Sarvajanik Education Society

Sarvajanik College of Engineering & Technology

Towards progressive civilization...

A Report on

Data Science Challenge - 1.0 (DSC - 1.0)

Event Date: 28th & 29th January, 2022

Organized by:

Sarvajanik College of Engineering and Technology

In association with

IEEE SPS SCET SBC, IEEE SCET Student Branch & IEEE SPS GS

IEEE SCET, SB

IEEE Signal Processing Society GUJARAT CHAPTER

IEEE Signal Processing Society SCET STUDENT BRANCH CHAPTER

Team behind the Event:

Patron: Prof. Hiren Patel

General Chair: Prof. Chirag Paunwala

Organizing Chair: Prof. Ketki Pathak and Prof. Sarosh Dastoor

Treasurer: Prof. Neeta Chapatwala

Student coordinators:

1. Abanob Bhanu, chair, IEEE SCET SB
2. Darshan Mevawala, ex-treasurer, IEEE SCET SB

Student Volunteers:

1. Takshil Kunadiam, Vice-chair, IEEE SCET SB
2. Muskan Jhawar, Secretary, IEEE SCET SB
3. Poojan Dalal, Student Advisor, IEEE SCET SB
4. Vrushika Ijardar, Chair, IEEE WIE AG SCET SB
5. Parth Gajjar, Design Lead, IEEE SCET SB

Event Details:

Event Type: Project Competition

Event Mode: Online

Event Platform: Google Meet (https://meet.google.com/mjg-pnga-awi)

Event Category: Technical Event

Event Date and Time: 28th January 2022 - 11:00 to 17:00 IST
29th January 2022 - 11:00 to 15:00 IST

Event Accessibility: For registered participants

Event Related Links:

Website: http://ieeespsgs.org/data-science-challenge/

Help Video: https://youtu.be/bp8MP90f6N8

Event Insight:

About the event:

The goal of this event was to turn data into information and information into insight. With a maximum of 3 members and 1 mentor, the participating team was given 4 contemporary problems to choose from. In the first round, teams were required to submit a 3-minute video clip, summarizing their work. Following a comprehensive review by jury members, select teams were given a problem statement in their domain of interest in addition to the required data set. In the final round, participants showcased their respective presentations alongside a working prototype in front of the jury members.

1) Problem Statements for the Qualifying Round:

For the First Round, We had provided 4 contemporary problem statement based on Signal Processing and Image processing theme. Participating teams were required to make a 3 min video submission summarizing their work on chosen problem statement.

1. Forecasting Problem

Time series forecasting can be framed as a supervised learning problem. Similarly, there are many areas like public health systems or crop diseases timely prediction will save the damage or loss in future span. For eg. if we want to predict the probability that some event will happen in the future or forecast how many units of a product would be sold over the next six months. Once the model is built and trained using the training data, participants can use it to generate their own probability estimates based on the test data. The test dataset provides the similar information in each feature column as that of the training data.

Various problems related to forecasting could be:

- Forecasting of financial market/stock exchange
- Weather forecasting
- Covid-19/disease forecasting for public health system
- Earthquake forecasting
- Forecasting of Agricultural Crop Disease Risk

2. Biomedical Signal Classification

Biomedical signals are signals primarily used to diagnose or detect specific pathological or physiological conditions. There are different biomedical signals including the electroencephalogram (EEG), the electrocardiogram (ECG), the electromyogram (EMG), the electroneurogram, the electroretinogram and so on. The proposed problem and hence, the solution must focus on the classification problem with respect to biomedical signals. An example therein is to predict neurological

disorders like epilepsy from EEG signal analysis with competitive accuracy. Classification can be binary like normal or abnormal signal or it can be multiclass classification for abnormal signals like for epilepsyictal-interictal-preictal.

3. Optical Character Recognition

Recognizing characters of any language has been a challenging task in the field of Machine Learning. Optical character recognition using Machine Learning algorithms should solve the problem of recognizing the characters related to Gujarati, Hindi or English language.

The proposed problem must concentrate on the following features:

Use of language data set from the Language Technology Proliferation and Deployment Center or any other authenticated source.

Vowels, part vowels of languages (in case of Guajarati and Hindi Languages) could be considered for recognition in words. Handwritten characters could also be used for identification. Characters combine to form a word and in turn, a sentence could be identified. Comparison of results in terms of performance parameters.

4. Digital Image Security

In today's era of the Internet, Images are a widely accepted form in information communication. However, floating images in its original form across the Internet can lead to potential information breach. So security of images containing critical personal information is utmost important. Typically, an image can be secured with any of the mechanisms viz. cryptography, steganography, watermarking, reversible watermarking.

The proposed problem and hence, the solution must focus on the security of images while transmitting across the internet. The input for the proposed solution can be any image file containing critical information and the output is the secured version of the source file which doesn't reveal that information. Such a secured file can be in terms of other image file or text file.

For example, a mammography report of a breast cancer patient should be secured before sending it from the laboratory to a doctor.

Evaluation of 3 minutes video clip was done by Mr Manan Shukla and Mr. Bhaumik Vaidya. Total 27 teams (108 participants) registered from all over the country for the event. 18 teams were selected for the Semi-final round on 28th Jan, 2022.

2) Problem Statements for Semi-final Round

Definite detailed problem statements were provided Prof Samaya Muhuri and Mr. Bhaumik Vaidya in this round. Qualified teams were required to code it in the stipulated time period of 6 hours. In the given time frame, 12 teams were able to code as per the given definite problem statements and made their way in the final round of the competition.

3) Final Round Presentation

Twelve finalist teams were asked to present their work (Code) before the panel of eminent jury members within 5 minutes. Many innovative solutions were provided by different teams related to the given problem statements. Throughout the presentation session, there was strong and lively communication between the teams and the jury members. Jury members provided excellent constructive criticism alongside their valuable suggestions to the participating teams. Four prizes were awarded by the jury members to the final round teams based on optimized results, generalization of code and accuracy. All the attendees, students and delegates demonstrated great satisfaction towards the event as well as participating teams expressed their gratitude with a positive feedback.

Registration and Event Management:

Registration of the event started on 18h November 2021 and a total of 27 teams registered for the event, from all over the country. Registration was well managed by student's office bearers of IEEE SPS SCET SBC and IEEE SCET SB, including

Abanob Bhanu, Darshan Mevawala, Muskan Jhawar and Poojan Dalal.The event was anchored by Mr. Hetav Raval and Ms. Shivangi Vyas, a III Year and I-year Electronics and Communication Engineering Student of SCET, Surat.

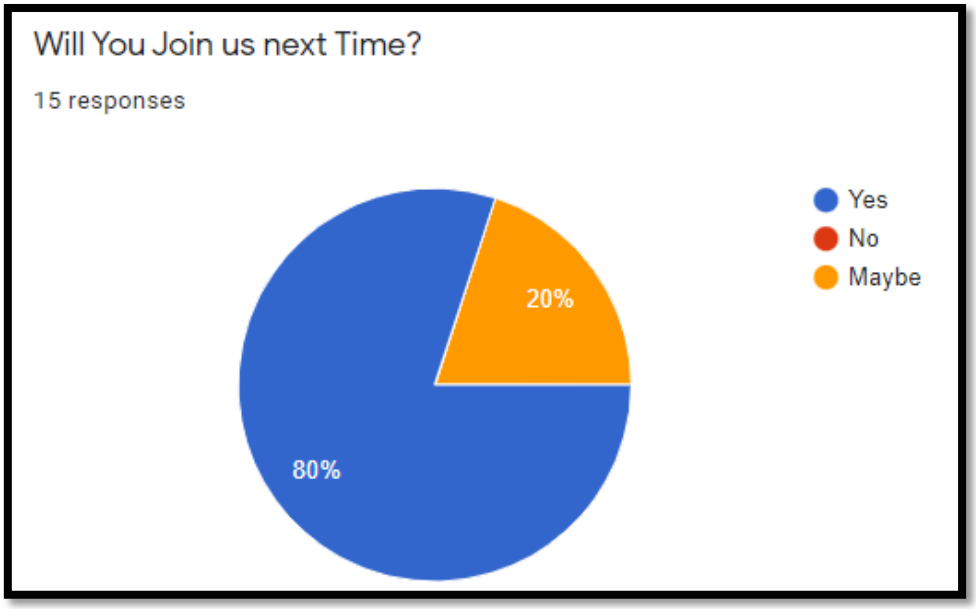
The event was very well-managed by Prof. Sarosh Dastoor, Advisor, IEEE SPS SCET SBC, Prof. Ketki Pathak, Branch Counsellor, IEEE SCET SB and Prof. Chirag Paunwala, Chair, IEEE SPS, GS.

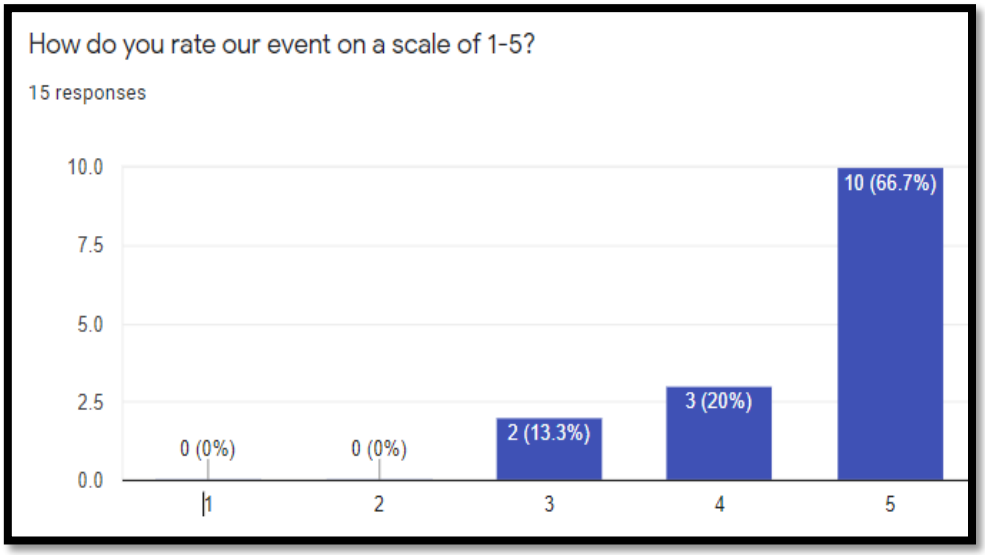
Team Ranking and Prize Distribution:

First Prize Rs 11,000/-	**Team Leader:** Poojan Dalal **Mentor:** Prof Chirag Paunwala	Sarvajanik College of Engineering and Technology
Second Prize Rs 7,000/-	**Team Leader:** Mr. S. Avinesh **Mentor:** Prof. I. J. Selvakumari Jeya	Hindusthan College of Engineering and Technology
Third Prize Rs 4,000/-	**Team Leader:** Saqlain Shaikh **Mentor:** Prof Vandana Shah	Sarvajanik College of Engineering and Technology
	Team Leader: Neel Majethiya **Mentor:** Prof Sarosh Dastoor	SVNIT Surat.
Consolation Prize Rs 2,000	**Team Leader:** Chirag Jariwala **Mentor:** Prof Sarosh Dastoor	Sarvajanik College of Engineering and Technology
	Team Leader: Neel Khapara **Mentor:** Prof Ketki Pathak	Sarvajanik College of Engineering and Technology

- All the Participants were provided with the Certificate of Recognition.
- Prof. Nehal Shah honoured the winners with their prizes and motivated them to further cherish the life-long opportunities.
- Prof. Chirag Paunwala revealed a surprise that all the teams of final round be given the opportunity of direct entry (Wild Card entry) to the Semi-Final Round of the extended (higher-level) Version of the competition, Data Science Challenge, to be organised at R-10 (Asia-Pacific Region) Level.

Feedback from the participants (Teams):





The links to be accessed for Data Science Challenge – 1.0 are:

1) https://ieeespsgs.org/data-science-challenge/

(Link for accessing the event website)

2) https://bit.ly/Data-Science-Challenge-21 (Link for registration)

3) spssb@scet.ac.in (For any queries)

4)https://drive.google.com/file/d/1YwznVhVgWVf0RSlwwcKBZSTH0mflLUDf/view?usp=sharing (Link for accessing the Final round Recording of the Event)

Jury Members:

1) Dr. Mita Paunwala:

Dr. Mita Paunwala is Dean Alumni and Associate Professor at CKPCET. She is the Vice-Chair IEEE SPS, Gujarat Chapter.

2) Dr. Samya Muhuri:

Dr. Samya Muhuri is working as an Assistant Professor at Bennett University. He did his Ph.D. from the Indian Institute of Engineering Science and Technology, Shibpur (IIESTS) in August 2020. Prior to joining Bennett, he taught at the National Institute of Technology, Sikkim. His research interests focus on Social and Complex Network Analysis, Data Mining, and Digital Humanity.

3) Mr. Bhaumik Vaidya:

Mr. Bhaumik Vaidya is an experienced computer vision engineer and a mentor. He has worked extensively on OpenCV and Tensorflow Library in solving computer vision problems specifically in the medical and automobile domain. He is a University Gold medalist in PG and pursuing his Ph.D. in the acceleration of computer vision algorithms built using OpenCV and deep learning libraries like Tensorflow and Keras on GPUs.

4) Dr. Manish Khare:

Dr. Manish Khare is working as an Assistant Professor in DAIICT. He received his D.Phil. degree in Computer Science from University of Allahabad, in 2015. He completed M. Tech. degree in Computer Science and Engineering from CDAC, Noida. As a Post-Doctoral Fellow, he worked in the Department of Electrical Engineering and Computer Science, Gwangju Institute of Science and Technology, Gwangju, Republic of Korea, in 2016-1017.

Sarvajanik College of Engineering and Technology,Surat

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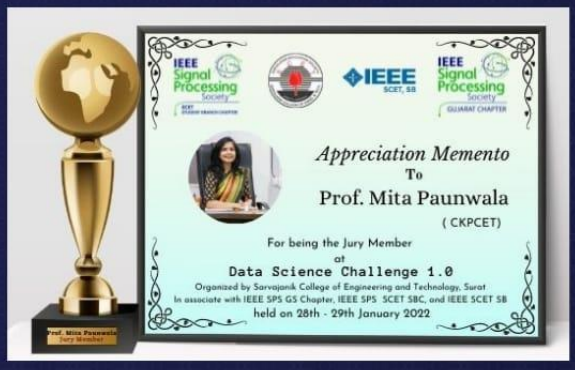
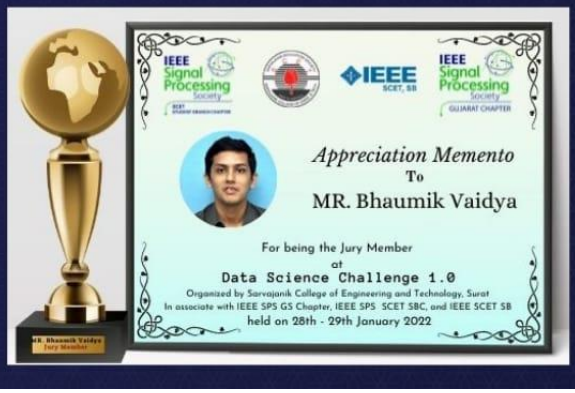
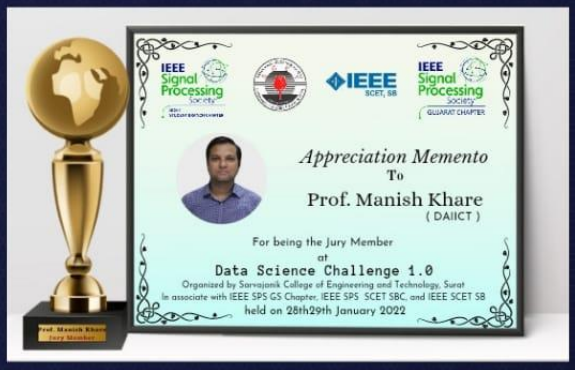
28th and 29th January 2022

Thank You Jury Members







Winners:

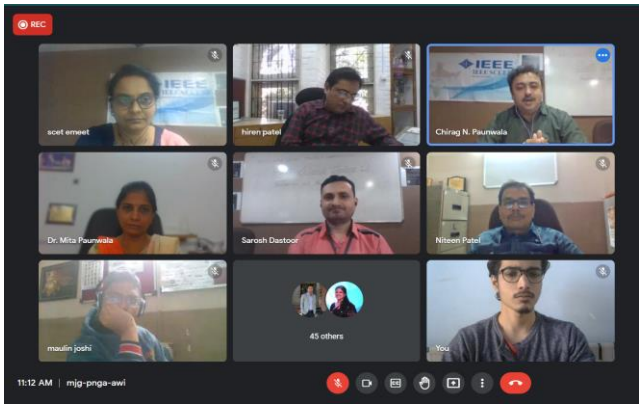
1st Prize

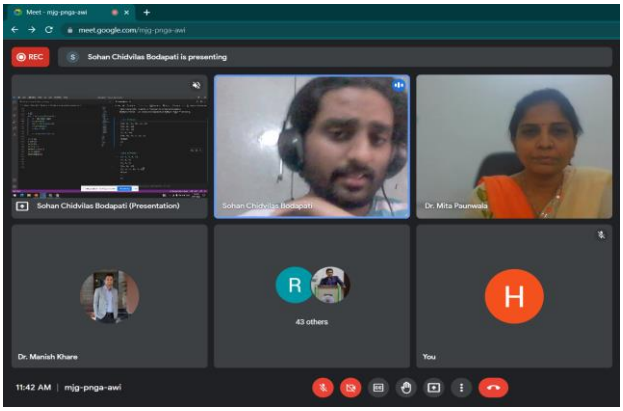
2nd Prize

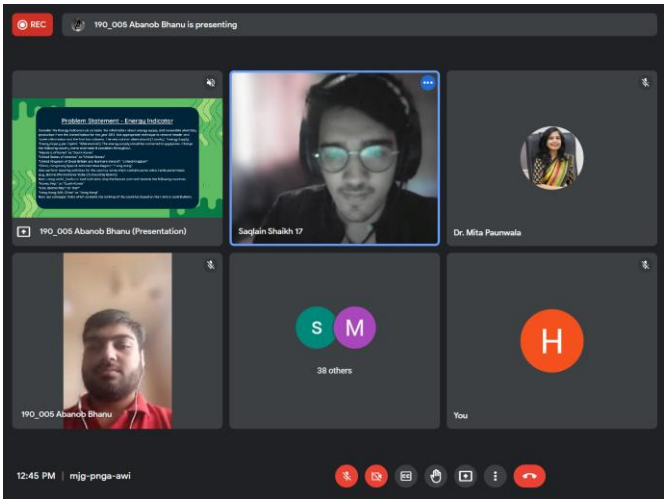
3rd Prize

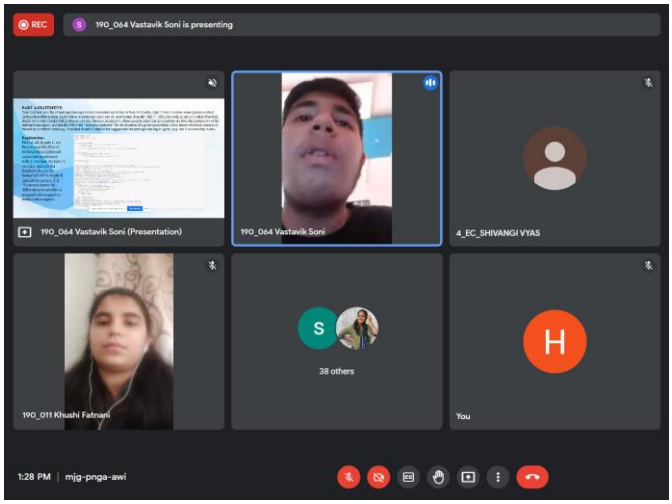
Consolation Prize

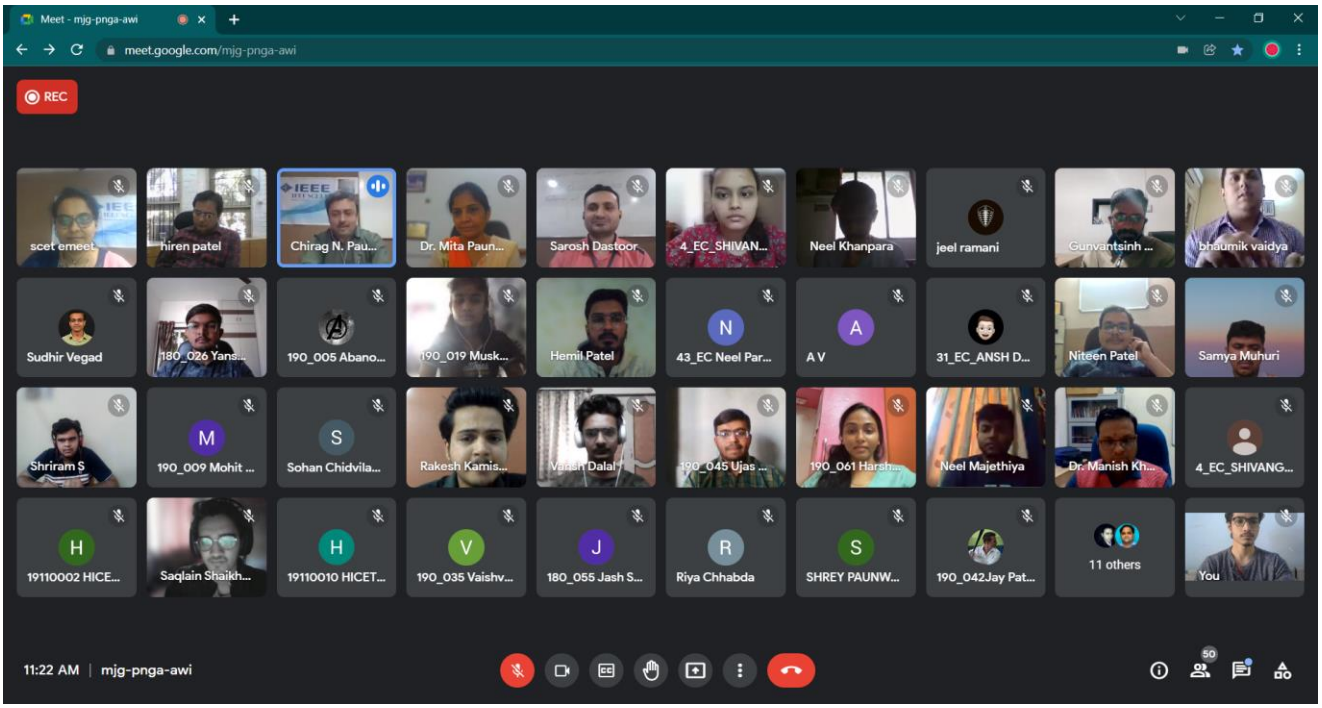
Some glimpses of the event have been appended below in the form of snaps:

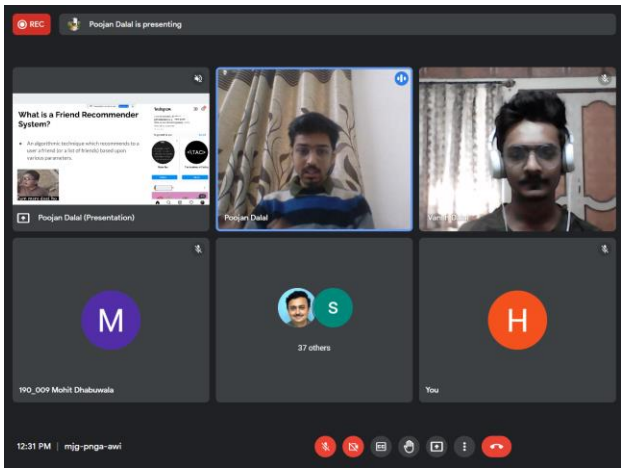


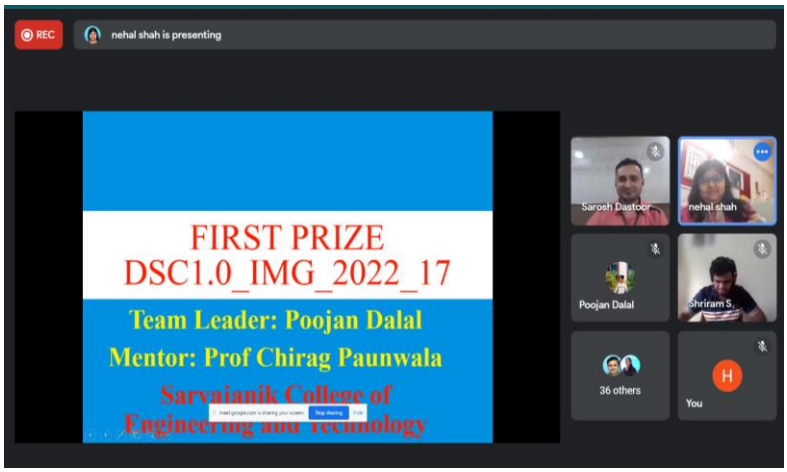


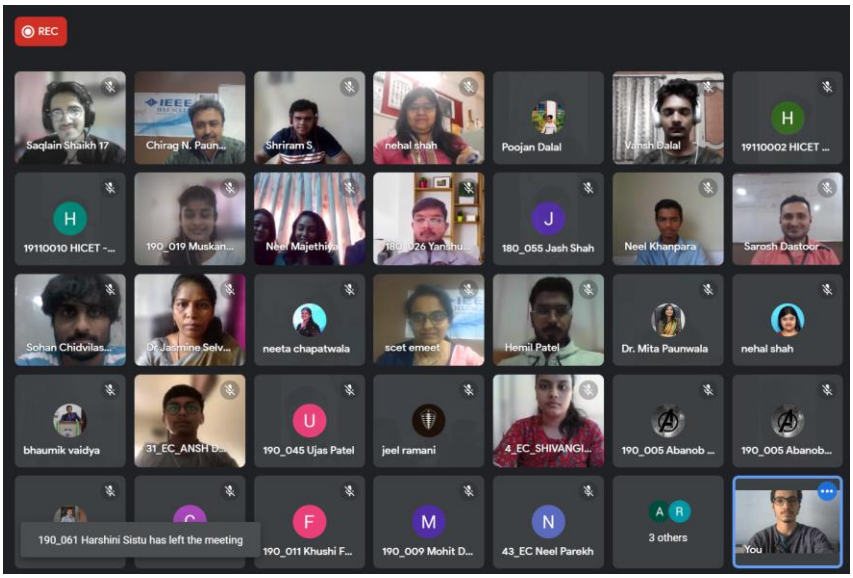












Report Compiled by: Prof. Sarosh Dastoor and Hetav Raval-IEEE SCET SPS SBC Chair.