in 2023. We conducted games like Robo-Soccer, bowling pin shooter, and even had a VAR game designed by a team member. Our stall spread STEM awareness among 500+ attendees, and allowed people of all age-groups to engage with STEM in a exciting and unique manner.

AALTO Finnish AI Workshop

Team Elev8 was able to host a workshop on Ethics in Artificial Intilligence and Computer Studies, for students on the 14th and 15th of January. The event, workshop was an Indo-Finnish collaboration with Professor Nitin Sawhney and Uttishta Varanasi from AALTO, Finland; a pronounced research university. The event had a great turnout of numerous young students aspiring to learn about AI and CS!

Outreach with ASB's FTC Team Pangea

On 3rd February 2023, the American School of Bombay's robotics FTC team Pangaea held a design thinking workshop. At this workshop, members from team Elev8 helped team Pangea and assisted teams that were either participating in a variety of FIRST robotics competitions such as FTC, and FRC, as well as those aspiring to join FIRST. Members from team Elev8, helped students from a variety of schools create models on how to tackle prominent sustainable issues in India using robotics. One of the teams which team Elev8, was able to help won the award for 'Best Design.' We, along with FTC Teams Matrix and Eureka, supported them as they ran this event.

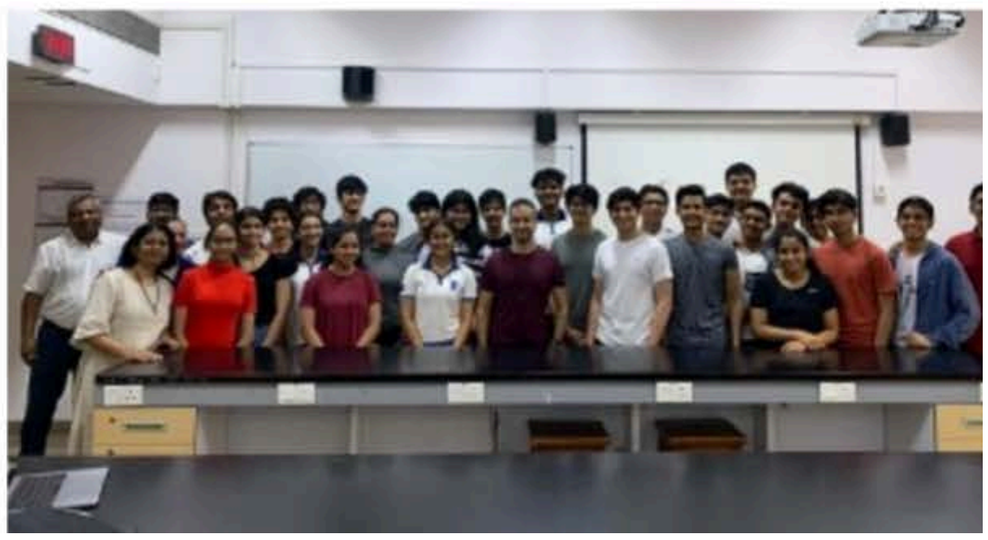
Meeting with Dean Kamen

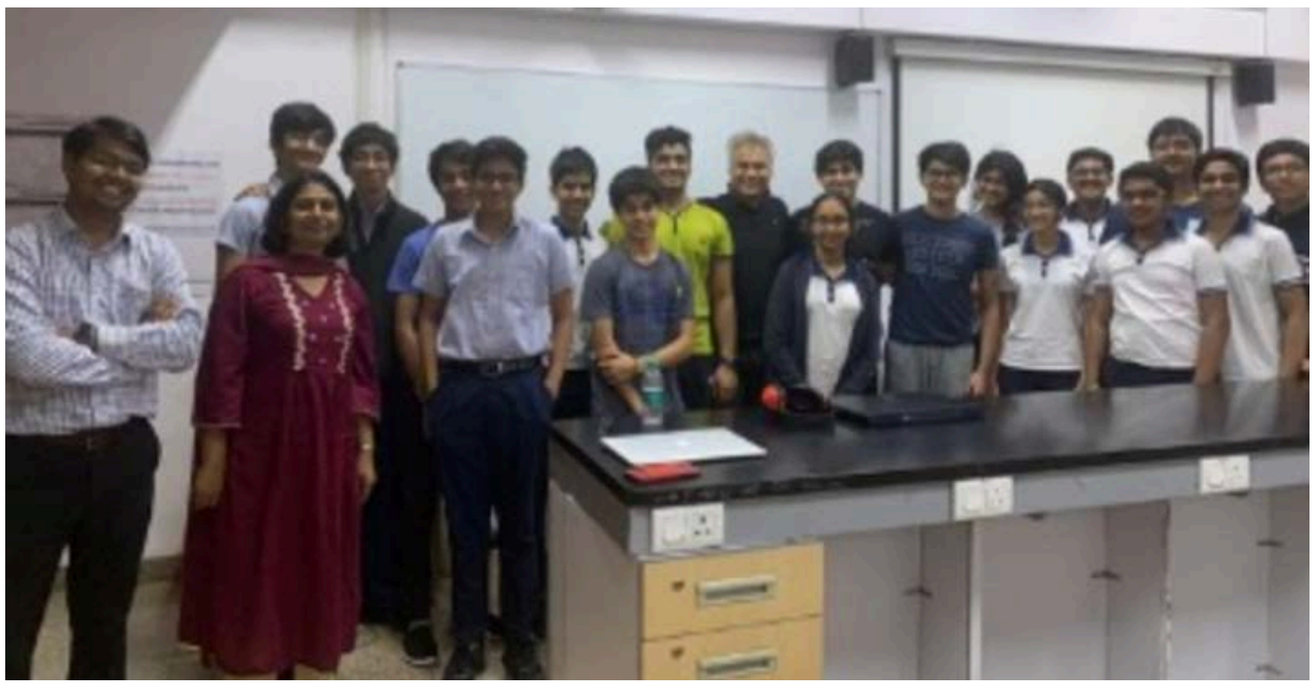
In 2021, we invited Dean for being a part of the FIRST India Kick-off. His words truly inspired us and all the participants. He helped us understand why we should encourage people into the fields of Science and Technology and to break the barriers which stop them from getting there. Learning from him on how to deal with failure was a key takeaway for all of us. It was a great experience interacting with him and hope we have an opportunity to meet in person soon!

We also thank our alliance teams - Beyond the Flames #8235 from NPS, Singapore, Wall-East #8540 from UWC Singapore, Binary Bolts #8570 from ABWA Mumbai, Brave Solders #8582 from The Sri Ram School, Delhi and Bangalore Bandits #8597 from Bangalore for their presentations and participation!

Infinite Inspiration Speaker Series

“Infinite Inspirations” is a series of outreaches started by Team Elev8. This weekly series allowed us to interact with influential change-makers and CEOs from companies like TV18, Antarang, Hungama. We have also had professors from respected schools like the Indian Institution of Technology. Through these 12 sessions, we were able to spread the message of FIRST and FIRST programs. Additionally, these sessions were highly beneficial as we received important feedback on our presentational skills that helped us improve our outreach and fundraising events. We also took back many life lessons and essential skills from these sessions.



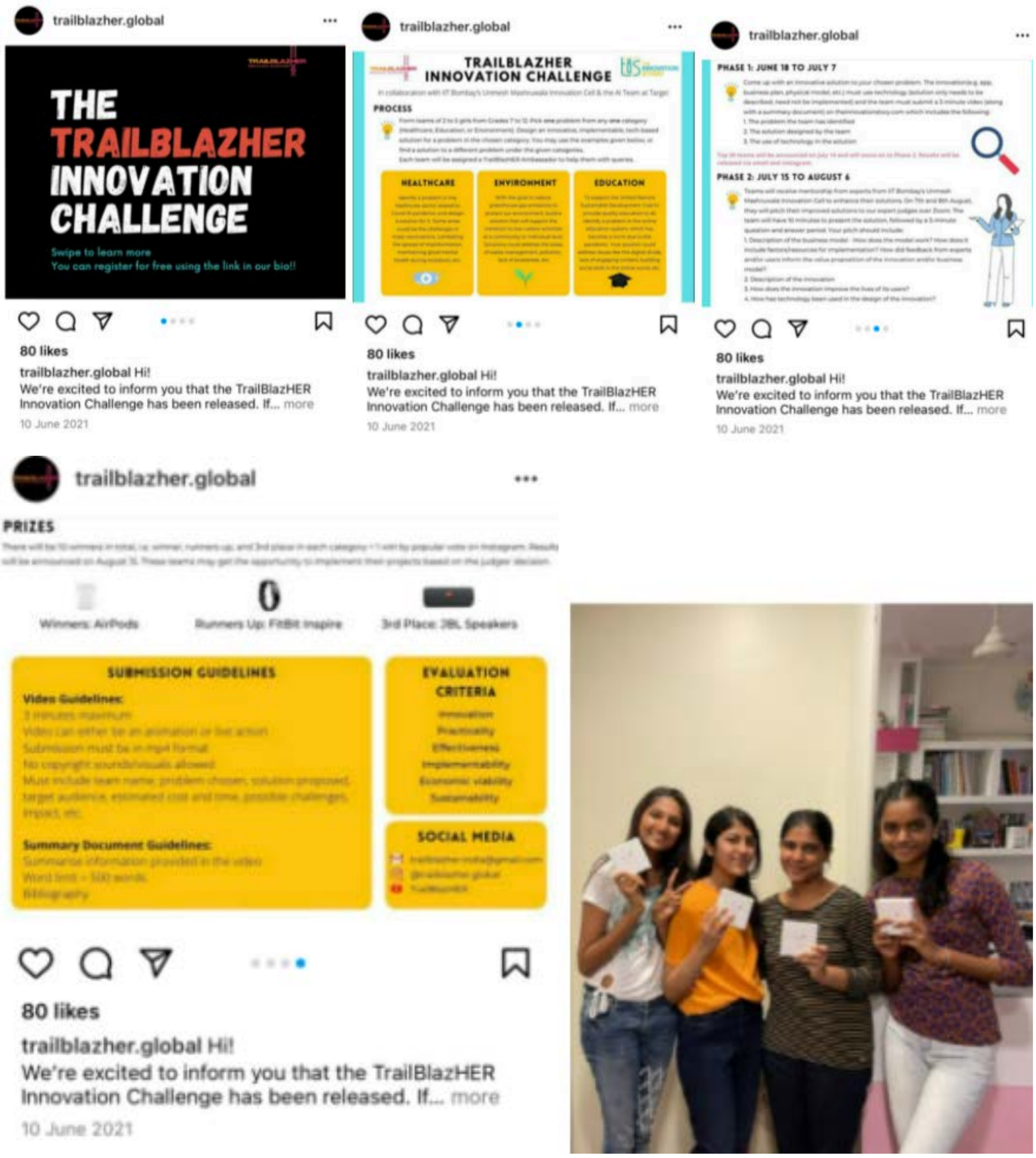


PROMOTING INCLUSION

GIRLS IN STEM OUTREACH

TrailblazHer Innovation Challenge

We designed, organized, and conducted an international innovation challenge with 400 girls. This allowed us to introduce girls to the field of STEM by encouraging them to work on a research project of their own. After the first qualification round, we collaborated with the Innovation Cell at IIT Bombay to mentor the teams that qualified. We had tech leaders judging their presentations and sponsors who funded exciting prizes for the winners.

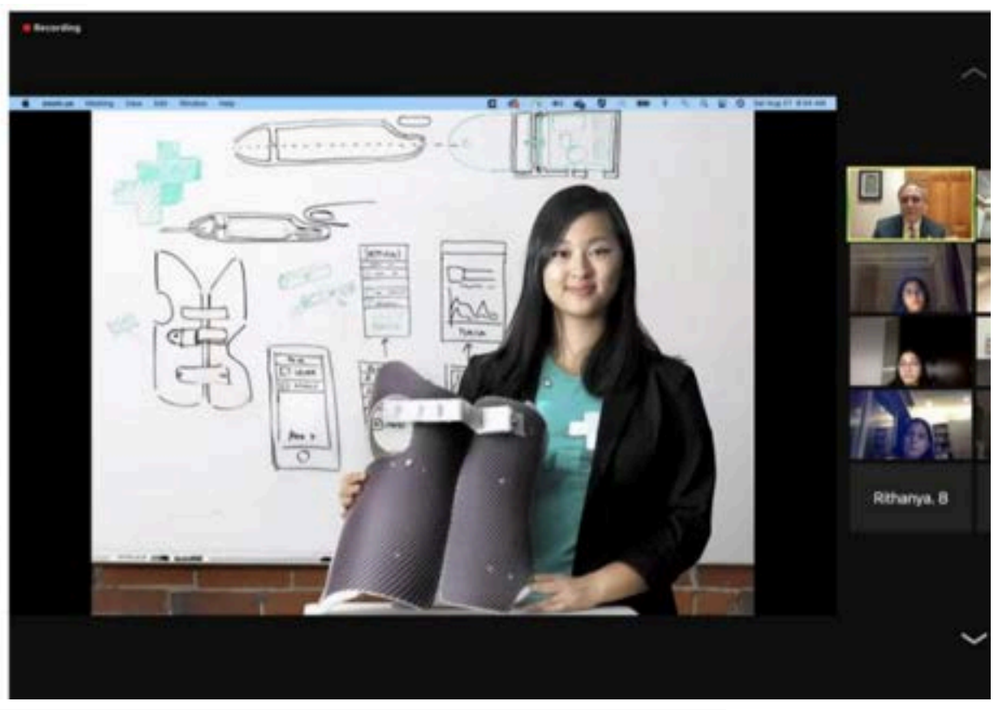


TrailBlazHer Innovation Challenge Kick-Off & Panel Discussion

Panel discussion with experts (Mr. Adheet Gogate, Mr. Nicholas Achin, Ms. Anjali Karpe, Ms. Monisha Narke, Ms. Anuja Byotra) in Healthcare, Environment and Education to help students generate project ideas. There were over a 100 participants.

TrailBlazHer Award Ceremony

Awards ceremony with guest speaker Vincent Wilczynski (Deputy Dean, Yale School of Engineering and Applied Science). There were 150+ participants.



TrailblazHer Instagram Live Series

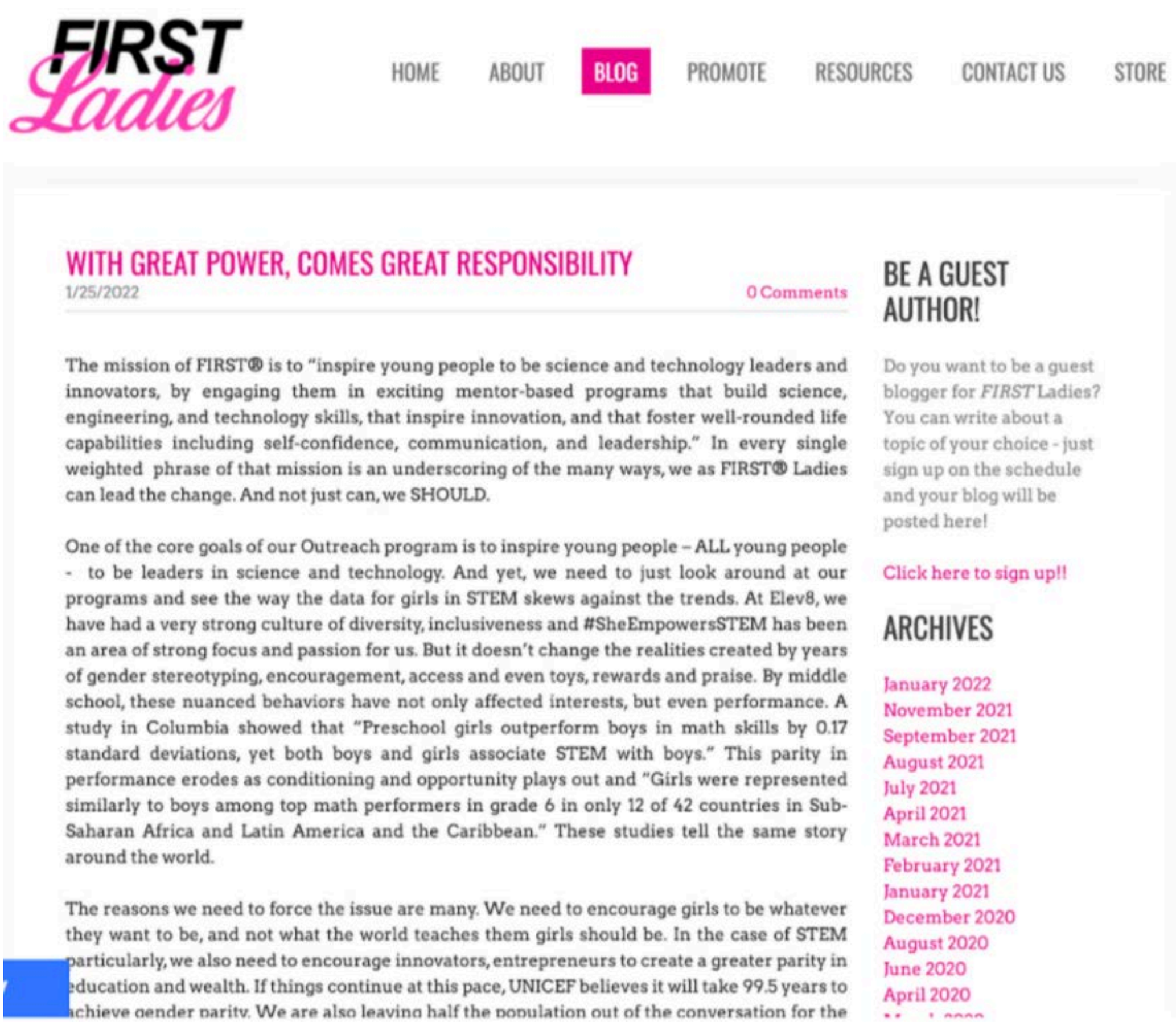
Inspirational Instagram live interviews with Vaidehi Patil, Deepali Nair about being a woman in STEM.

Personal Narrative Workshop - Your Life Your Story

Writing workshop by Rashmi Bansal with 40 all-girl participants

Regional Partners with FIRST Ladies

We are officially the regional partners of FIRST Ladies. FIRST Ladies is a massive community of students, mentors and anyone else involved in FIRST programs who support and want to be a part of the women in STEM movement. This group was created to promote inclusion and provide a place for girls on teams around the world to make connections - ask questions, make friends, find support, and discover new opportunities. We write blog posts that go up on their website. We have hosted events like the FTC Girls in FIRST Hackathon and Design Challenge.



All-Girls FIRST Teams

We started and mentored 4 All-Girls teams.

Two of Team Elev8's members represented India as a part of an all-girls team at the FIRST Global Competition. We also started and mentored FTC Team #19009 Codesign, in the 2020-21 season, an all-girls FTC team from our school. And this year, we have started and mentored two more FTC all-girls teams from the NGOs, Abhyudaya and Avsara.

STEM Workshop on International Women's Day

We conducted an outreach amongst girls from grades 1-4, to work towards our goal of making the field of STEM, a girl-friendly environment, at our school. This outreach meant a lot to us as we were finally showing the fruit of our hard work to none other than the juniors of our own school. We introduced them to our robot, and explained the basic concepts to them, such as the wiring and working of motors. The children had a lot of questions that varied from what code is used for the robot to whether it has a name, and it was a very interactive session. We explained our deep space challenge, and their jaws dropped when they saw our robot in action, shooting cargo and securing it with the hatch panels. Several of them were already interested in pursuing FIRST events like FLL and FTC.

Weekly STEM Workshops for Girls

We conducted a 4-week Robotics workshop for girls from grades 5-9 at Dhirubhai Ambani International School. We successfully achieved the purpose of the workshops by spreading awareness of STEM and FIRST programs. We guided the students through the construction of lego robots and EV3 bricks. We also addressed the various aspects of FIRST programs like outreach, construction and programming.

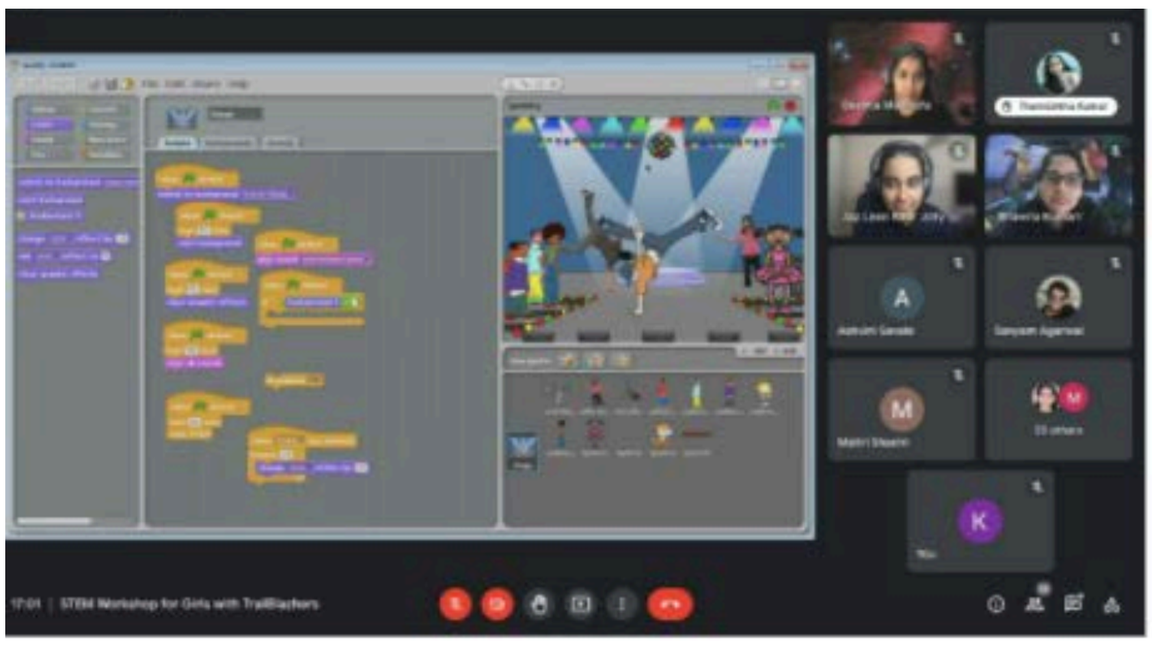
National Girl Child Day

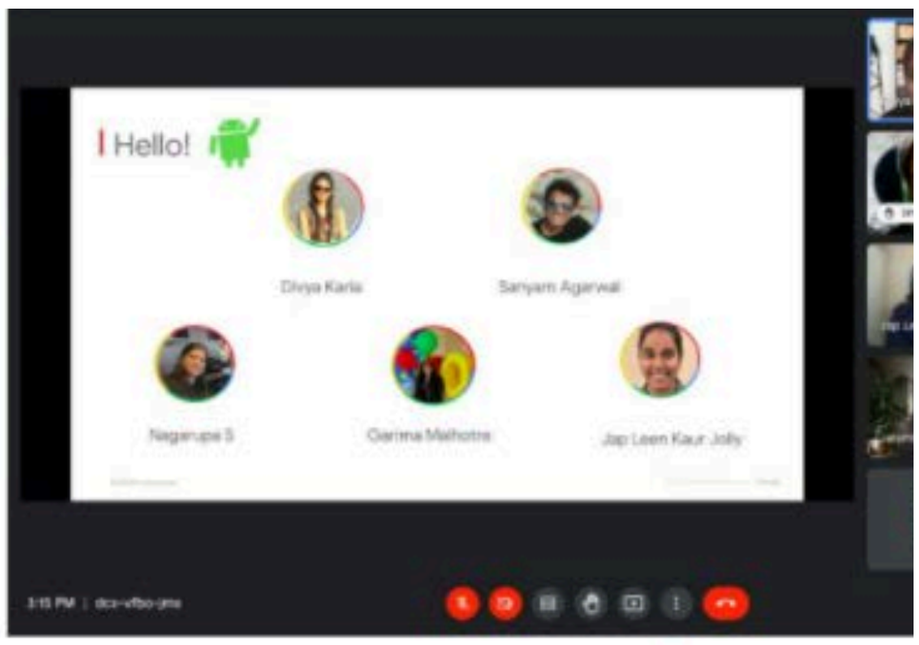
On 24th January India celebrates National Girl Child Day. Team Elev8 held a girl's centric outreach to celebrate this day. The purpose of the outreach was to educate girls about different STEM and FIRST fields as well as peak their interest in robotics.

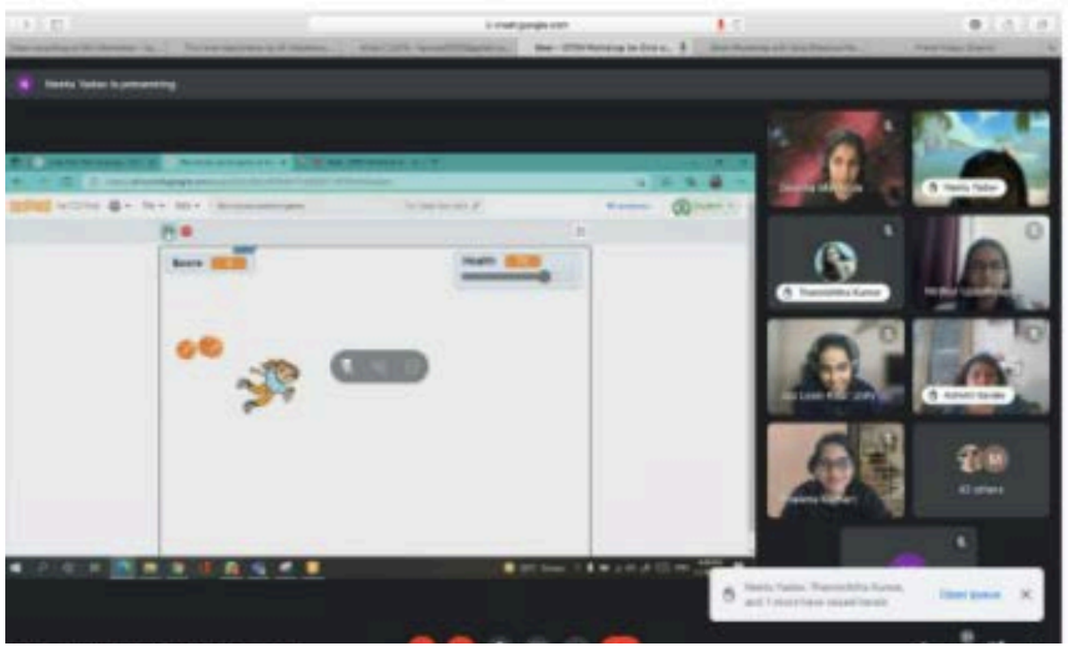
The outreach was held in Dhirubhai Ambani International School with girls of grades 6. The event allowed girls to push the limits and explore robotics as they built Lego robots and solved numerous challenges.

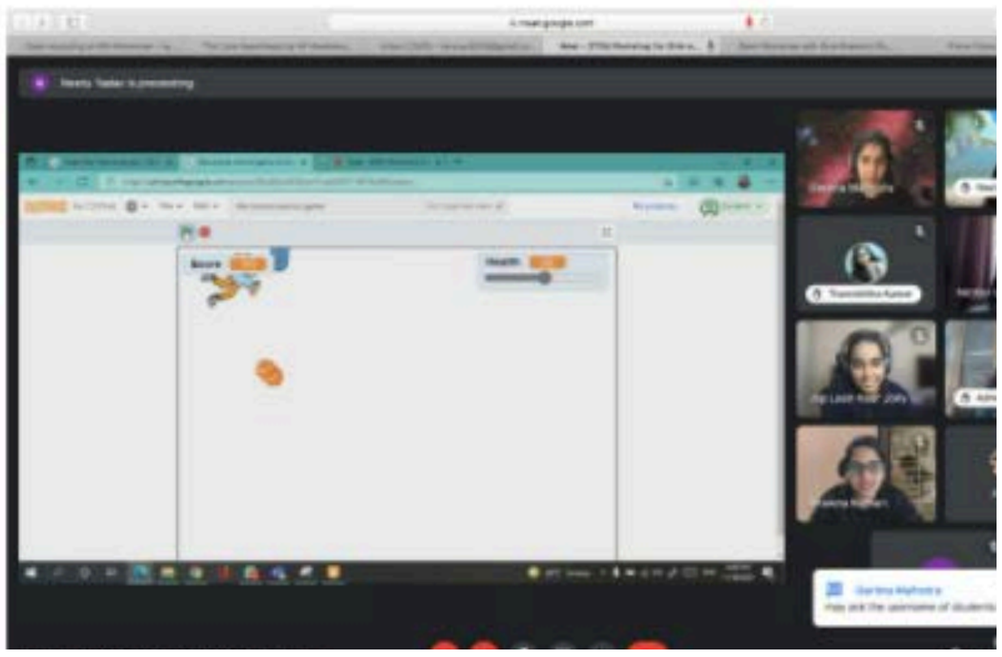
Coding Workshop for girls in collaboration with Women@Google

We reached out to Women@Google to help conduct a coding workshop for girls. It was a great success as young girls took their first steps into the world of coding with Scratch. They were able to make some fantastic projects.









Minecraft: Hour of code

We organized a session with girls to teach them the basics of giving computers instructions and coding, using the popular game, Minecraft. This one-hour session left these young girls with smiles and a sense of accomplishment.

PROMOTING INCLUSION

UNDERSERVED COMMUNITIES

FTC Teams with Underserved Communities

We have mentored students from 12 NGOs for FTC. This year alone, we have started, mentored and funded 3 teams comprising of students entirely from NGOs:

1. FTC CuriousC!ty #20872- Salaam Bombay
2. FTC Ascendant #20873- Abhyudaya
3. FTC Avsara #21045 - Avsara

In 2022-2023, we mentored a total of 9 NGO FRC teams, of which 3 of the above continued in the season. Two of them are specially abled: Team Robo and Team Spark.

Sankalp Shiksha Sanstha - Mentoring hearing-impaired students

The Sankalp Shikshan Sanstha works with students who have hearing disabilities. Our team visits the institution on a weekly basis where we have introduced them to Robotics and FLL. The team has mentored two Sankalp teams that have participated in the FLL regionals. Our aim here was to expose the students to robotics and break the communication barriers to provide the students with an enriching and extremely beneficial opportunity. The students have come a long way as they have learnt essential values like cooperation and teamwork. Our interaction with them has given them exposure to the various fields in STEM which has helped them explore various paths they can follow in the future. They have continued with their interest in STEM by pursuing FTC in this year in 2023. They have formed 2 teams: Spark and Robo. Team Spark also won the Rising Star Award at the Regional this year.

FTC #22751: Sankalp 2

FTC #22989: Sankalp 1

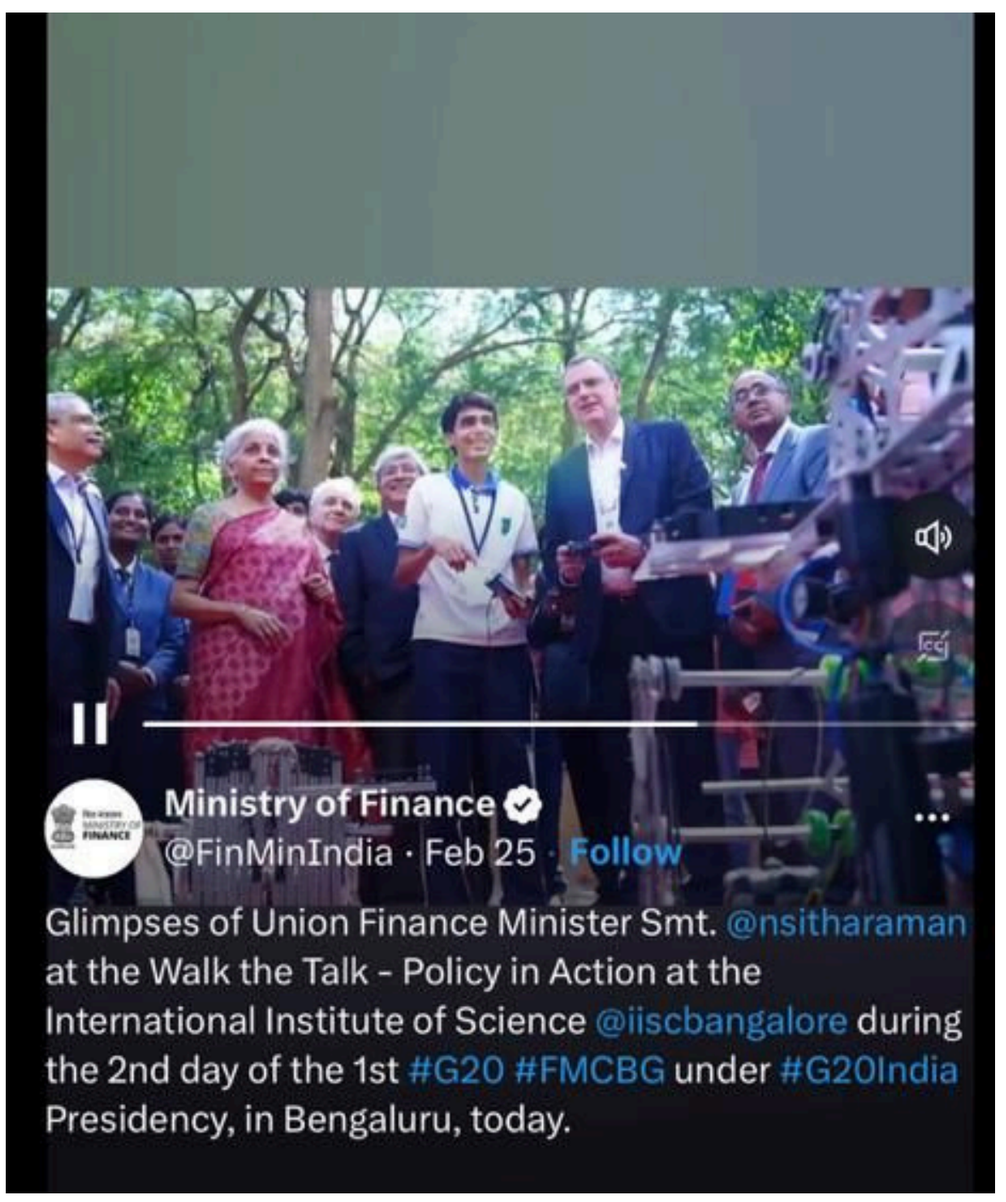
ALaptopStory
Donating Laptops to Underprivileged Students

During the pandemic, the lack of access to resources caused learning to almost come to a standstill, especially in underserved communities. To combat this, we started ALaptopStory, an initiative wherein we raised funds from individual and corporate sponsors to provide 185+ laptops to students across India.

GOVERNMENT OUTREACH

Presented our Robot to National & International Ministers at the G20 Deep Tech Summit, Bangalore

We had the opportunity to showcase our robot to national and international government officials at the G20 Deep Tech Summit held in Bangalore. We presented these robots to the finance minister of India, Nirmala Sitharaman, the governor of the Reserve Bank of India, Shaktikanta Das, and Finance ministers from all over the world. The event was broadcasted live and received extensive media coverage, proving to be a incredible opportunity for us to promote STEM awareness and the FIRST Program.



Meetings with NITI Aayog, The Government of India's Think Tank

We have had 4 meetings with the Indian government and its think tank, NITI Aayog. We met with Mr Amitabh Kant (CEO, NITI Aayog) and Mr Rajiv Kumar (Vice Chairman, NITI Aayog) in Delhi and had a fruitful conversation about how we can improve awareness of robotics and STEM. We took this further by meeting with Mr Ramanan who is the Mission Director of Atal Tinkering Labs. We discussed proposals about how Team Elev8 could work with the ATL schools, present across the country. Along with this, we also met with Mr Sandeep Khuperkar who is the Regional Mentor of Change for NITI Aayog, and worked towards spreading awareness about FIRST and FIRST programmes.

Meeting with the Governor of the Reserve Bank of India

We also met with Mr Shaktikanta Das, who was the Governor of the Central Bank (Reserve Bank of India), and pitched our vision and mission to him.

SKILL-BUILDING INITIATIVES

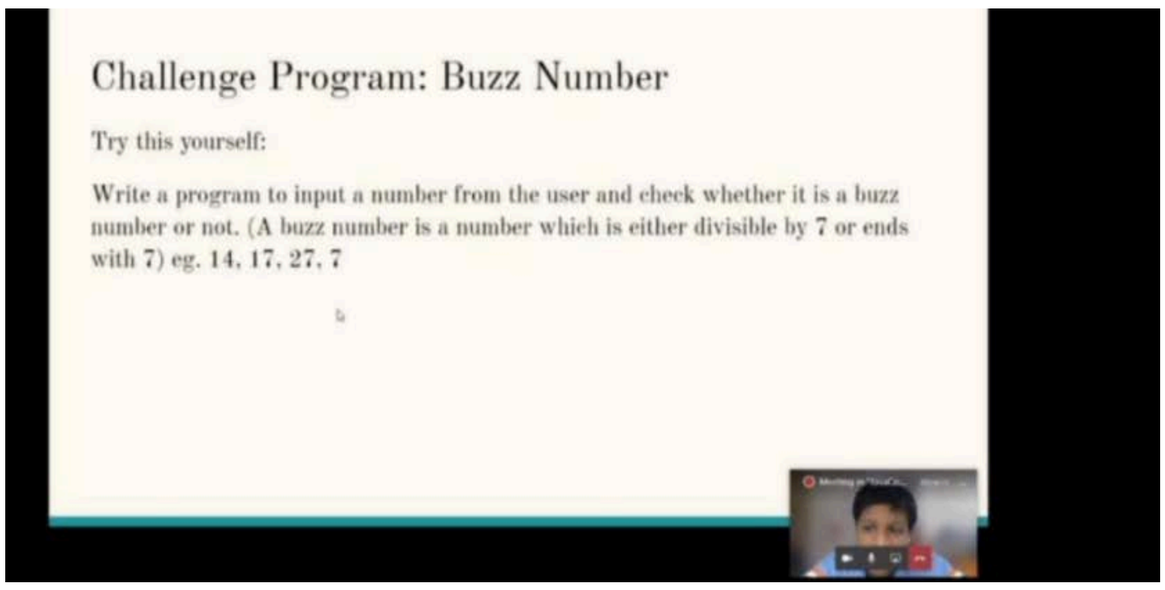
Robotics Deconstructed - Our Flagship Skill-building Initiative

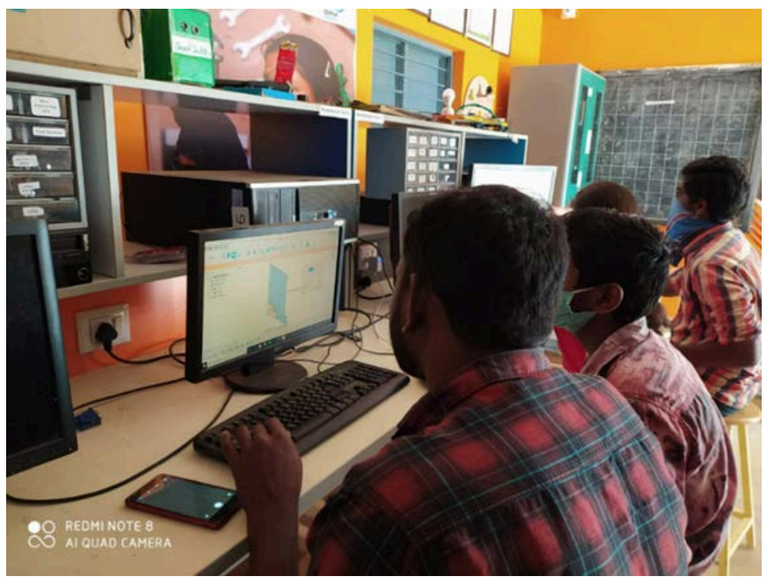
Robotics Deconstructed was a student-driven programme, with a 30-hour courses designed by students for students. We started off with a pilot run within our school, with 140 enthusiastic participants. Seeing the success, we scaled up the programme, reaching out to students all across the country.

We had 15 student mentors and teaching assistants from Team Elev8 teaching the WPI Programming Course, the Java Fundamentals course and the Computer-Aided Design (CAD) course. We were pleased to see the enthusiasm of the students and were motivated further by a large number of participants. Through this program, we have been able to start 17 new FTC teams and 6 FRC teams as participants went on to join FIRST teams, using the skills they had acquired here.

The course structure of this programme involved:

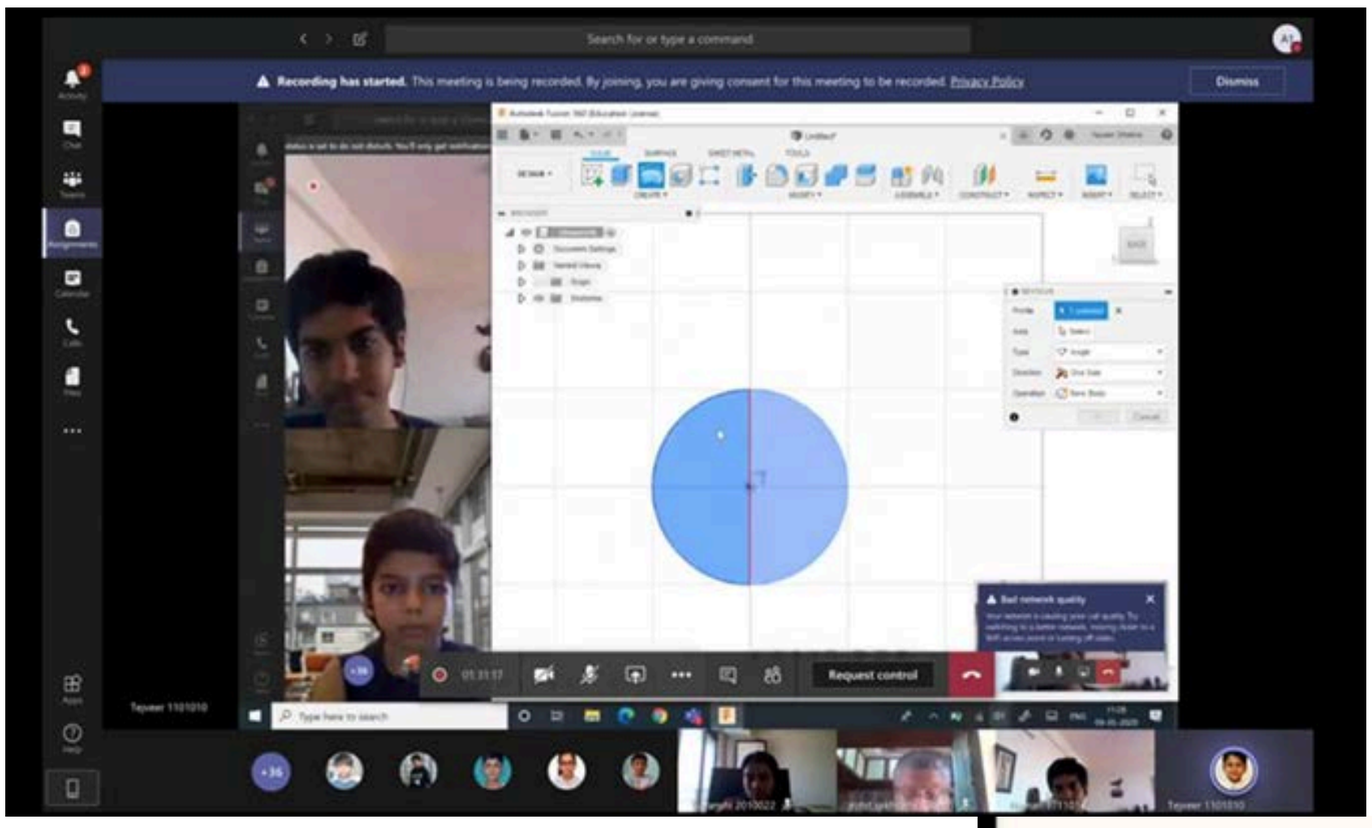
1. **WPI Deconstructed:** Students learned how to create advanced robot control functions using the WPI Software Library.
2. **Java Fundamentals:** We taught students Object-Oriented programming in Java, and how to use their skills to make programs with real-world applications.
3. **CAD Deconstructed:** We taught the students how to go about using CAD software Fusion 360 enabling them to convert 2D sketches to 3D objects, create joints, apply appearances to models and change their materials, and use simulations to test out designs.





With over 450 students enrolled in the programme, we had a total of approximately 900 hours of mentoring. Here is a quick list of the locations with conducted Robotics Deconstructed at:

- Robotics Deconstructed @ DAIS
- Robotics Deconstructed @ ABWA
- Robotics Deconstructed @ TISB
- Robotics Deconstructed @ UWC Singapore
- Robotics Deconstructed @ NPS Singapore
- Robotics Deconstructed @ The Sri Ram School
- Robotics Deconstructed @ Air Force School Bangalore
- Robotics Deconstructed @ BIS
- Robotics Deconstructed @ Hill Spring International
- Robotics Deconstructed @ several Delhi Schools, including Mother's international, Mayoor schools, Prakriti School, Vasant Valley School
- Robotics Deconstructed @ Turkey School
- Robotics Deconstructed @ Kazakhstan School (Caravan of Knowledge)
- Robotics Deconstructed @ Spark A Change (NGO)
- Robotics Deconstructed @ Several NGOs, including Gyanada, Grey SIM learning, Oscar Foundation, TEACH, Universe Simplified, Masoom Foundation, GSLF
- Robotics Deconstructed @ WIIM (Women at Indian Institute of Management)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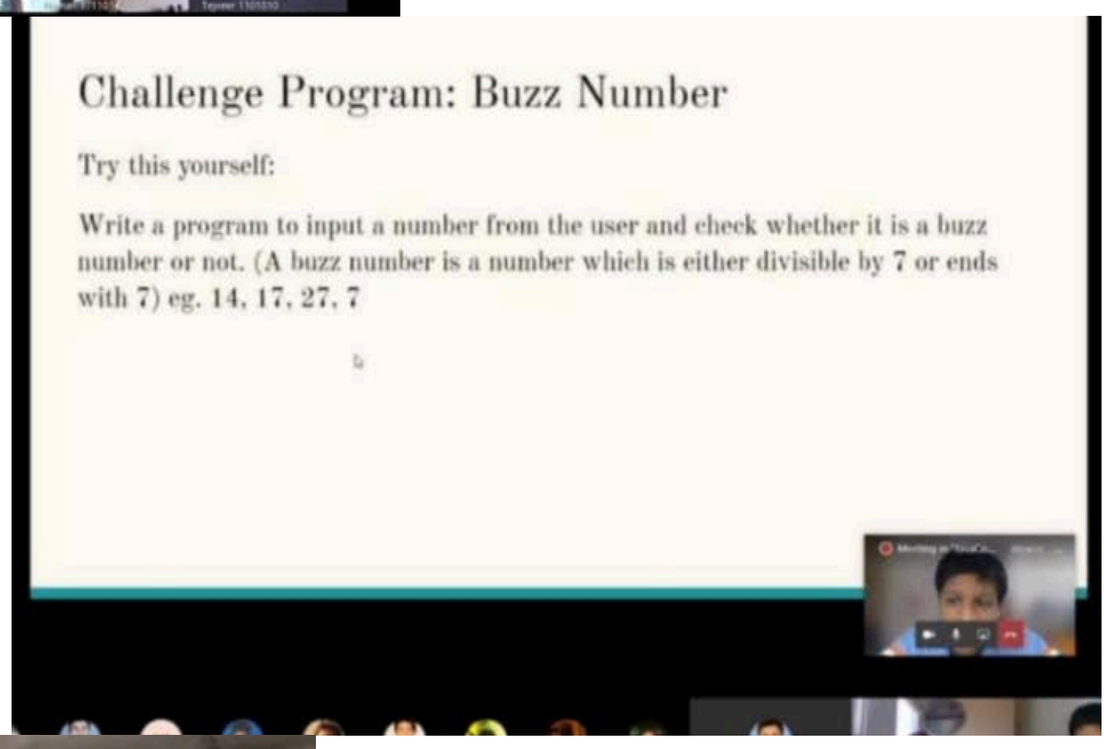
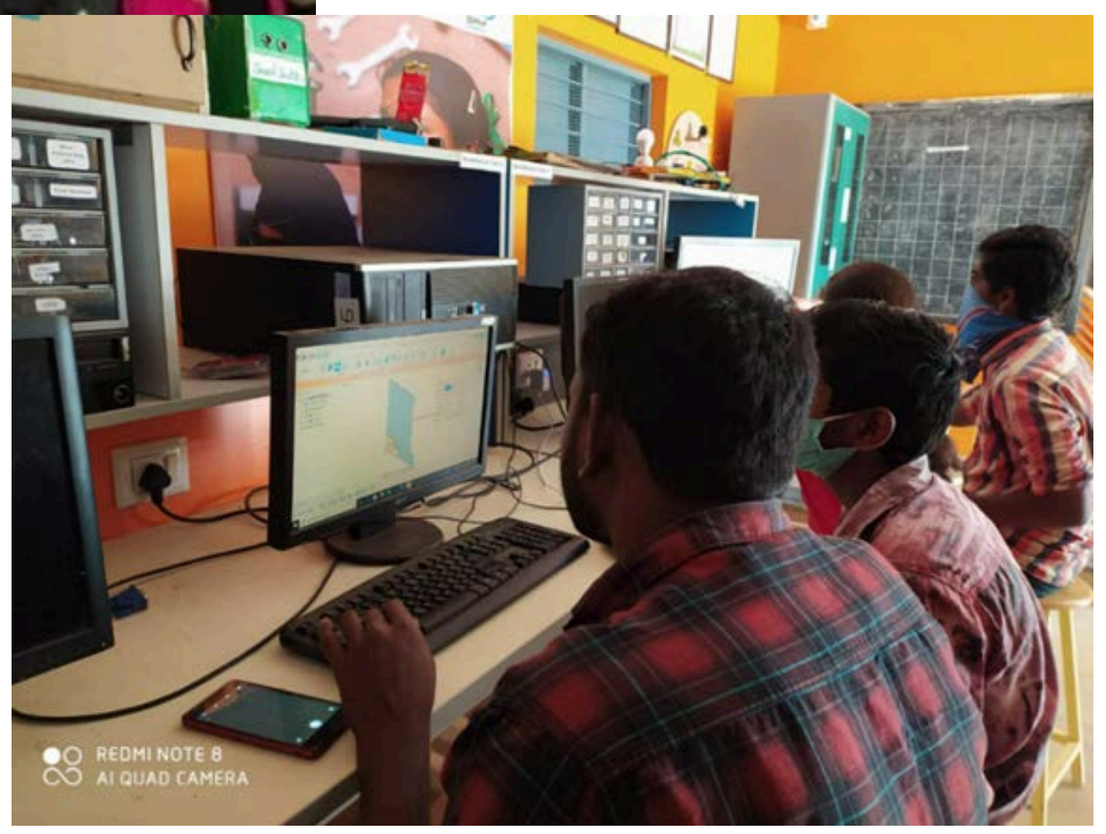

Challenge Program: Buzz Number
Try this yourself:
Write a program to input a number from the user and check whether it is a buzz number or not. (A buzz number is a number which is either divisible by 7 or ends with 7) eg. 14, 17, 27, 7


REDMI NOTE 8
AI QUAD CAMERA

Rookie Team Saturdays - Assistance for Rookie FTC and FRC Teams

Rookie Team Saturdays was an initiative we started to provide rookie FIRST teams with assistance on key aspects of the competitions, both technical and non-technical. We held a series of weekly sessions for rookie teams in the FIRST ecosystem. With hundreds of attendees learning a wide variety of skills, from industry experts, we were able to conduct mass mentoring sessions and impart the knowledge we had gained in our years of doing FRC. In this way, students would be able to face some of the challenges that are normally faced by rookie teams.

COVID RELIEF

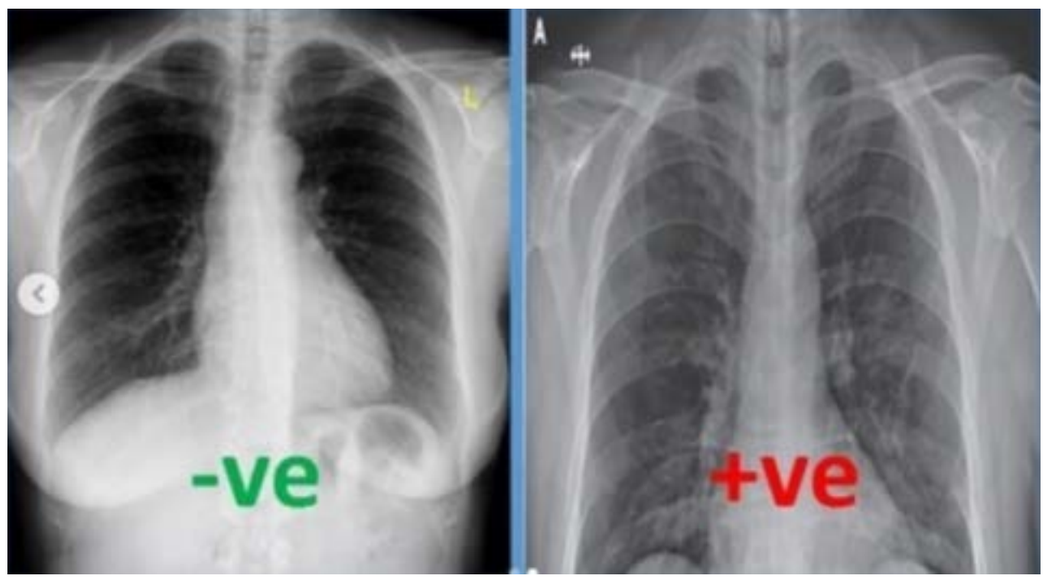
We provided help to the covid frontline workers and the underserved by providing them with PPE kits

June 2020

Dharavi

We raised funds for covid relief and distributed over 1000 masks in Dharavi, a slum area in Mumbai

Two members of our team developed an AI Model detecting COVID-19 from X-ray



Class XI students work on model to spot X-rays of Covid-19 patients

Vinamrata Borwankar & Yogita Rao | TNN

Mumbai: Two city teens have joined several others across the world in the fight against the Covid-19 pandemic. Class XI students of Dhirubhai Ambani International School, Sumeet Morvani and Siddharth Parekh, have used artificial intelligence to build a model they claim can differentiate between X-rays of Covid-19 patients and those of others in less than a second.

Over the past three weeks, the two have scoured the Internet for open source information to help them build their project. "We used over 150 X-rays available on Github and Google, websites hosting Co-

Siddharth & Sumeet

how different the X-ray of a Covid-19 patient is from a normal one. Based on this and our knowledge with machine learning, we began work," said Parekh.

Through the model, the two have till now tested 50 X-rays, thrice, and claim an accuracy of 81%.

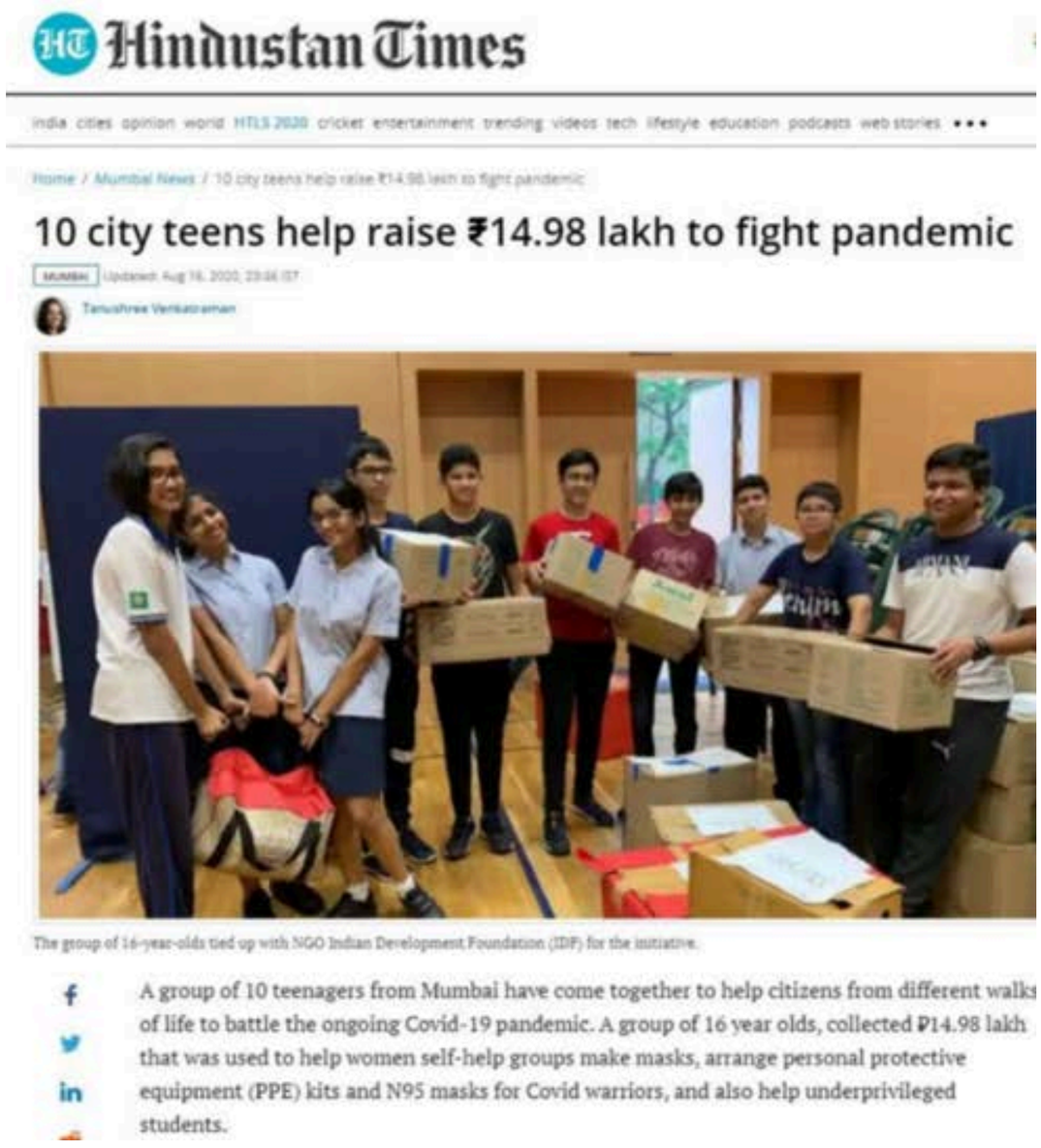
"Among the Covid-19 positive patients, the accuracy was 100%, but there were a few false negatives in the other set. We are trying to further build and update our model by gathering as much data as possible," said Morvani. While not peer reviewed or validated yet, the two are contacting the BMC to present their work in the coming week.

sed using a chest X-ray and blood test, said Dr VA Sajit Babu, consulting chest physician. "In the UK, doctors working in a heavy-load Covid-19 ICU use X-ray along with clinical signs and symptoms to diagnose the infection. They do not wait for the Covid-19 test to label a case. That scenario is yet to happen here. X-rays are compulsory here for people showing respiratory symptoms. But the nasopharyngeal swab test is a must to confirm all Covid-19 suspect cases," said the doctor.

Amit Sethi, an expert in medical image analysis from IIT-Bombay, said, "Many people are working on machine learning models for Covid-19 diagnosis, but a lot more needs to be done before the model is deployable." He, however, said the

We conducted an online campaign 'Stay Home, Stay Safe' to promote COVID saety

We participated in the Project Humsahayak and the Project Samvedna and raised 1.3 million rupees and 1.5 million rupees, respectively



TEAM MEMBER INNOVATIONS

Lavanya Iyer innovated ‘Kynaid’, a Robotic tool helping in the speedy recovery of patients and effective physiotherapy management

Kynaid

Shiv Kampani innovated SENSAFE, a Smart Gas Leak Detector

Shiv also created a robot to replace manual scavenging

Naman Pushp worked on an uninterrupted power supply for Raspberry Pi

He also made a CAD of a full-face covering face mask, ready to be 3D Printed

Full-face covering mask

Aryaa Rojekar created a tool that cleans and improves the efficiency of solar panels through Robotics

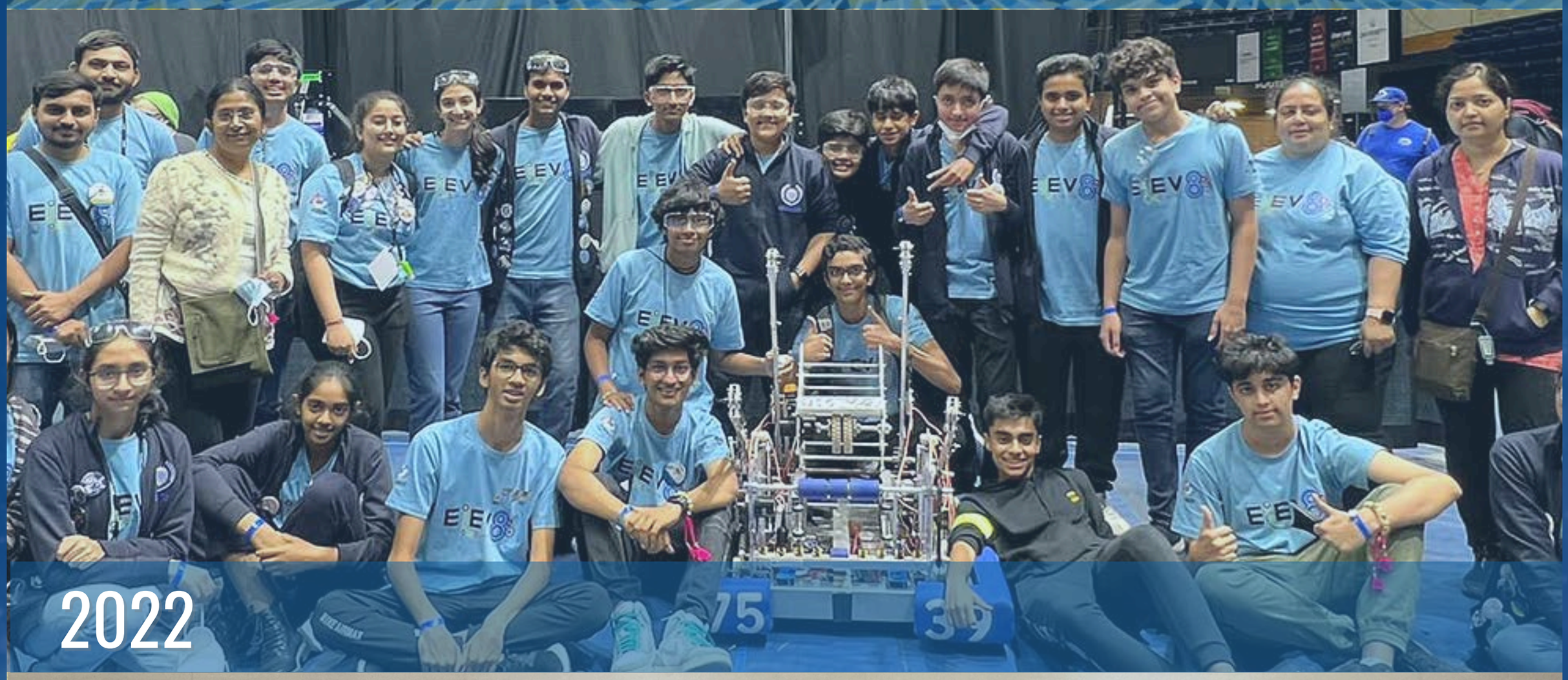
C-AiR

Arnav created a mechanism called C-AiR to filter vehicle exhaust

He also programmed an app called ‘Re-apply’ to upcycle daily use items

Aryan Gupta developed an AI model detecting driver vision distraction

2019



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