



IPRECON 2021

2021 IEEE International Power and Renewable Energy Conference

2nd edition of India's first IEEE Club of 6 Technical Paper Conference

Technical Co-Sponsors





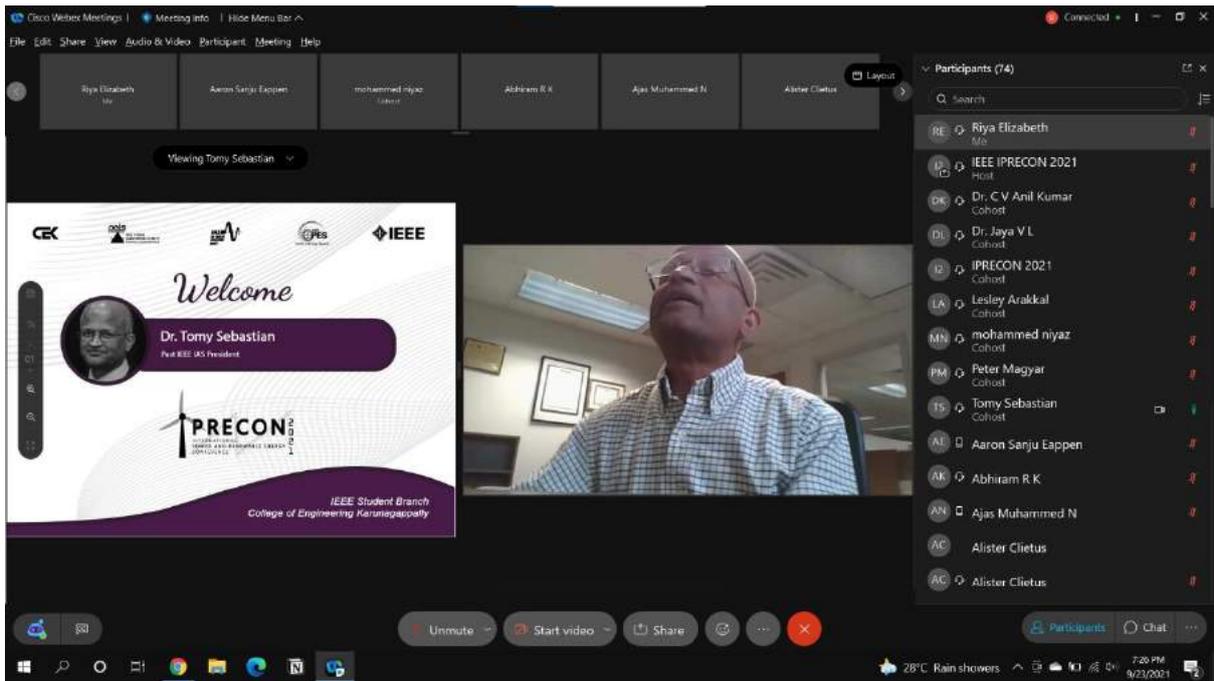
2021 IEEE International Power and Renewable Energy Conference (IPRECON) is the 2nd edition of India's first & only IEEE IAS Club of 6 Technical Paper Conference organized by IEEE Student Branch College of Engineering Karunagappally (IEEE SB CEK), technically sponsored by IEEE IAS, IEEE PES and IEEE PELS.

The inauguration of the IEEE International Power and Renewable Energy Conference 2021 organised by College of Engineering Karunagappally was held on the 23rd of September, 2021. The comparing was done by Mr. Mohammed Niyaz , IAS vice chair , IEEE SB CEK .

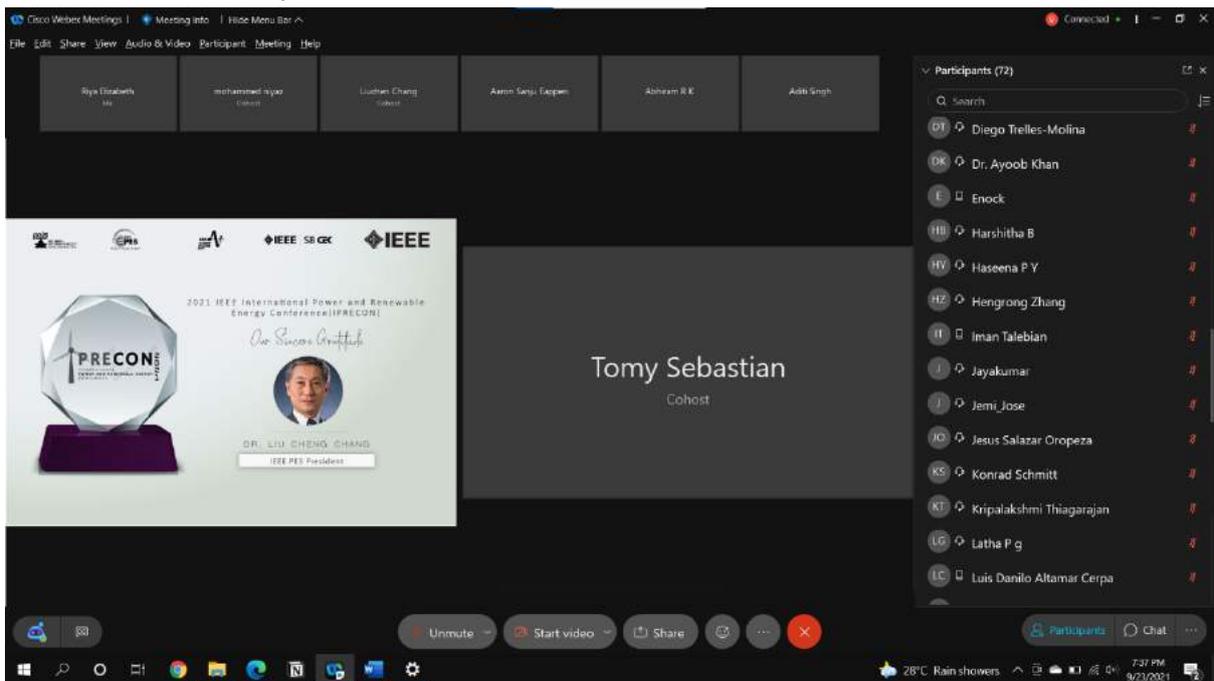
The ceremony was flagged off with the IEEE code of Ethics by Mr. Cliffin Cletus , Chair IEEE NPSS/PELS Jt. Chapter IEEE SB CEK . The IEEE code of Ethics was followed by a minute of silence for the late Dr. Frank Lambert who served as the 2020-2021 PES President who unfortunately passed on the 27th of July , 2021 . Frank had been actively involved in PES Technical Activities since 1982, serving on a variety of Working Groups in both the PES Distribution Subcommittee and PES Switchgear Committee.

The welcome Address of the inauguration was given by Ms. Riya Elizabeth, General Chair IPRECON 2021. A video presentation about IEEE Student Branch College of Engineering Karunagappally was played to showcase the student branch's achievements till date which included 60 awards and more than a 100 recognitions and multiple volunteers grabbed more than 50 travel grants and 10 travel grants abroad. After the video presentation, Ms. Amitha A Nair, General Chair, IPRECON 2021 was called upon for the Presidential Address. Ms. Deepa Girija Pillai, Technical Chair, IPRECON 2021 was invited to present the speak about the conference IPRECON 2021 , Through IPRECON we were able to provide a platform for students and professionals from all around the world to share their findings in the fields of Power, Renewable Energy and Computing Technologies. With the theme "Engineering the sustainable world with Renewable Energy Resources through ingenious computing technologies"

The inauguration and the inaugural address was done by Dr. Tomy Sebastian, Past IEEE IAS President. His opening remarks were noticeable and encouraging and congratulated IEEE Student Branch College of Engineering Karunagappally for organizing the Club of 6 Student Led Technical Paper Conference in India.



The felicitations were done by, Dr. Liuchen Chang, IEEE PELS President, opened up his views on the amazing step put forward by IEEE SB CEK and wished for the successful completion of the conference. He also drew our attention to PES (POWER ELECTRONICS SOCIETY), then he mentioned about EBL-II, a global competition aimed at fostering innovation to develop solutions to electricity access.

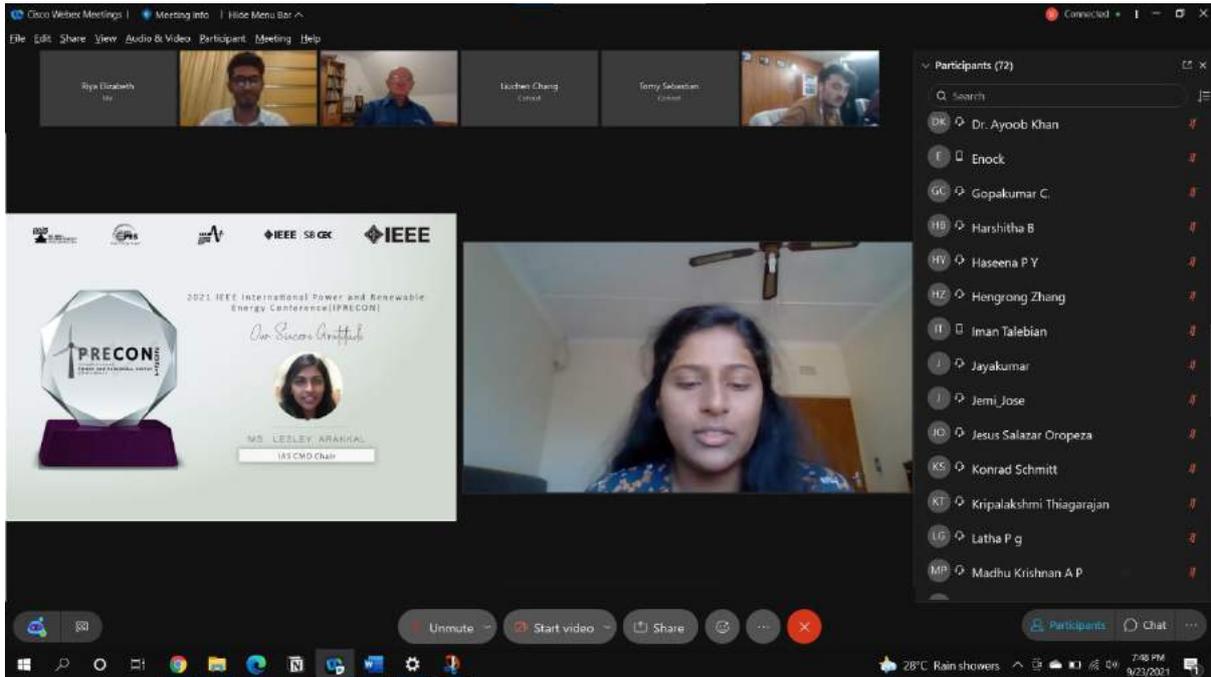


Dr. Ing Peter Magyar, Past IAS CMD Chair, expressed his dynamic views on the potential of the student branch as he also mentioned about his previous experience with its members . His support to the student branch has been so massive and he promised to provide additional support in the upcoming events organised by the SB .

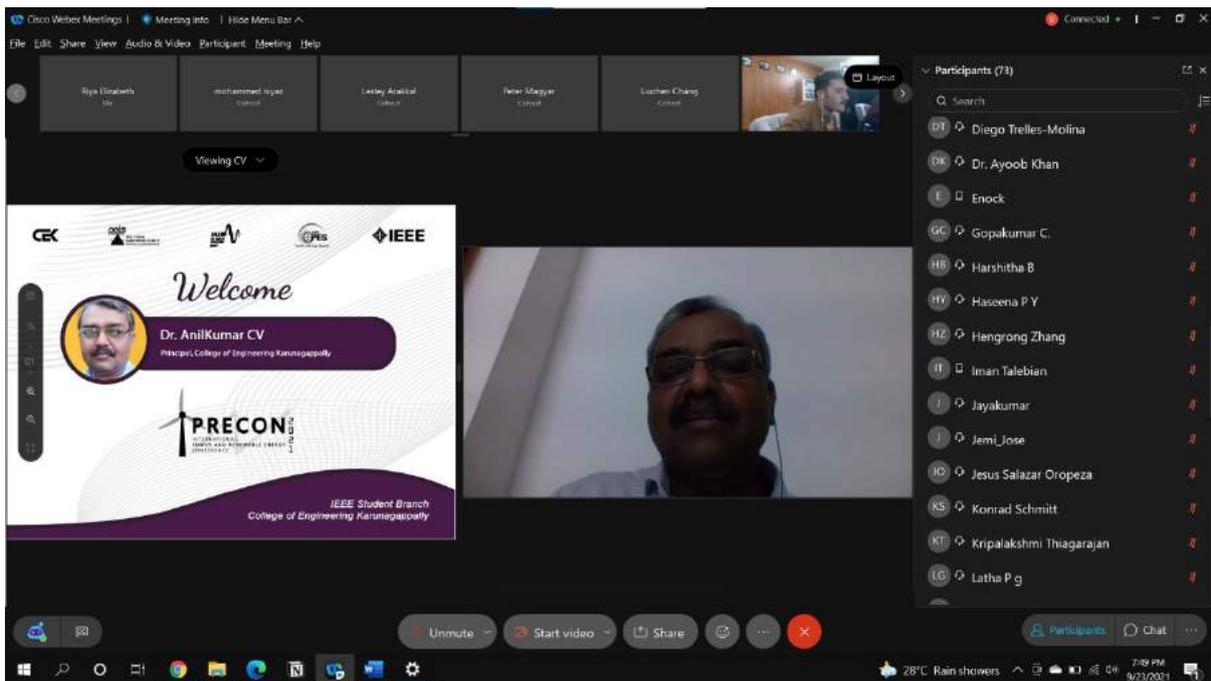
The image shows two screenshots from a Zoom meeting. The top screenshot displays a welcome slide for Dr. Ing Peter Magyar, Past IAS CMD Chair, with logos for CEK, IEEE, and the IEEES Student Branch. The bottom screenshot shows a shared slide titled "Plug-in hybrids - a comparison" with a table of data.

Type / Basic price	Engine power, gasoline / electro	Battery, kW	Electrical distance Nominal / Best test Charging time, 220V
Opel Grandland X Hybrid 4 51,105 EUR	149 kW / 82 kW+84 kW	13.2	59 km / 42 km 8 h
Volvo XC40RS Twin Engine 50,000 EUR	134 kW / 61 kW	10.7	45 km / 36 km 5 h
Peugeot 508 SW H 225E AETS 49,450 EUR	134 kW / 82 kW	11.5	52 km / 38 km 6.5 h
Passat Variant GTE TSI 4x4 65,635 EUR	139 kW / 86 kW	13	55 km / 38km 6.5 h

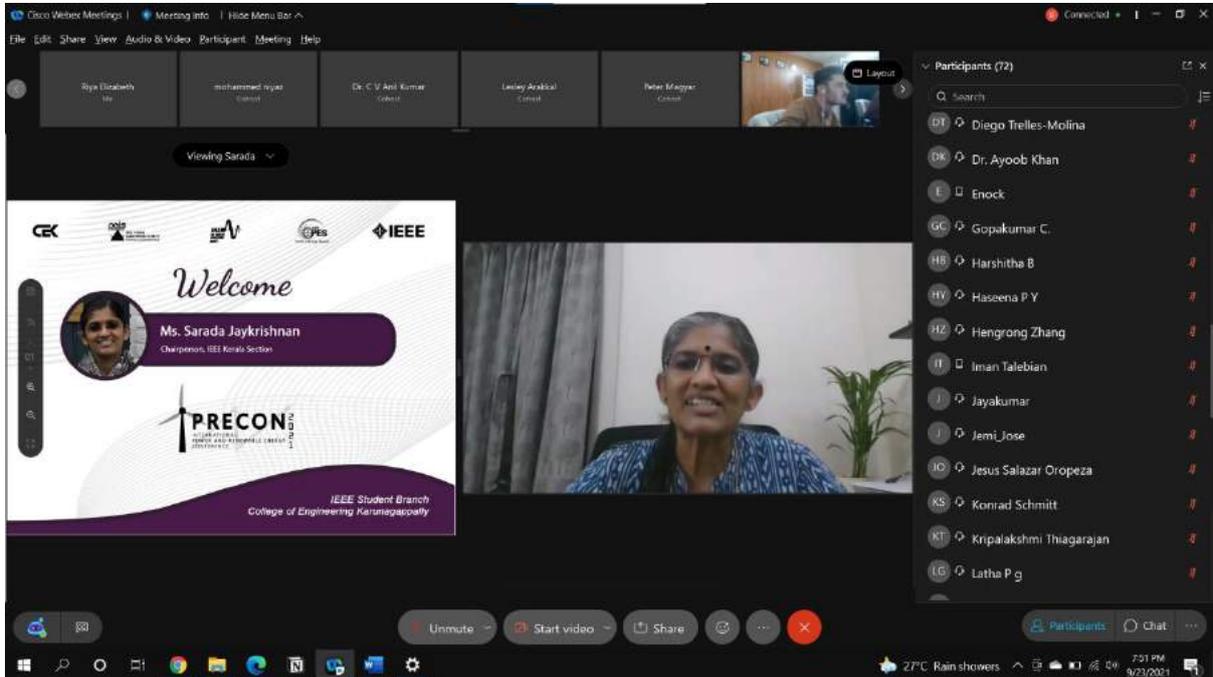
Ms. Lesley Arakkal, IAS CMD Chair, Congratulated the entire organizing committee for the amount of work the student branch has put forward to a conference of this scale.



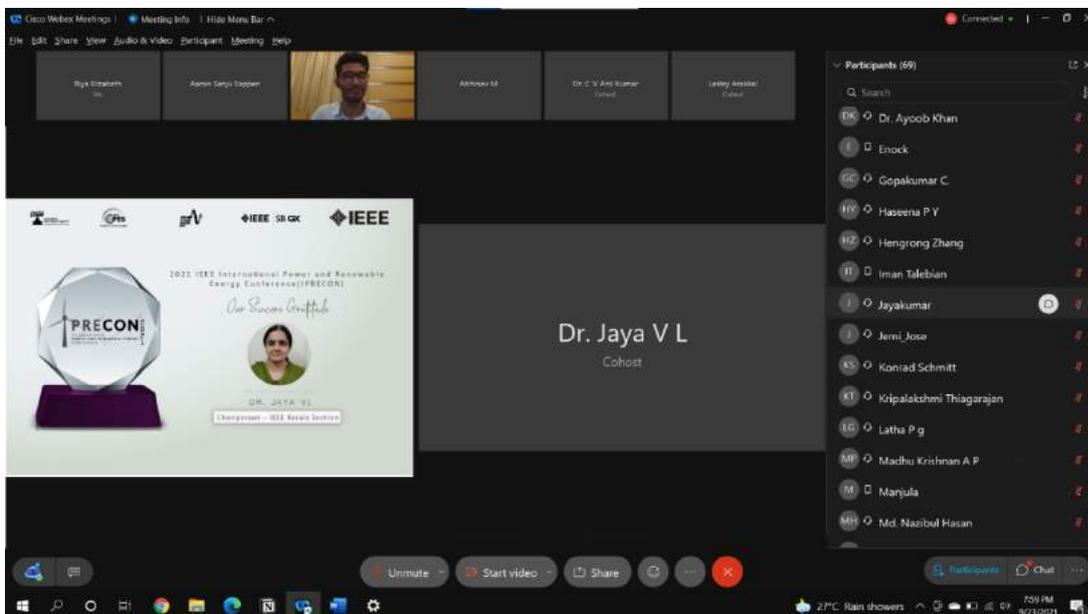
Dr. AnilKumar CV, Principal, College of Engineering Karunagappally , showed his valuable presence in the ceremony wishing the student branch for a successful completion and promised all means of support.



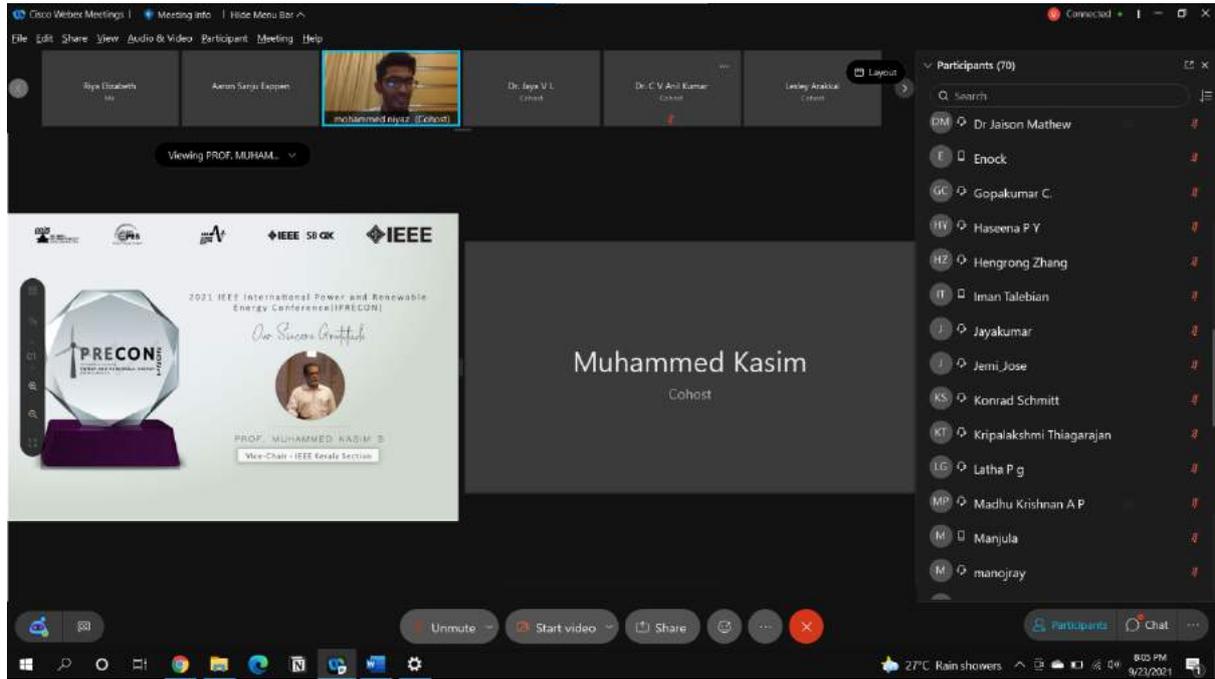
Ms Sarada Jaykrishnan, Chairperson IEEE Kerala Section , expressed her views on the prestigious student led international paper conference organised by IEEE SB CEK under Kerala section for the second year in a row .She congratulated the entire team for this event she was very much excited on this student led conference, she also took time to mention about the humanitarian activities from the humanitarian track from the schedule which she says it is always welcoming for a session of IEEE.



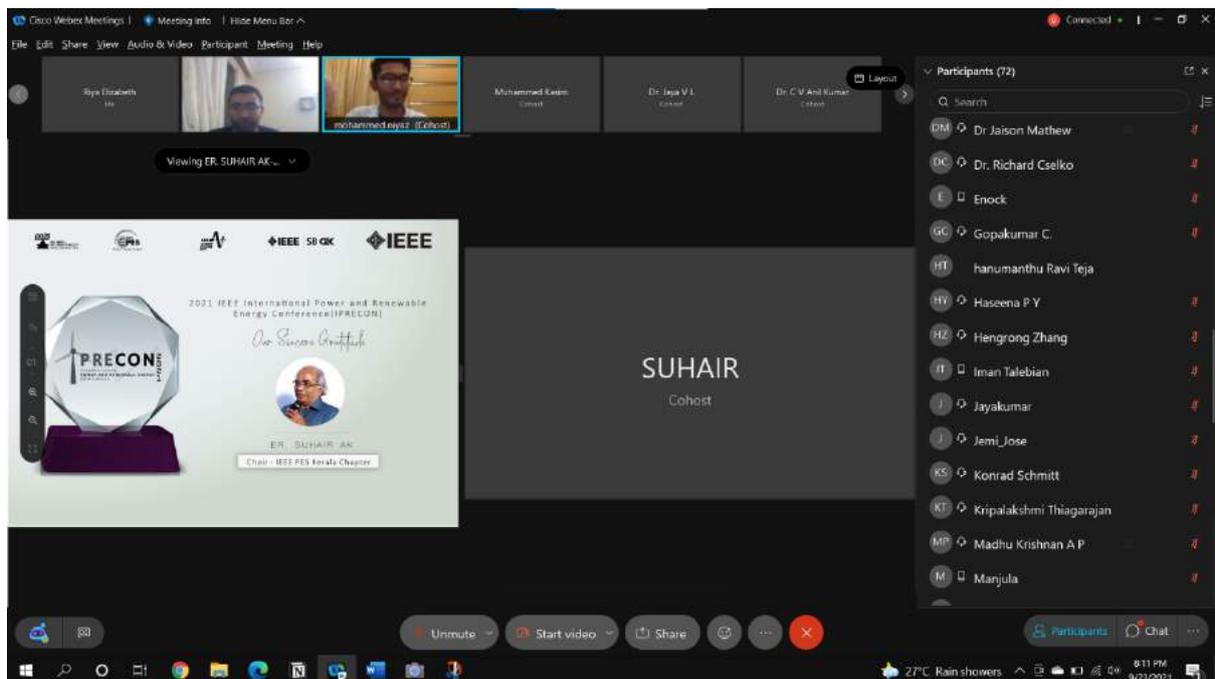
Dr. Jaya VL, Former Principal, College of engineering Karunagappally , conveyed her best regards for the successful completion of the event and wished all the authors and organisers the best of luck throughout the event .



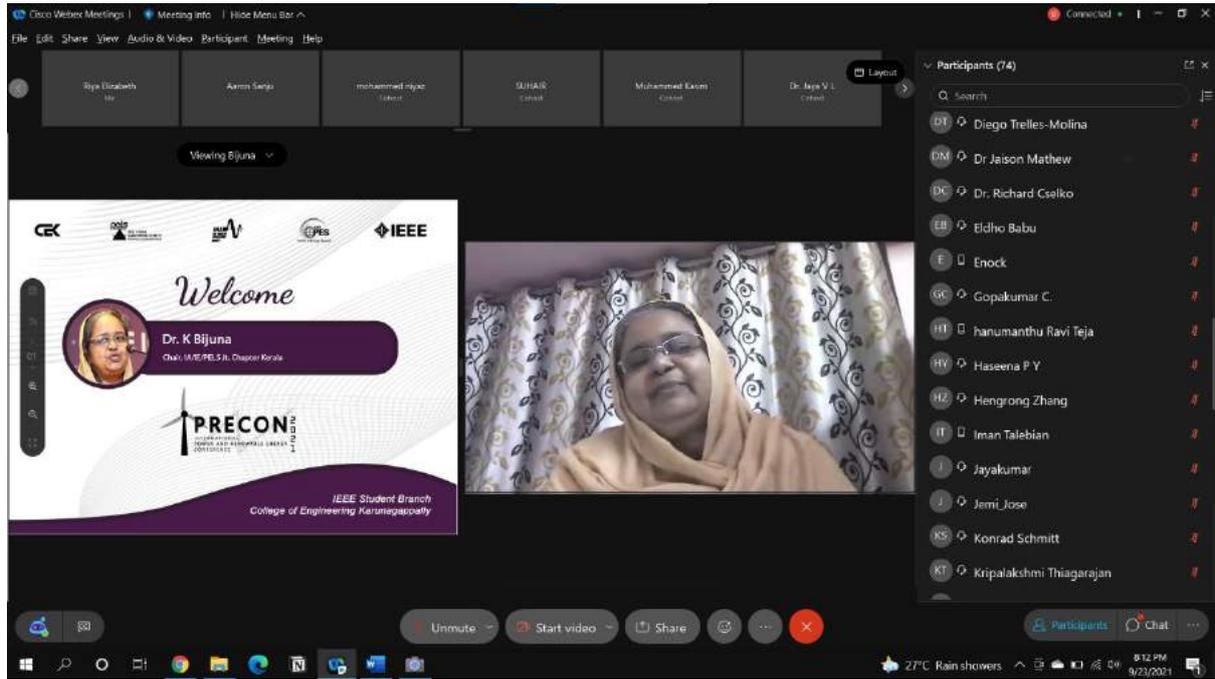
Prof Mohammad Kasim S, Vice Chair, IEEE KERALA Section, shared his views on the student led platform set up by the Student Branch for various authors across the world and country to present their respective papers .



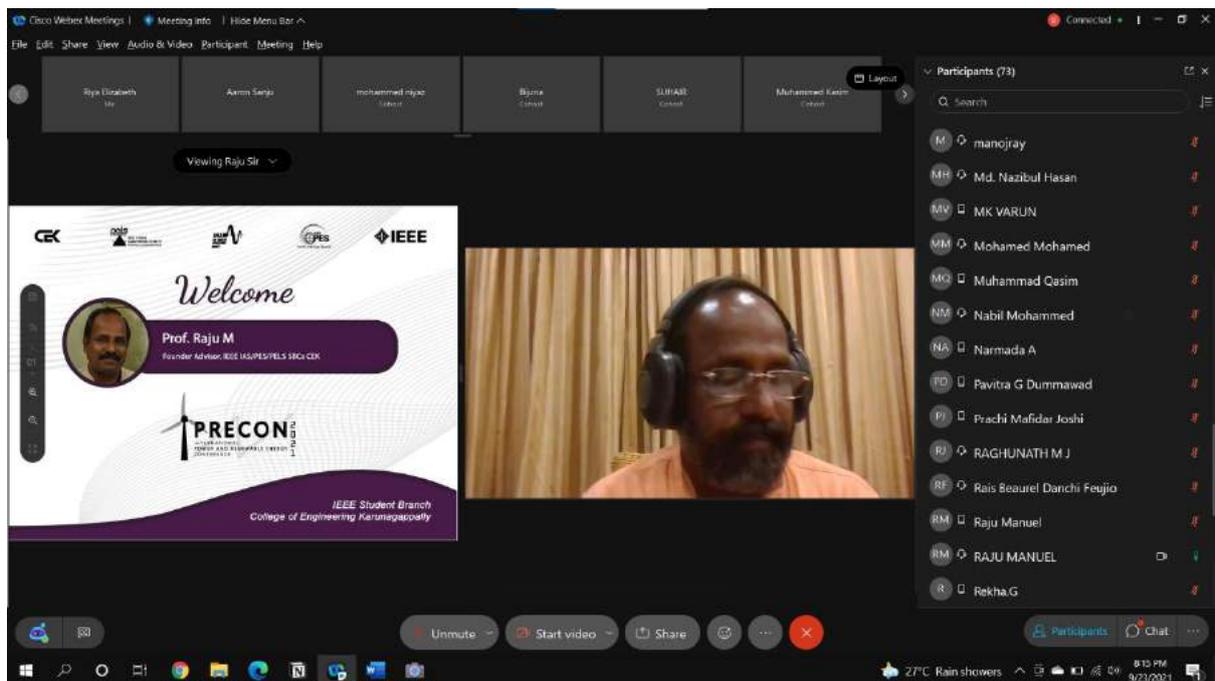
Er. Suhair AK, Chair IEEE PES Kerala Chapter, opened up about the consistent performance of the student branch and wished the best for the event to turn out successful.



Dr. K Bijuna, Chair IA/IE/PELS Jt. Chapter Kerala, congratulated the student branch for organizing the CLUB of 6 Technical Paper Conference in India under Kerala Section for the second year in a row.

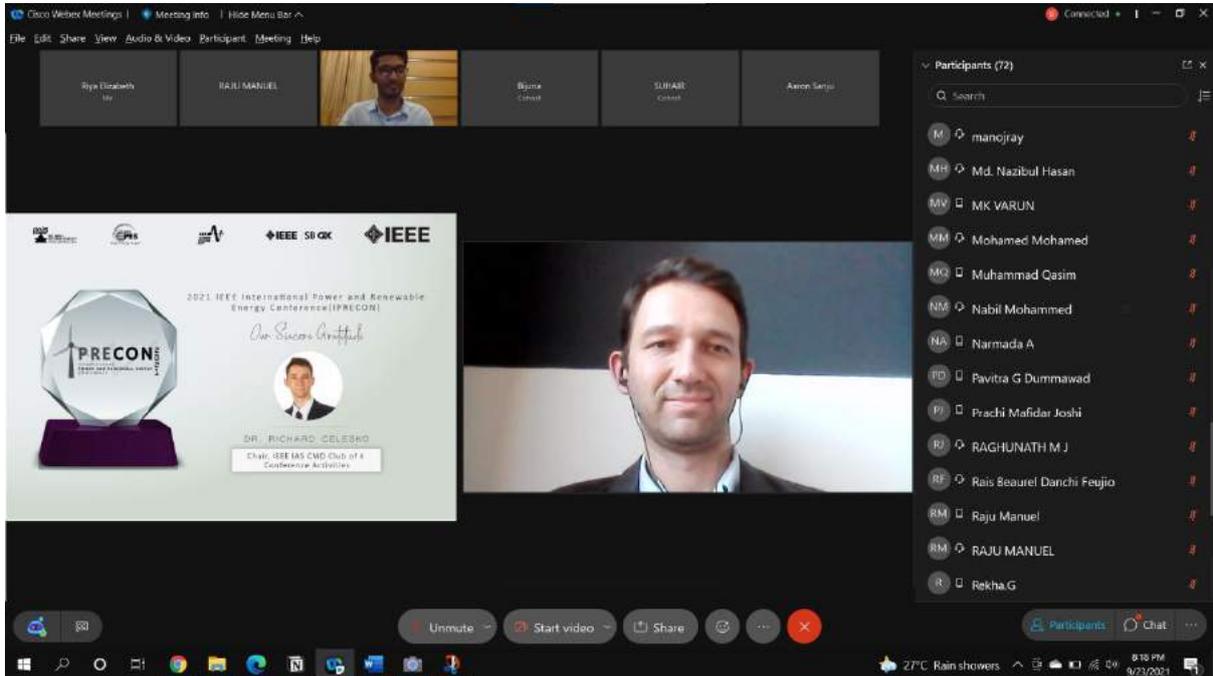


Prof Raju M, Founder Advisor IEEE IAS/PES/PELS Student Branch Chapters, expressed his complete support and guidance to the student branch and gave about positive remarks and pointers for an enhanced performance throughout the event

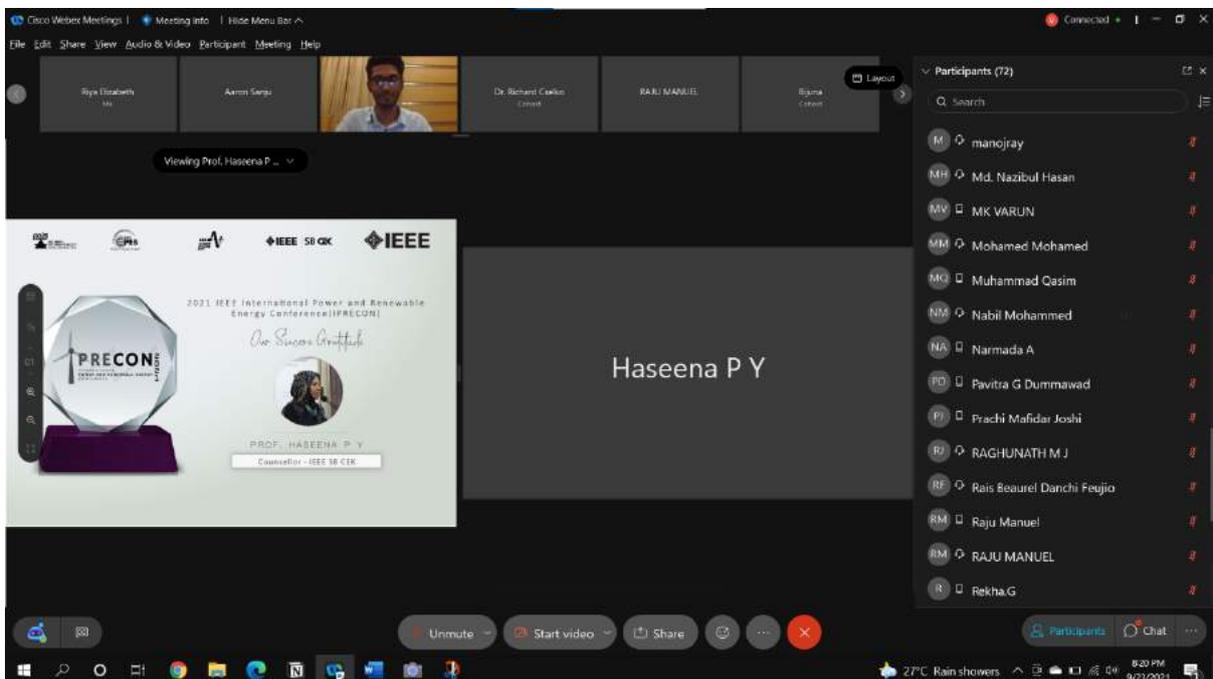




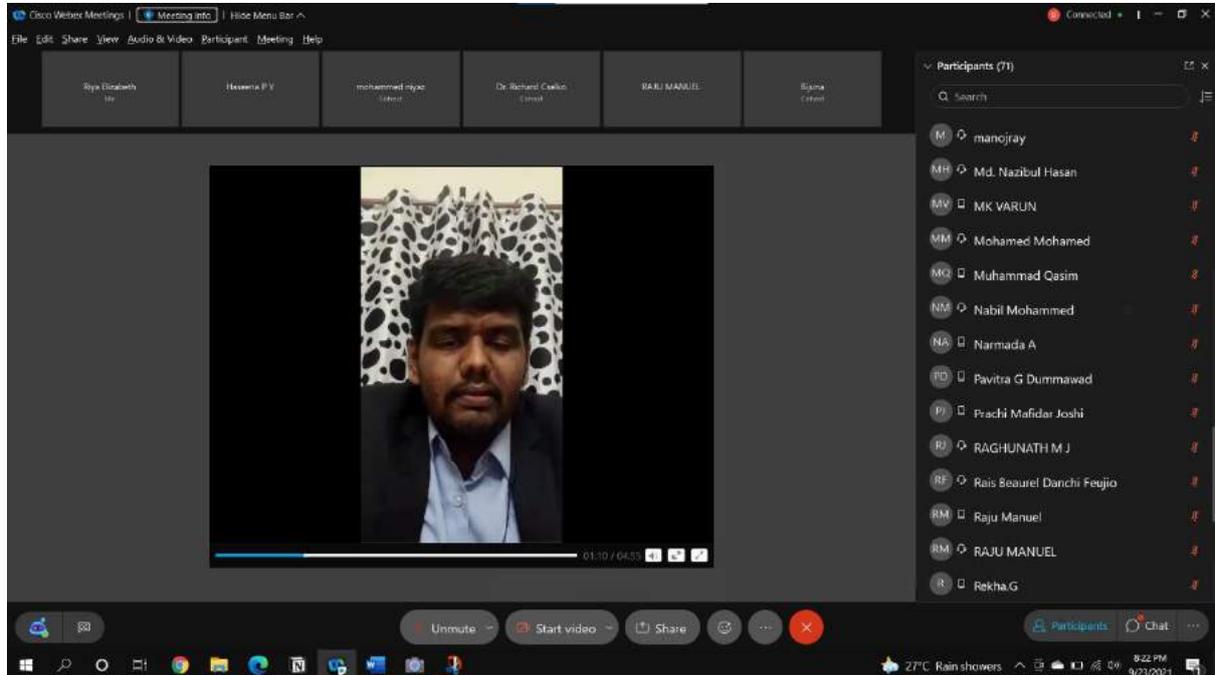
Dr. Richad Cselko, Chair IEEE IAS CMD CLUB OF 6 conference activities, showed his active presence throughout the ceremony and congratulated the student branch in organising IPRECON for a second year in a row and wished the student branch the best regards to have a successful event



Prof. Haseena PY, Counsellor, IEEE Student Branch College of Engineering Karunagappally, congratulated the whole organising team and thanked all the guests for attending the ceremony. She also promised her entire support and guidance for the future events.



Finally, the vote of thanks was given by Mr. Hari Krishnan A, Publication Chair, IPRECON 2021. IPRECON 2021 was successfully able to exceed everyone's expectations. Everyone involved in the conference had quite an exhilarating time as were evident by their reviews. It was indeed the beginning of the CLUB OF 6 Conferences in India and IEEE SB CEK takes immense pride to be the one to come up with such an endeavour. IPRECON 2021 enlightened not only the youth, but even the professionals into a path of diverse technical advancements and was indeed a full-fledged conference



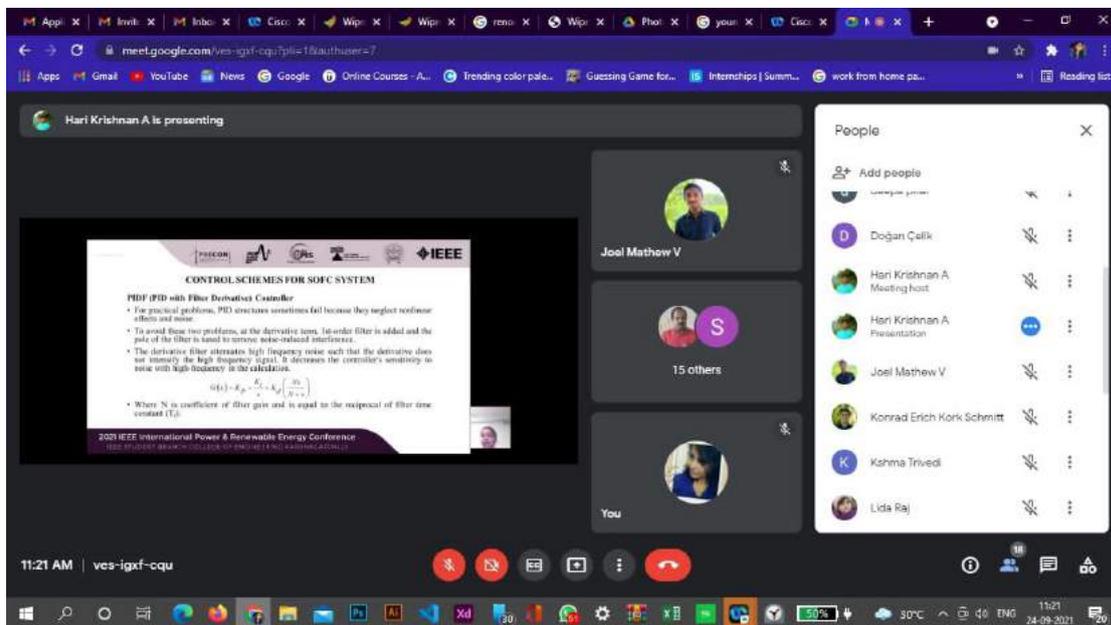
With that, the opening ceremony of IPRECON 2021 came to an end.

Day 1

IEEE International Power and Renewable Energy Conference organized by IEEE Student Branch College of Engineering Karunagappally in association with IEEE Industry Applications Society came to end on 26th September after three days of incessant Activities and prolific deliberations of interesting as well as informative ideas. Due to the pandemic the virtual platform has been opted for the conference.

The day 1 of IPRECON 2021 mainly consisted of technical paper presentations which were carried out in 2 sessions with 3 parallel tracks on both sessions. At sharp 9:30 am IST the curtain for the first session "**Power electronic converters and control system**" was raised. The session chair was Nabil Mohammad, Ph.D. Scholar, Monash University, Australia.

Then the most awaited presentation session started with the first track of presentations with the paper “Review and comparative study of Bi-Directional DC-DC Converters” by Mr. Gottapu Lithesh Kumar and his team. There were also several more presentations in the session from various classes of division, which all are much informative, interesting, and highly vibrant with the interaction of presenters, students, research scholars, and professionals. It concluded with the SB offering a token of praise to the session chair through a memento.



The second track of the paper presentation was on “**Electric Machines and Drives and Power Quality Issues**”. The session chair was Mr. Antony Peter, Ph.D. Scholar, Electrical engineering, Government engineering College Thrissur. The session concluded at 12.30 PM IST by appreciating all the authors and presenters for their hard work and research and the session chairs were rendered a memento each for their cooperation and support.

Paper 110

Ciffin Cletus is presenting

Optimization

- Objective Function**
 $\max(TF_{avg}, TFD) \text{ and } \min(F_p, TF_{rp}, THD)$
- Constraints:**
 $TF_{avg} \geq 15221 \text{ N.TFD} \geq 263 \text{ kN/m}^2$
 and $TF_{rp} \leq 50.36 \text{ N}$
 Split Ratio: $0.1828 \leq S.R. \leq 0.2903$
 PM width: $3.25 \leq w_{pm} \leq 5.1$
 PM height: $17.80 \leq h_{pm} \leq 26.60$
 Flux bridge width: $0.5 \leq w_{fb} \leq 1.5$
 Stator pole width: $3.0 \leq w_{sp} \leq 10.0$

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11:39 | uov-dpag-dif

Paper 65

Ciffin Cletus is presenting

Electric Vehicle Integration Block Diagram

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10:56 | uov-dpag-dif

31°C Light rain 10:56 AM 9/24/2021

Paper 101

Finite Element Model

Main Characteristics of the Motor				
Number of	Phases	3	Stator Resistance(Ω)	1.176
	Pole Pairs	2	Stator Inductance(H)	31e-5
Stator Slots	Winding Configuration	24	Winding Configuration	Concentric Winding
	Airgap (mm)	0.503	Core type	Silicon Steel
Rotor Outer Diameter (mm)	70	Magnet Type	NdFeB	
Stack Length (mm)	50-308	Frequency (Hz)	50	

Geometry design of the surface permanent magnet synchronous motor

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Paper 30

in-call messages

wasiq ulah 10:10
Sir, there is no voice of the presentation

Cliffin Cletus 10:11
Are you able to hear audio now?

You 10:11
yes

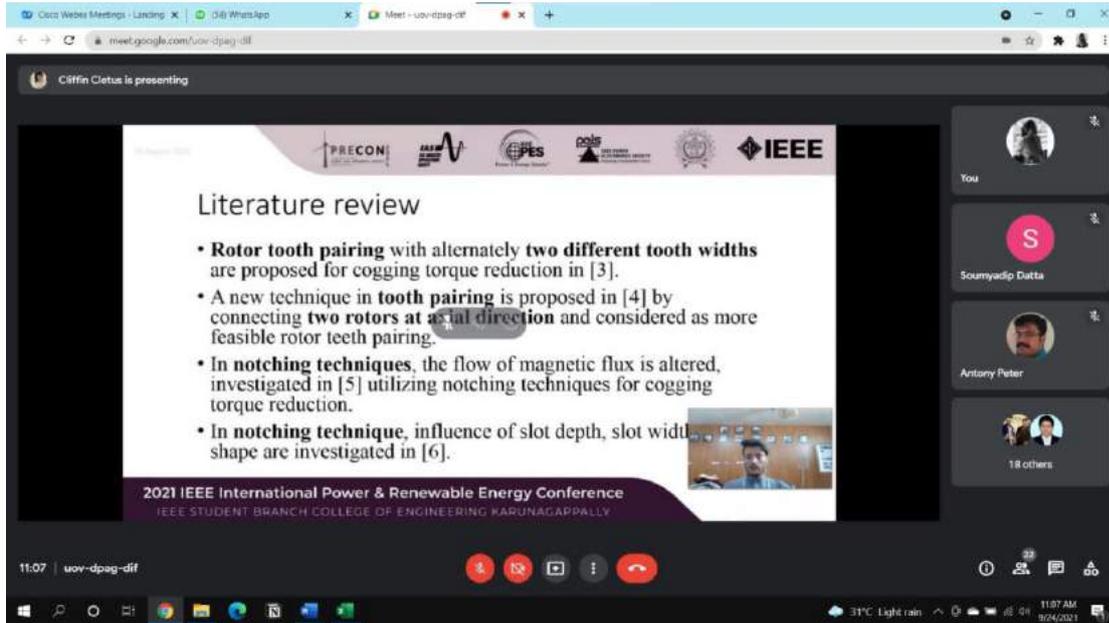
wasiq ulah 10:11
no sir

You 10:12
Guidelines:
- A total of 15 minutes will be assigned for each team. Out of which, 12 mins is for the presentation and 3 for discussions.
- If the attendees have any question regarding the paper, you may use the chat box to post your questions.

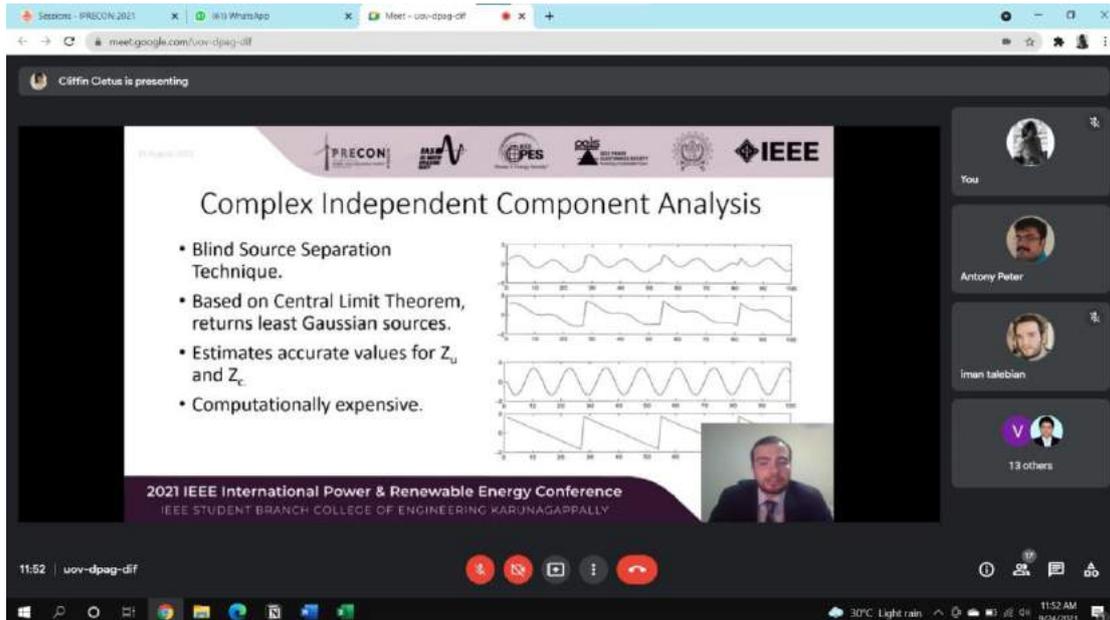
Sidhi Ashasthaji 10:12
Sir, please check your connection. It's audible

[Send a message to everyone]

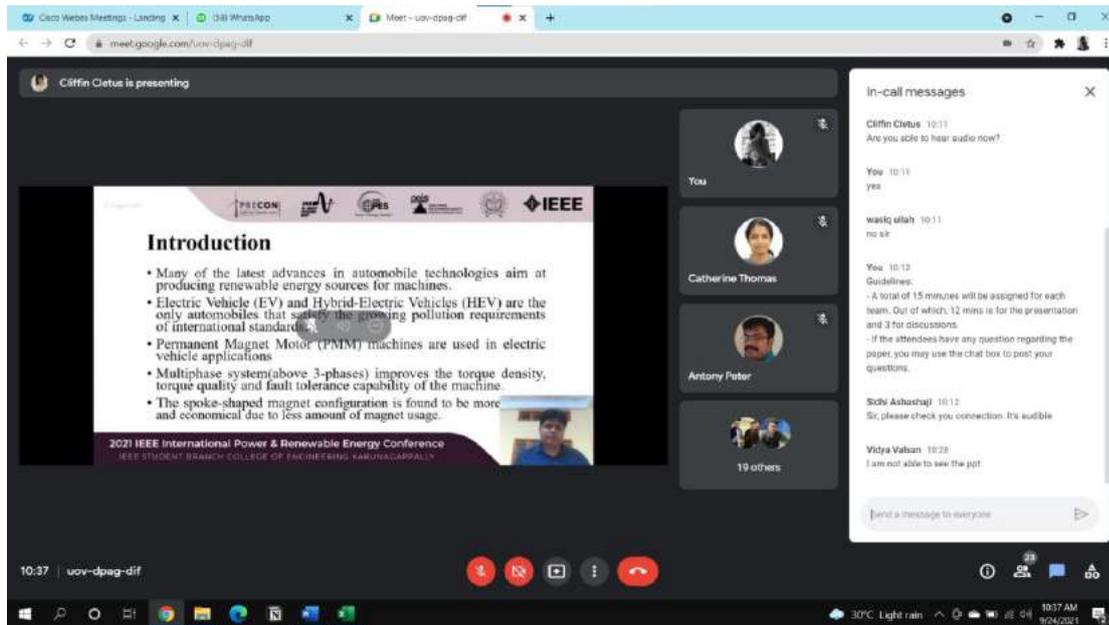
Paper 84



Paper 53

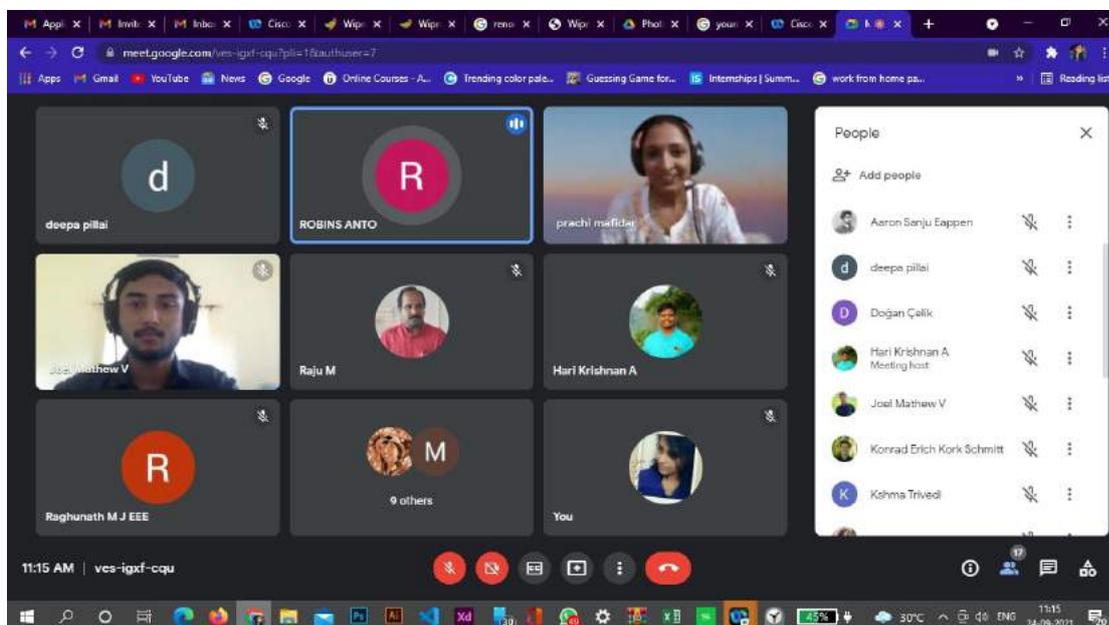


Paper 51



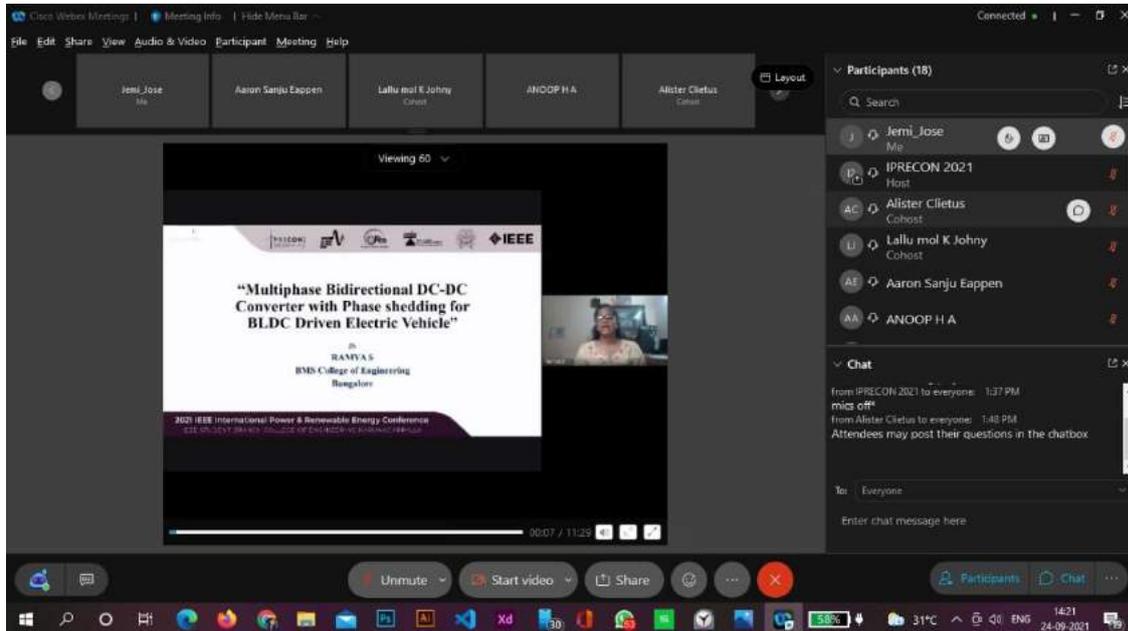
The third track of the paper presentation was on "**Renewable Energy Resources**". The session chairs were Mr. Raju Manuel, Ph.D. candidate with, Department of Electrical and Electronics Engineering, Karpagam Academy of Higher Education, and Mr. Robins Anto, research scholar with the Department of Hydro and renewable energy, IIT Roorkee. The session concluded at

12.30 PM IST by appreciating all the authors and presenters for their hard work and research and the session chairs were rendered a memento each for their cooperation and support.



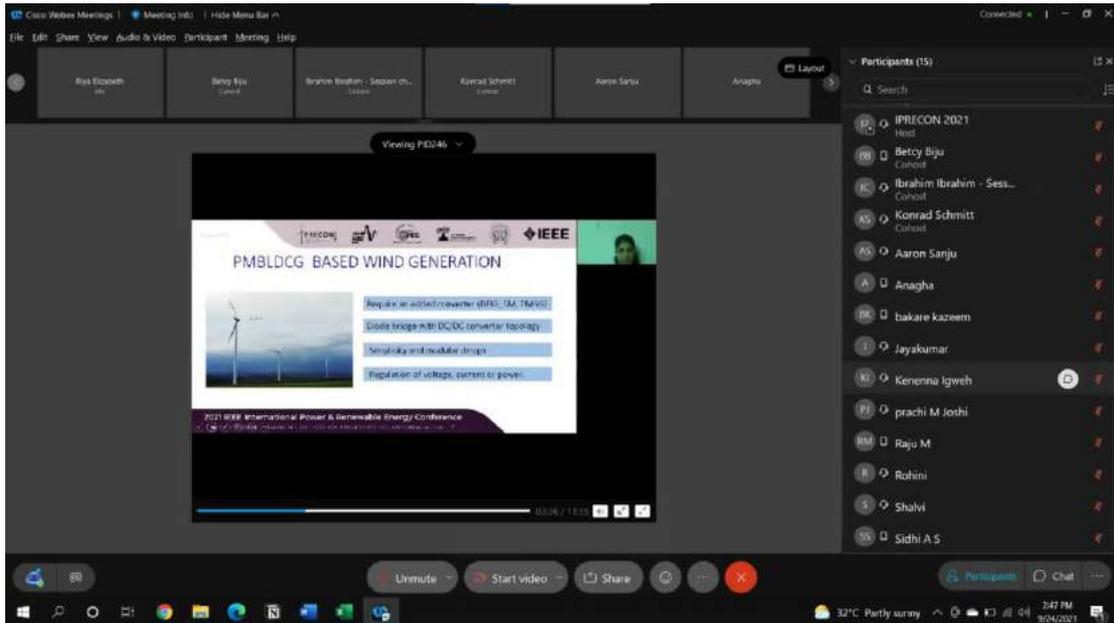
The next session was started at 1.30 PM IST with three tracks of papers and was concluded at 4.30 PM IST.

The fourth track consisted of papers on "**Electric Vehicles**". The session chairs were Ms.Lallu Mol K Johny, Ph.D. Scholar, APJ Abdul Kalam Technological University, and Mr. Sanoop P S, Ph.D. Scholar, National Institute Of Technology, Calicut. The track was concluded at 4.30 PM IST, appreciating all the authors and presenters for their hard work and research, and the session chairs were rendered a memento each for their cooperation and support.

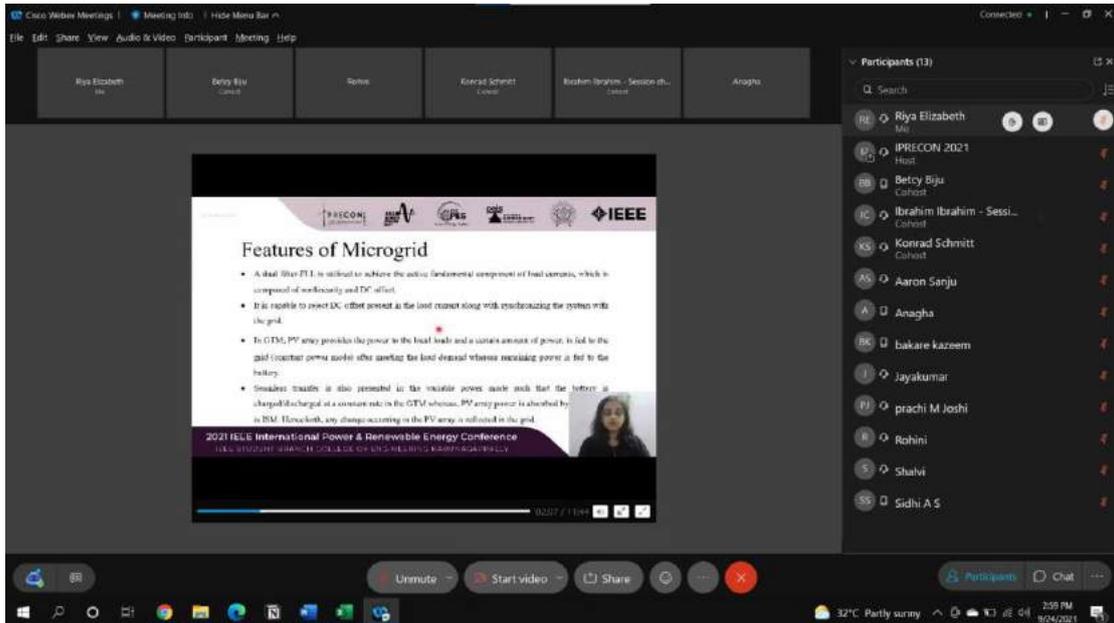


The fifth track was on "**Distributed Generation and Grid Interconnection**". The session chairs were Mr. Konrad, Ph.D. scholar, Texas Technical University, and Mr. Ibrahim A Ibrahim, Electrical Engineering Ph.D. Student at Texas Tech University. The track was concluded at 4.30 PM IST, appreciating all the authors and presenters for their hard work and research, and the session chairs were rendered a memento each for their cooperation and support.

Paper 246



Paper 261



Paper 222

Viewing PQ222

ENERGY MANAGEMENT TECHNIQUE

2021 IEEE International Power & Renewable Energy Conference (IPRECON 2021)

Participants (17): Betsy Biju, Ibrahim Ibrahim - Sess..., Konrad Schmitt, Aaron Sanju, Anagha, Anjana Aruldas, bakare kazeem, Jayakumar, Kenenna Igweh, prachi M Joshi, Raju M, Rohini, Shalvi, Sidhi A S.

31°C Light rain

Paper 243

Viewing PQ243

PROPOSED ISLANDING DETECTION TECHNIQUE

- The adaptive neuro-fuzzy inference system (ANFIS) is adopted in this paper for DG islanding detection. The integration of fuzzy logic and neural network addresses shortcoming in using only neural network or fuzzy logic alone.
- Fuzzy logic systems are subjective, this means that the determination of fuzzy rules, functions depend on trial and error. The integration of the ANFIS and the FS systems overcomes this downside.
- The ANFIS islanding detection method applied in this paper is based on the passive islanding detection concepts and methods.
- The parameter selection, besides inputs to the ANFIS network are the Rate of Change of Frequency (ROCOF), Rate of Change of Power and voltage measured as at the FCC of the DG.

2021 IEEE International Power & Renewable Energy Conference (IPRECON 2021)

Participants (15): Rlys Elizabeth, IPRECON 2021, Betsy Biju, Ibrahim Ibrahim - Sess..., Konrad Schmitt, Aaron Sanju, Anagha, bakare kazeem, Jayakumar, Kenenna Igweh, prachi M Joshi, Raju M, Rohini, Shalvi.

32°C Partly sunny

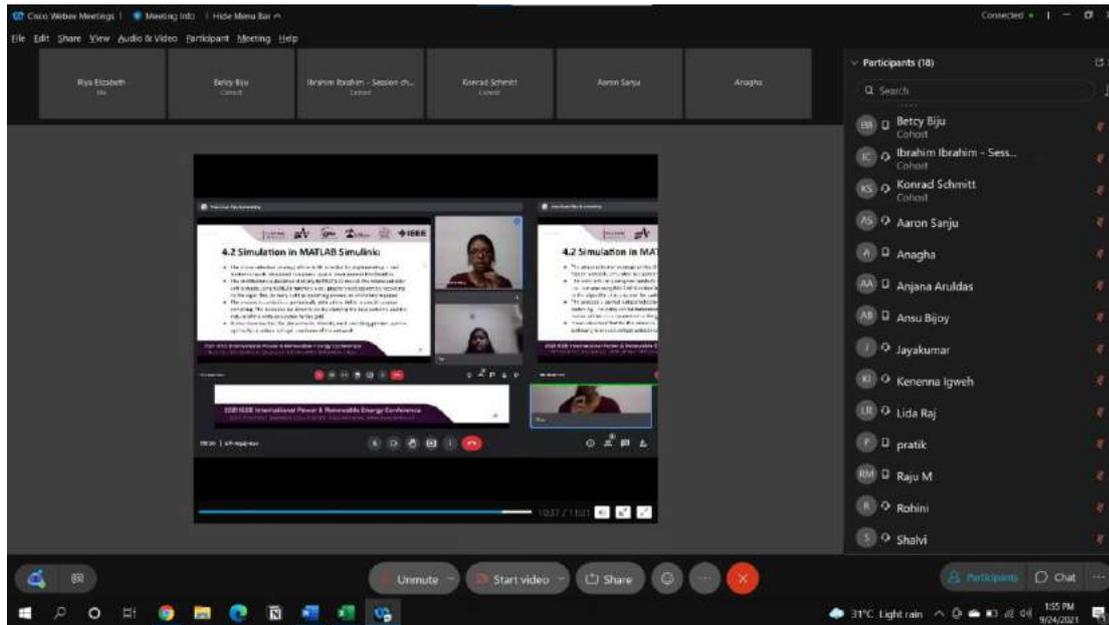
Paper 113

The screenshot shows a Zoom meeting interface. The main window displays a presentation slide titled "Hysteresis current control" with a waveform diagram. The slide includes the text: "The hysteresis current control is implemented to provide the gate pulses for the IGBTs. The IGBTs are driven by the hysteresis current control." Below the diagram, it says "Fig. 1. Hysteresis current control". The slide footer mentions "2021 IEEE International Power and Renewable Energy Conference (IPRECON)". The Zoom interface shows a top bar with participant names: Riya Elizabeth, Betsy Biju, Ibrahim Ibrahim - Sess..., Aaron Sanju, Konrad Schmitt, and Anagha. A right-hand panel lists 19 participants. The bottom bar shows controls for Unmute, Start video, and Share, along with system status (31°C, Light rain) and time (2:06 PM 8/24/2021).

Paper 49

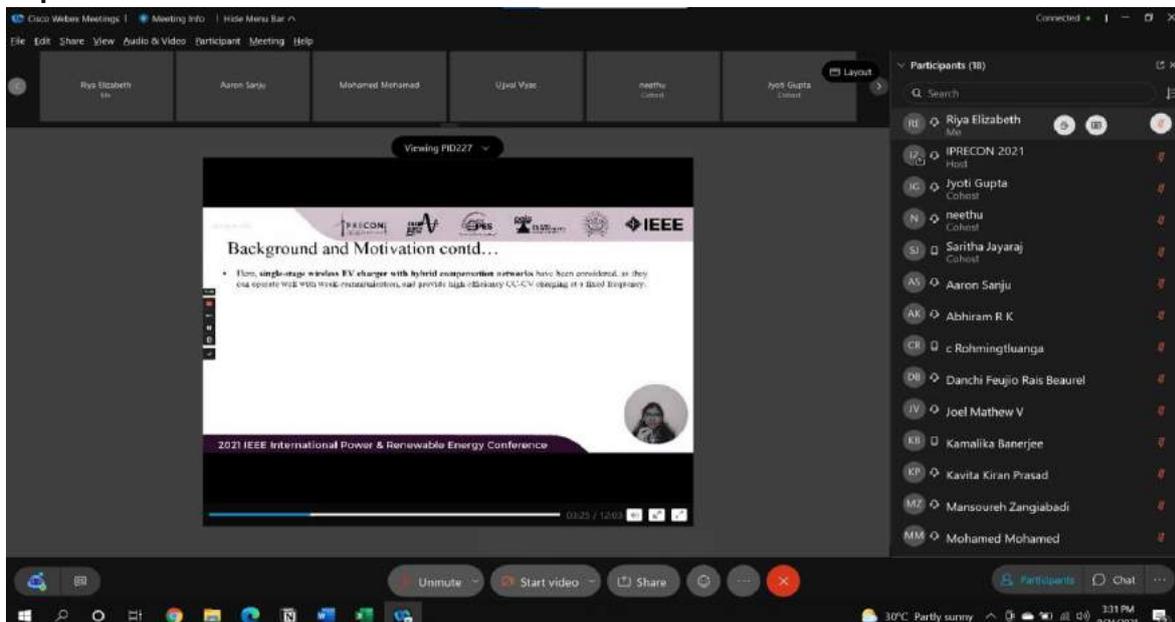
The screenshot shows a Zoom meeting interface. The main window displays a presentation slide titled "ANALYSED SYSTEM" with a block diagram of a grid-connected PV system. The diagram includes a PV array, MPPT, Boost Converter, IGBTs, and a Voltage Inverter. The slide footer mentions "2021 IEEE International Power and Renewable Energy Conference (IPRECON)". The Zoom interface shows a top bar with participant names: Riya Elizabeth, Betsy Biju, Aaron Sanju, Anagha, Anjana Analdas, and Ansu Bijoy. A right-hand panel lists 17 participants. The bottom bar shows controls for Unmute, Start video, and Share, along with system status (31°C, Light rain) and time (1:36 PM 8/24/2021).

Paper 58



The sixth track was on " **Energy Storage and Battery Charging Techniques**". The session chairs were Mrs. Jyoti Gupta, Ph.D. student, Ms. Saritha Jayaraj Assistant Professor, Department of EEE, Providence College of Engineering, and Mr. Ujjval B Vyas, research scholar. The track was concluded at 4.30 PM IST, appreciating all the authors and presenters for their hard work and research, and the session chairs were rendered a memento each for their cooperation and support.

Paper 227



Paper 131

Proposed Battery Control Design (Controllers Gains Calculation)

Choosing the normal operating point $\delta = 1000A$ (maximum discharging current of batteries $100A$, $V_{bat275V}$ and I_{bat100}), then the steady state values are derived to be $\delta = 0.8117$, $V_{bat} = 51.6V$, $V_{bat} = 110.4$, and $I_{bat} = 311.7 A$.

$$P_{11} = 2.246e - 11.7 + 2.230e - 9s^2 + 6.1771e + 381.2$$

$$P_{21} = -17s^2 + 2s - 11.7 + 3e - 10s^2 + 9880s + 4.08$$

$$P_{31} = 8.25e - 11.7 + 9.64e - 10s^2 + 0.2786e - 1.269$$

$$P_{41} = 8e - 12s^2 + 5e - 11.7 + 2s - 10s^2 + 0.1031e + 0.028$$

$$P_{51} = -2.471e - 90s^2 - 0.2137e + 8.8604$$

$$P_{61} = 2.421e - 85s + 0.2137$$

$$P_{71} = 0.1826$$

$$P_{81} = 1.156e - 3s + 1$$

Table 8: System under study parameters value

Parameter	Value
V_{bat}	110.4
V_{bat}	51.6
V_{bat}	30.48
V_{bat}	7.92
V_{bat}	1.98
V_{bat}	24.96
V_{bat}	184.95
V_{bat}	4.62
V_{bat}	3.036

Table 9: Desired specification of controllers and corresponding gain value.

Controller	η	ξ	ω_n
Controlled	0.01	0.7	100
Feedback	0.01	0.7	100
Flux control	0.01	0.7	100
K_p	8.615		
K_i	115.6		

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 (IAE) STUDENT TRASHI COLLEGE OF ENGINEERING KAPPAKANGARALEY

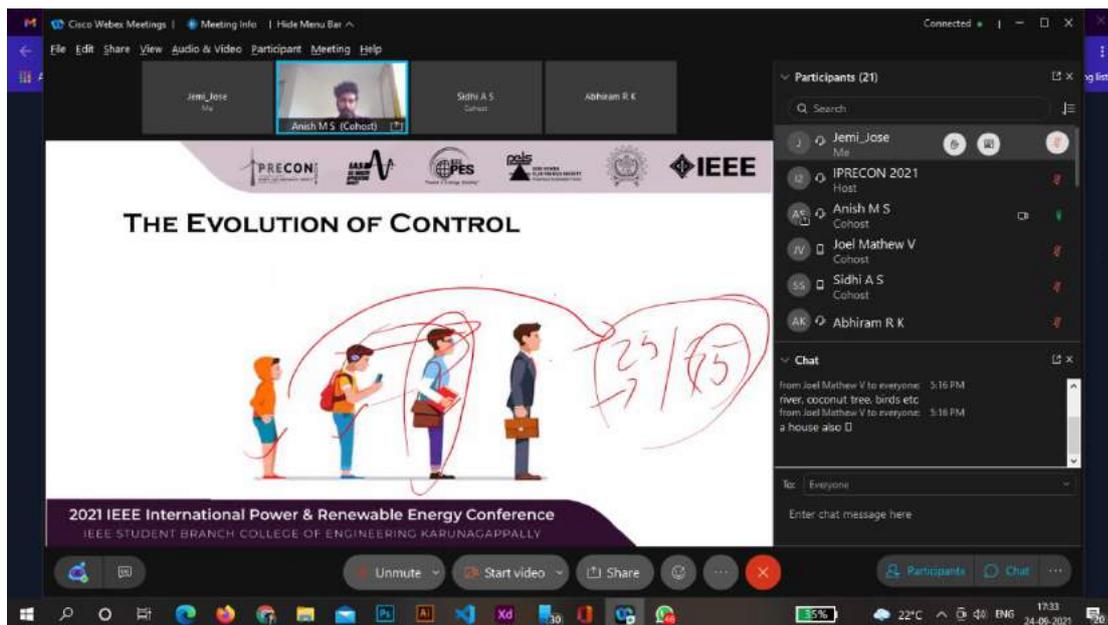
Paper 241

Microgrid Integrated Charging Infrastructure

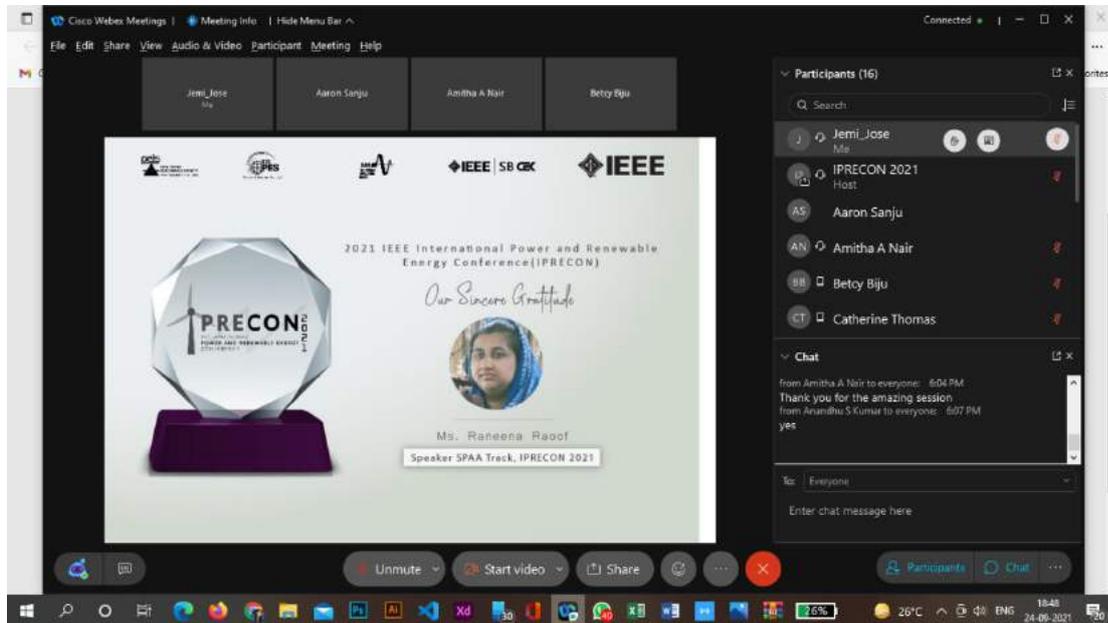
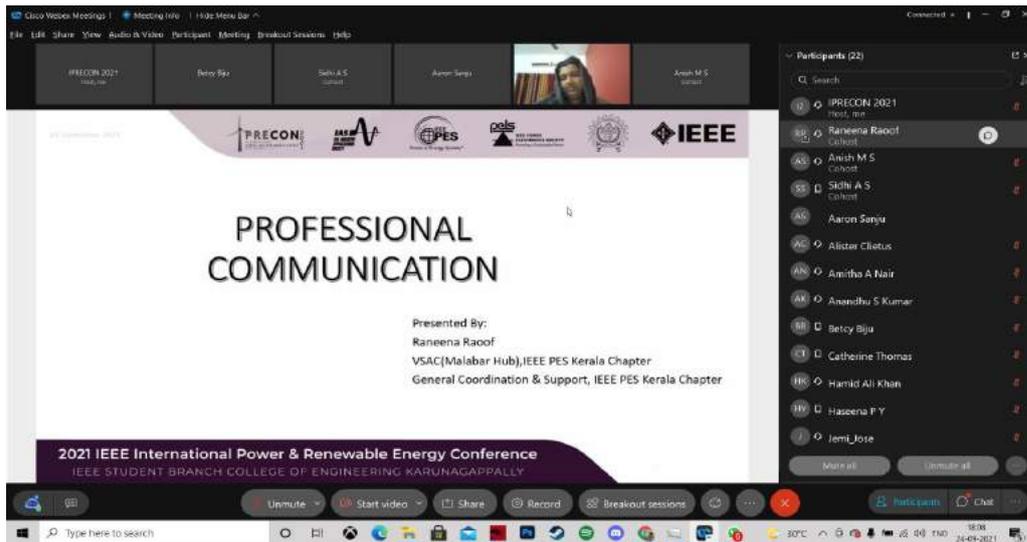
Fig. 1: Micro-Grid integrated charging infrastructure

2021 IEEE International Power & Renewable Energy Conference
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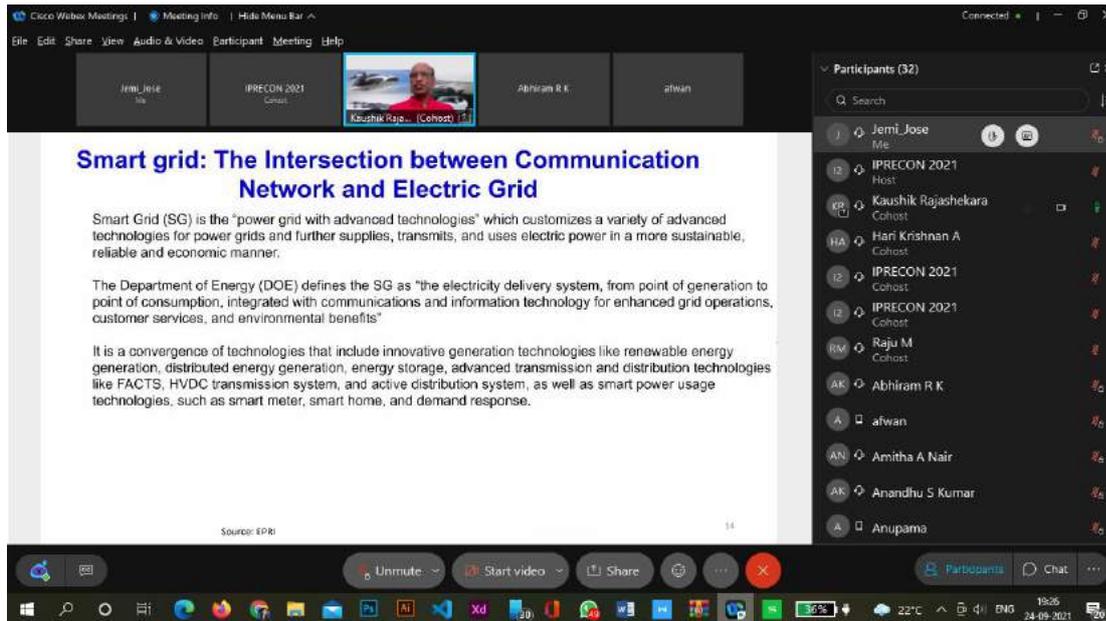
After finishing off all the tracks of the day, the event continued with our first **Student Professional Awareness Track** which was primed on “The Bridge Between Student and Professional Life” by Anish M S, Public Relations Coordinator, IEEE Germany Section Coordinator, New Initiatives & Projects Subcommittee, IEEE PES YP. The event started sharp at 05:00 pm (IST) and continued till 06:15 pm (IST). One of Life’s most confusing moments comes when a student has to leap from school to work. Crossing the bridge from your education life to your work life is a pivotal juncture that sets the stage for the rest of your life He pointed out some enlightening entities in the field which were appreciated by the attendees and was offered a memento as a token of appreciation for his incredible efforts and support for the event.



The second session of **Student Professional Awareness Track** was prepared on “Professional Communication” by Raneena Raof, New Initiatives & Project Subcommittee Member, IEEE PES YP, Content Team Coordinator, IEEE PES YP Kerala, and Vice Student Activities Coordinator, IEEE PES Kerala Chapter. The event started sharp at 06:15 pm (IST) and continued till 07:15 pm (IST). Professional communication is a specialty sub-field of communication that pays close attention to the theories and practice of communication within professional contexts. They encompass written, oral, visual, and digital communication within a workplace context. She specified out some intellectual entities in the field which were appreciated by the attendees and was offered a memento as a token of appreciation for her incredible efforts and support for the event.



Our first **Keynote Session** on "Convergence of Enabling Technologies for Smart Grid" by "Dr. Kaushik Rajashekara", Distinguished Professor of Engineering, University of Houston. The event started sharp at 07:15 pm (IST) and continued till 08:30 pm (IST). He addressed the smart grid concept which is transforming utility operations at an unprecedented rate and is probably the most significant consideration in bringing IT into the operational environment. She specified out some mind-broadening entities in the field which were appreciated by the attendees and was offered a memento as a token of appreciation for her incredible efforts and support for the event.



IPRECON 2021 was successfully able to exceed everyone’s expectations. Everyone Involved in the conference had quite an exhilarating time as were evident by their reviews. It was indeed the beginning of the CLUB OF 6 Conferences in India and IEEE SB CEK Takes immense pride to be the one to come up with such an endeavour. IPRECON 2020 Enlightened not only the youth, but even the professionals into a path of diverse technical Advancements and was indeed a full-fledged conference.

Day 2

The second day of IPRECON 2021 went well on 25th September 2021, one of the most remarkable paper presentations, special sessions, keynote addresses and an astounding humanitarian track orchestrated for the attendees. It started with 3 parallel tracks through webex, from 9.30 -12.30PM IST , both the authors as well as the presenters came up with works and presented brilliantly and the coordination and management of the organizers elevated the quality of the conference to a higher level worth experiencing.

Track 7 was **Power Electronic Converters & Control Systems**. Session Chairs for the track were Mrs. Jyothi Gupta, PhD Scholar, SVNIT and Mrs. S Vimala Gayathri, Research Scholar , VIT University, Chennai. Track 8 was on **Electric machines & devices and Power quality issues**, Session chairs were Mr. Antony Peter, PhD Scholar, APJ KTU and Ms. Ruby Vincy, PhD Scholar VIT University, Chennai. This track contained seven papers , under the paper titles.

Paper 196

Viewing T196

Introduction

```

    graph LR
      A[BI-DIRECTIONAL DC-DC CONVERTER] <--> B[BI-DIRECTIONAL INVERTER]
      B <--> C[MOTOR]
  
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Fig. 1: Basic block diagram of electrical vehicle (EV)

2021 IEEE International Power & Renewable Energy Conference
IEEE STUDENT BRANCH COLLEGE OF ENGINEERING KARUNAGAPALLY

Participants (11): Jemi Jose, IPRECON 2021, jyoti gupta, Vimala Gayathri S, Amritha Menon, Doğan Çelik, Enock, hanumanthu ravi teja, Prachi Mafidar Joshi, Sayande Ghosh, SOURABH JAIN.

Paper 213

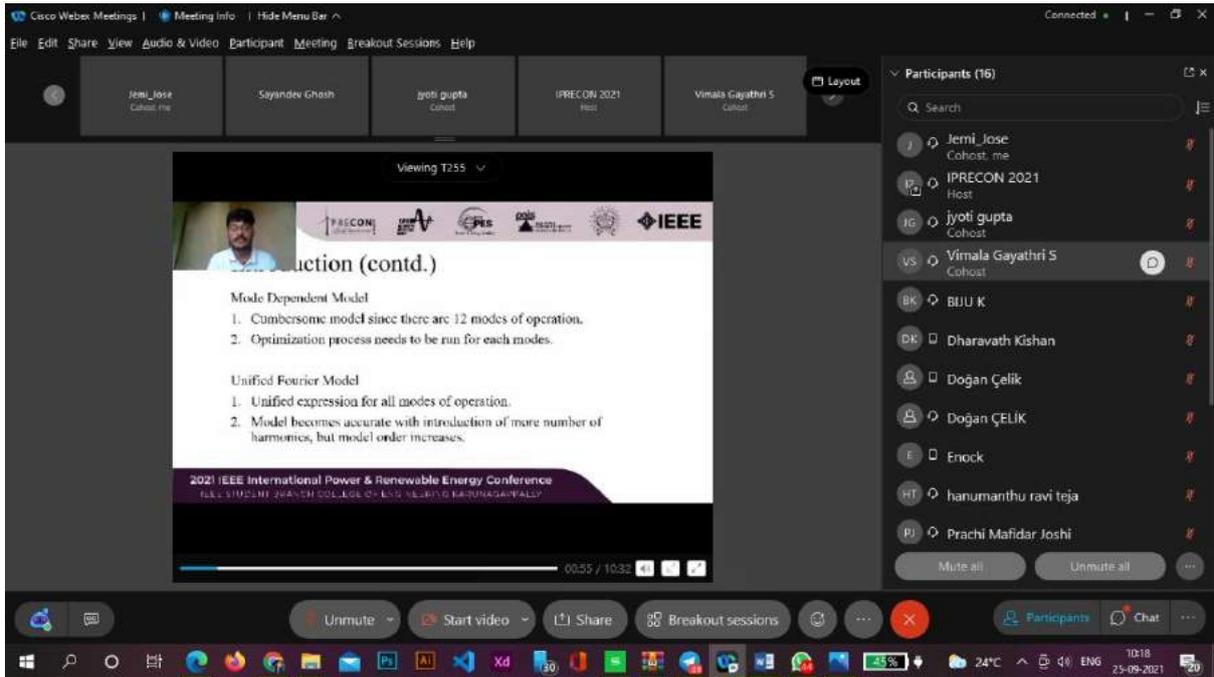
Z-source Inverter

- It overcomes the disadvantage of traditional inverters
 - Limited obtainable output voltage range
 - Vulnerable to EMI noise
 - Combined system has lower reliability
- Works as a buck-boost inverter
- Offers novel power conversion concept.
- Both switches from the same leg trigger at the same time do not cause any failure.

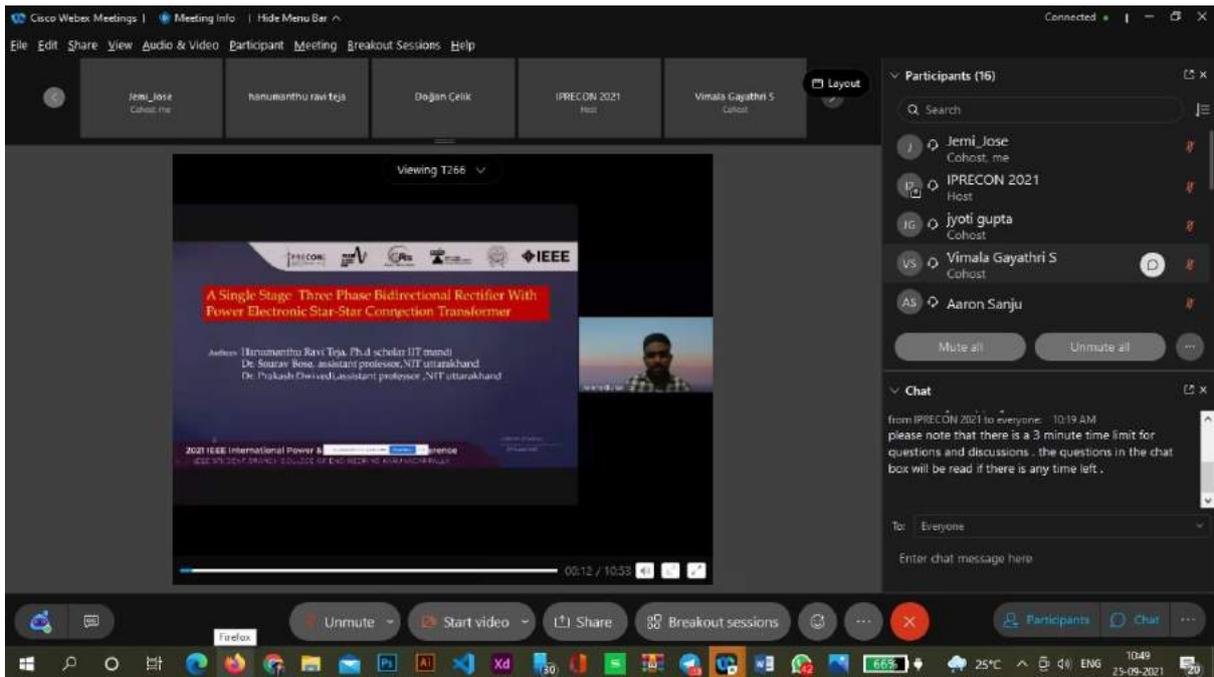
2021 IEEE International Power & Renewable Energy Conference
IEEE STUDENT BRANCH COLLEGE OF ENGINEERING KARUNAGAPALLY

Participants (15): Jemi Jose, IPRECON 2021, jyoti gupta, Vimala Gayathri S, Amritha Menon, BUJU K, Doğan Çelik, Doğan ÇELIK, Enock, hanumanthu ravi teja, Prachi Mafidar Joshi, Sabeena K.

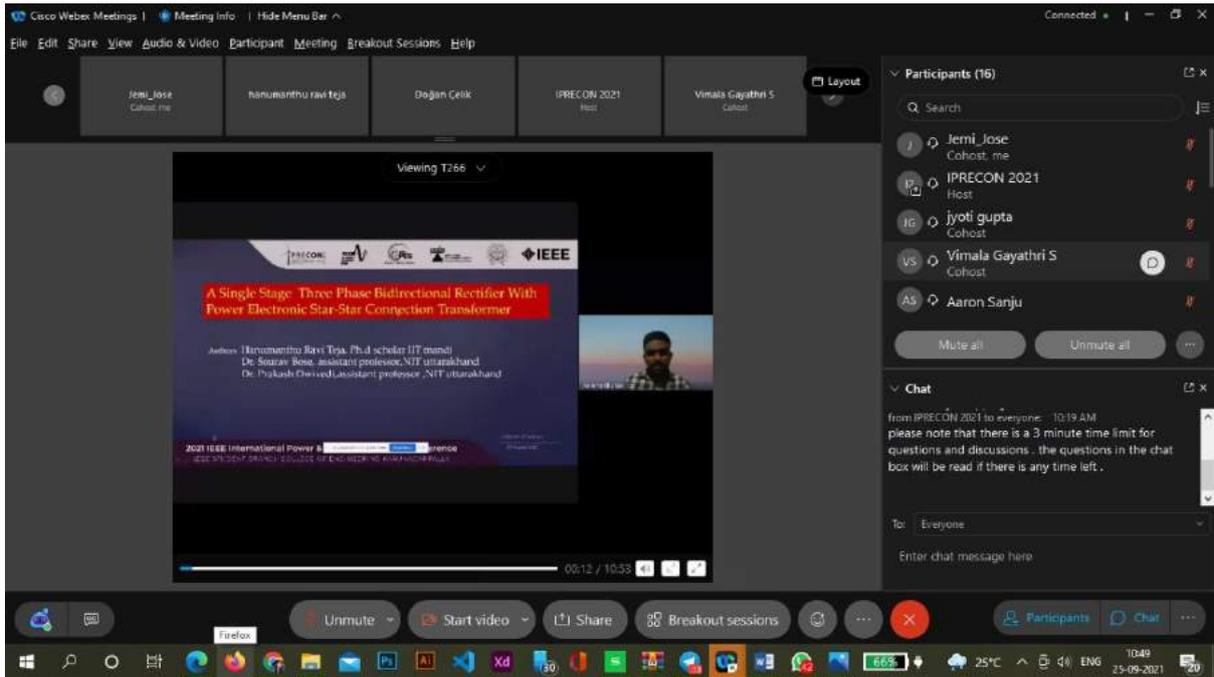
Paper 255



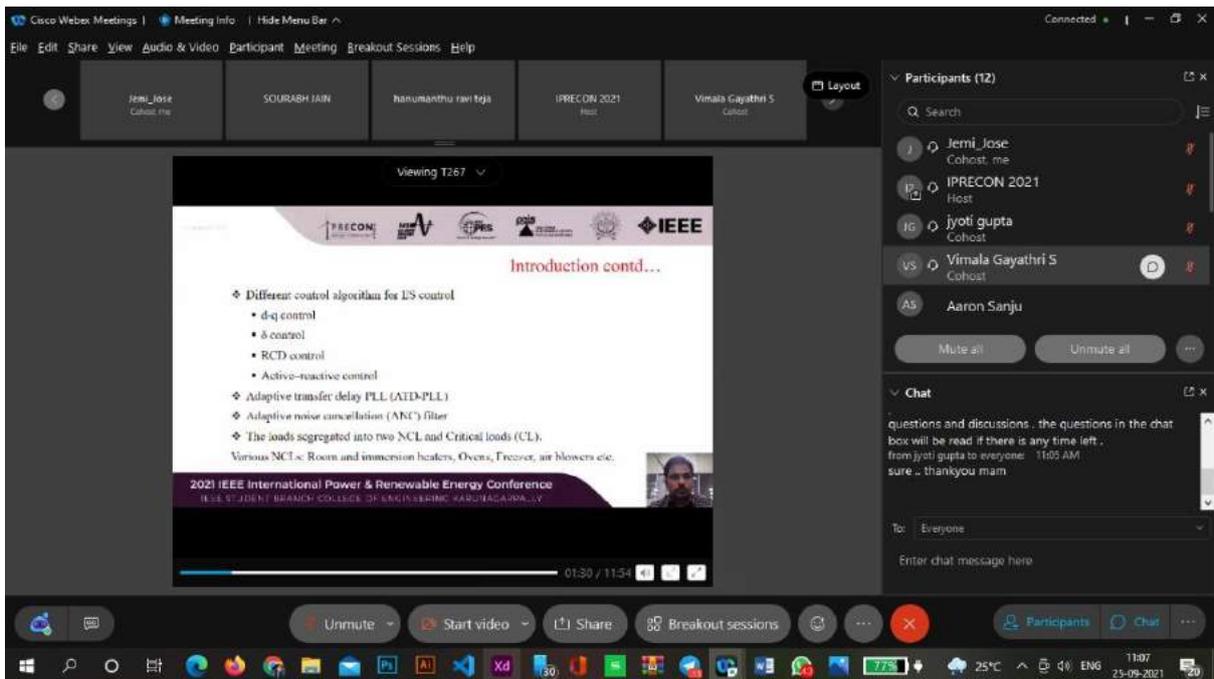
Paper 262



Paper 266



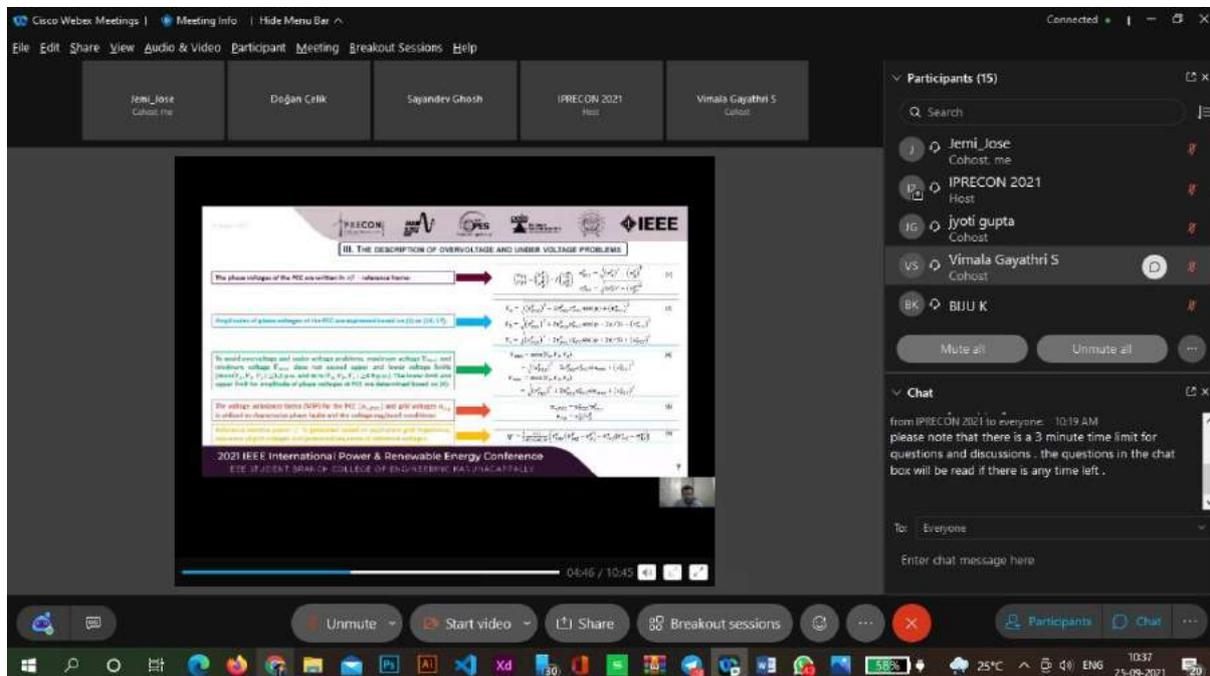
Paper 267



We concluded this track by presenting a token of love to our session chairs.

Track 8 was on **Electric machines & devices and Power quality issues**, Session chairs were Mr. Antony Peter, PhD Scholar, APJ KTU and Ms. Ruby Vincy, PhD Scholar VIT University, Chennai. This track contained seven papers, under the paper titles

Paper 112



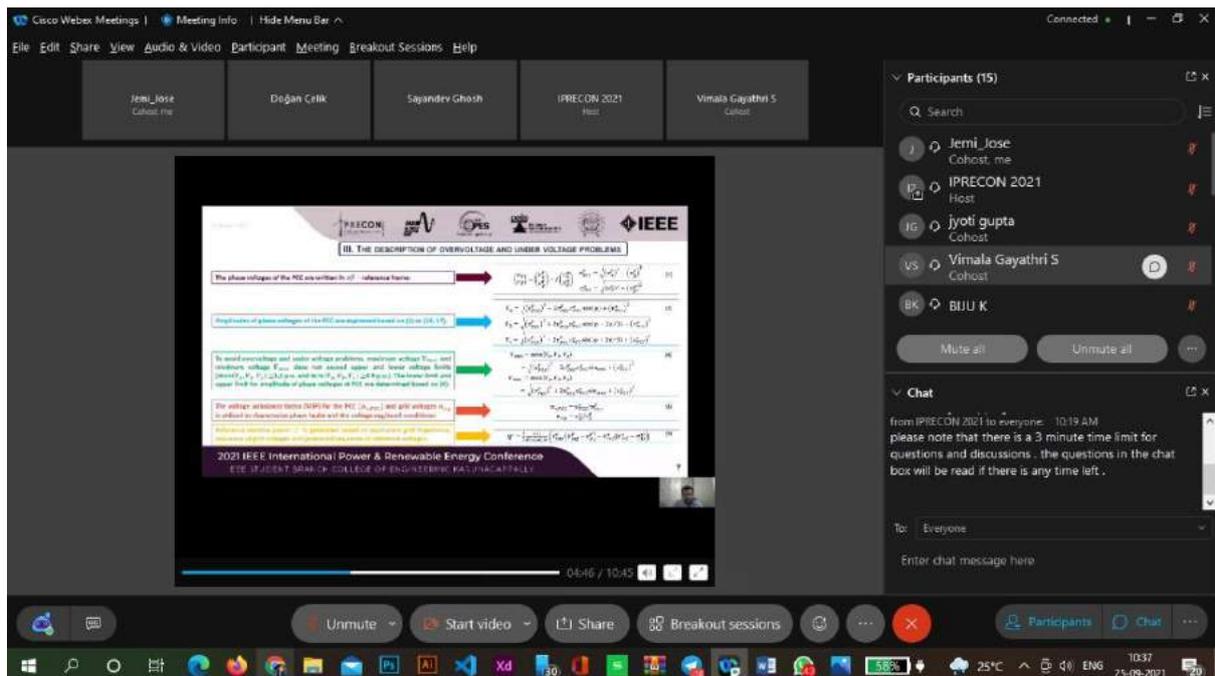
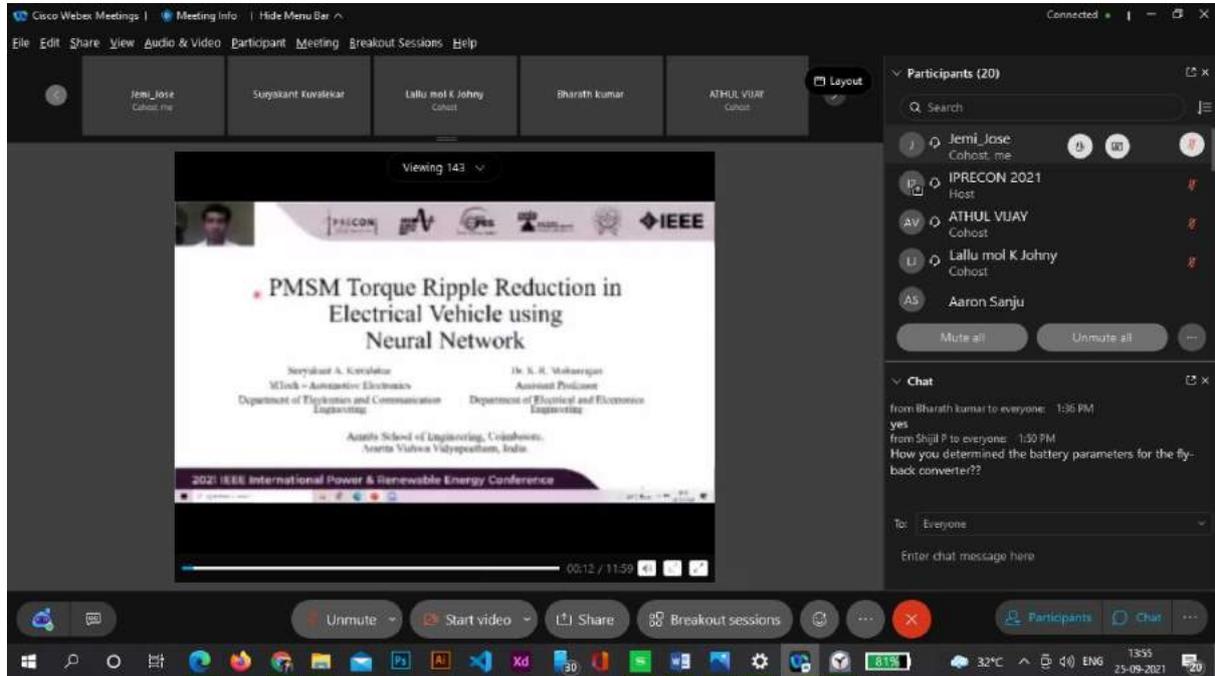
Several more papers were presented in this session.

Track 9 was on **Renewable Energy Resources**, Session Chairs were Mr. Raju Manuel, PhD Scholar, Korpagam University, Coimbatore, Ms Soniya Vijayakumar PhD Scholar, German Research Center of AI and Mr. Robin Anto, PhD Scholar, Dept of HRED. With attendees including presenters, students, research scholars and professionals, the session turned interactive with post-presentation discussions. There were several presentations from each tracks, which all were very informative, interesting and highly vibrant with the interaction of presenters, students, research scholars and professionals.

Several paper ids 123, 124, 132, 138, 149, 150, 151, 155 presented after that. All the presenters were able to provide a clear and concise presentation on their respective work.

The 3 parallel tracks were concluded by giving a token of appreciation from SB to all the respective session chairs for their efforts and support. And by that first session of day 2 of IPRECON 2021 was concluded.

The second session Was having Tracks 10, 11 and 12 parallelly from 1:30 PM – 4:30 PM IST. Track 10 was on **Electric Vehicles**, the session Chairs being Mr. Lallu Mol K Johny, PhD Scholar, APJ AKTU and Mr. Athul Vijay, PhD Scholar, NIT Surat. The paper title of this track is as follows.





The screenshot shows a Cisco Webex meeting interface. The main content is a presentation slide titled "Electric Powertrain Performance, Mileage And Drive Cycle Analyzer For Electric 2 & 3-wheelers". The slide includes the following text:

- Paper ID: 183
- Author: Praveen, Baski Mohd Muneer (Department of Electrical Engineering, COEP)
- Co-Author: Dr. Muneer Mohd. (Department of Electrical Engineering, COEP)
- Dr. M. Ravi Ramesh (MBA, India Automation Pvt. Ltd.)
- 2021 IEEE International Power & Renewable Energy Conference
- IEEE STUDENT BRANCH COLLEGE OF ENGINEERING, KARNATAKA PETAL

The meeting interface shows 13 participants in the sidebar. The bottom of the screen displays the Windows taskbar with various application icons and system tray information including the date 25-09-2021 and time 14:24.

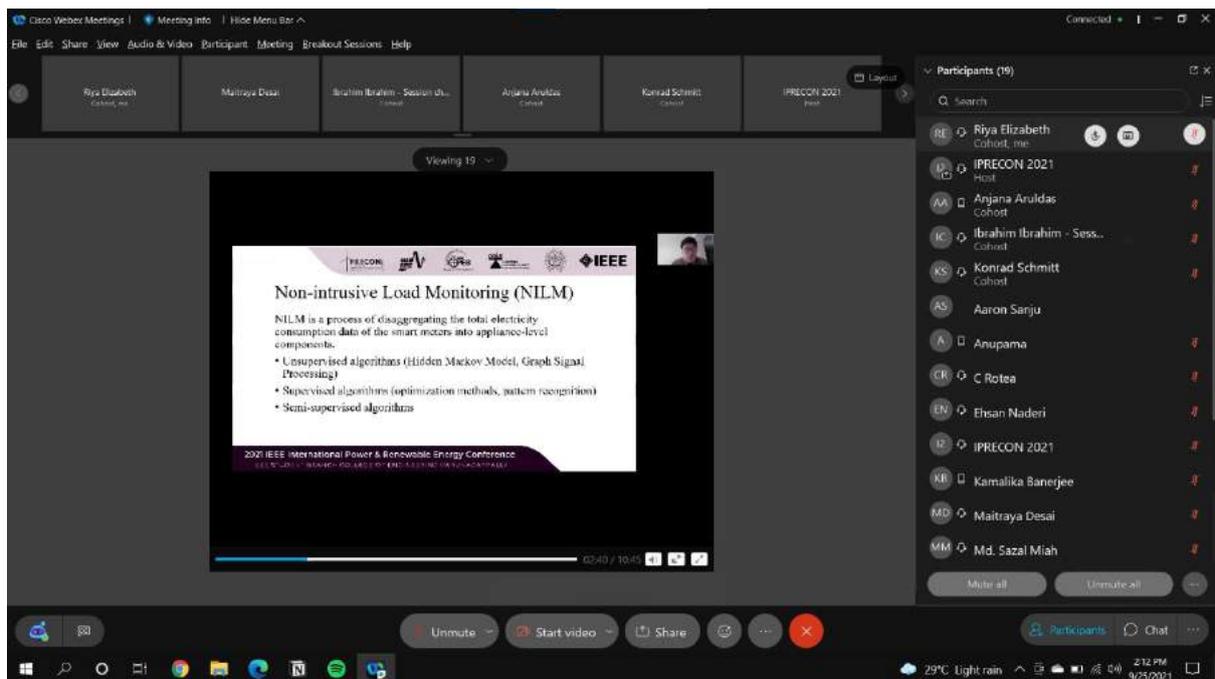
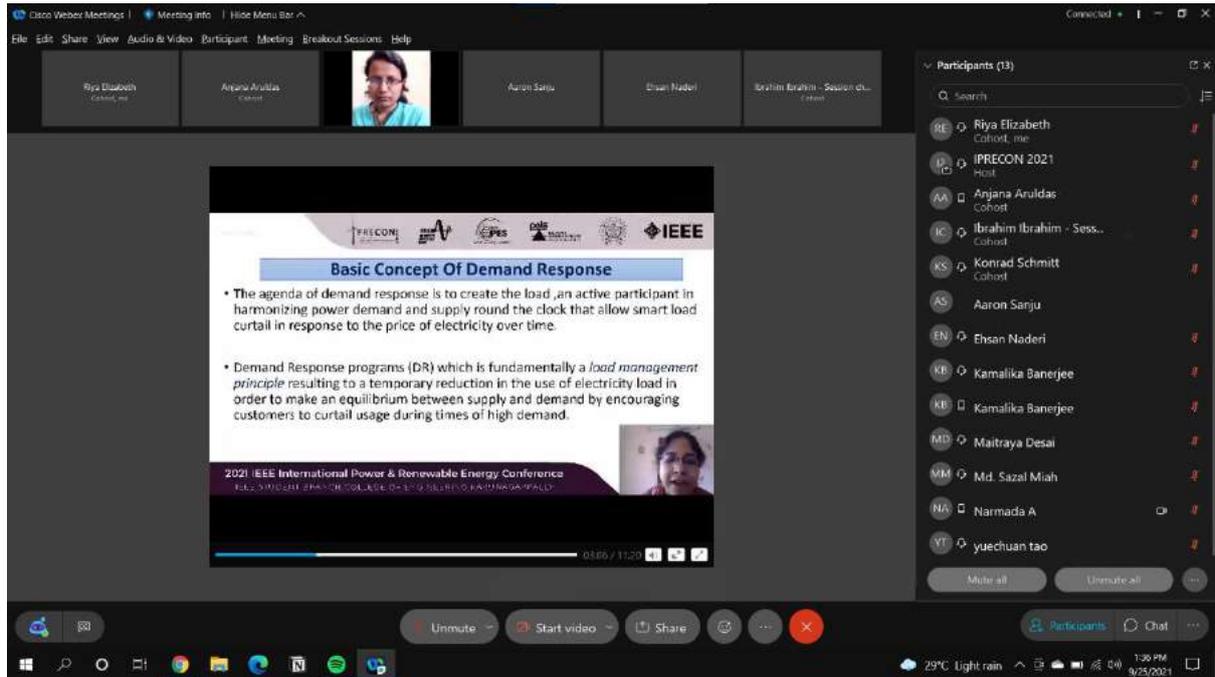
The screenshot shows a Cisco Webex meeting interface. The main content is a presentation slide titled "Motivation" with a list of four points:

1. In urban conditions, more than 23% of vehicle kinetic energy can be recycled as per the research details and survey. Most of the kinetic energy is getting wasted as heat to the atmosphere due lack of effective and efficient braking control strategies.
2. Studying and understanding the working and outcome of one such control strategy and an algorithm is carried out and a detailed explanation is provided.
3. Research indicates that almost 50% of energy in a pure electric vehicle driving system is discarded into the atmosphere in the form of heat by a conventional braking system during deceleration. Even in suburban circumstances, the quantity of discarded energy is as high as 24%.
4. Therefore, to solve the shortage of fuel as well as that of the endurance mileage, it is crucial to identify methods for enhancing the regenerative braking technology of the pure electric vehicle.

The meeting interface shows 9 participants in the sidebar. The bottom of the screen displays the Windows taskbar with various application icons and system tray information including the date 25-09-2021 and time 14:37.



Track 11 was on **Micro Grid and Smart Grid**, the session chairs were Mr. Konrad, PhD Scholar, Texas University and Mr. Ibrahim A Ibrahim, PhD Scholar, Macquarie university, Australia



Cisco Webex Meetings | Meeting Info | Hide Menu Bar

File Edit Share View Audio & Video Participant Meeting Breakout Sessions Help

Riya Elizabeth (Host) | IPRECON 2021 (Host) | Yudhan Fatmahaningrum (Participant) | Anjana Aruldas (Participant) | Konrad Schmitt (Participant) | Kamalika Banerjee (Participant)

Methodology

- This research uses an entire year's accumulation of energy data from a large hypermarket via smart meters that record temperature and energy consumption data.
- Ordinal binning is then performed on this dataset to create three separate datasets of consisting of 3, 5 and 7 classes of energy each.

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05:02 / 11:51

Unmute Start video Share

29°C Light rain 1:07 PM 9/25/2021

Participants (19)

- Riya Elizabeth (Host)
- IPRECON 2021 (Host)
- Anjana Aruldas (Participant)
- Ibrahim Ibrahim - Sess... (Participant)
- Konrad Schmitt (Participant)
- Aaron Sanju (Participant)
- Anupama (Participant)

Chat

from Anjana Aruldas to everyone: 1:00 PM
sorry for the delay.

from Ibrahim Ibrahim to everyone: 1:50 PM
That is alright. Such things happen.

To: Everyone

Enter chat message here

Cisco Webex Meetings | Meeting Info | Hide Menu Bar

File Edit Share View Audio & Video Participant Meeting Breakout Sessions Help

Riya Elizabeth (Host) | Ibrahim Ibrahim - Session Dis... (Participant) | Konrad Schmitt (Participant) | Anjana Aruldas (Participant) | Yudhan Fatmahaningrum (Participant) | Mubaya Doss (Participant)

Developed Microgrid

Diagram of the developed MEG

$$P_{DG} = \frac{1}{2} \rho A v^3 C_p C_{te}$$

$$P_{PV} = A_p \times I_p \times V_p$$

2021 IEEE International Power & Renewable Energy Conference
IEEE STUDENT BRANCH COLLEGE OF ENGINEERING ANNAMALAI

01:35 / 10:32

Unmute Start video Share

29°C Cloudy 2:24 PM 9/25/2021

Participants (19)

- Konrad Schmitt (Participant)
- Abhiram R K (Participant)
- Anupama (Participant)
- C Roitea (Participant)
- Ehsan Naderi (Participant)
- IPRECON 2021 (Participant)
- Jayakumar (Participant)
- Kamalika Banerjee (Participant)
- Maitraya Desai (Participant)
- Mid. Sazal Miah (Participant)
- Narmada A (Participant)
- Pavitra G Dummawad (Participant)
- Prachi Mafidar Joshi (Participant)

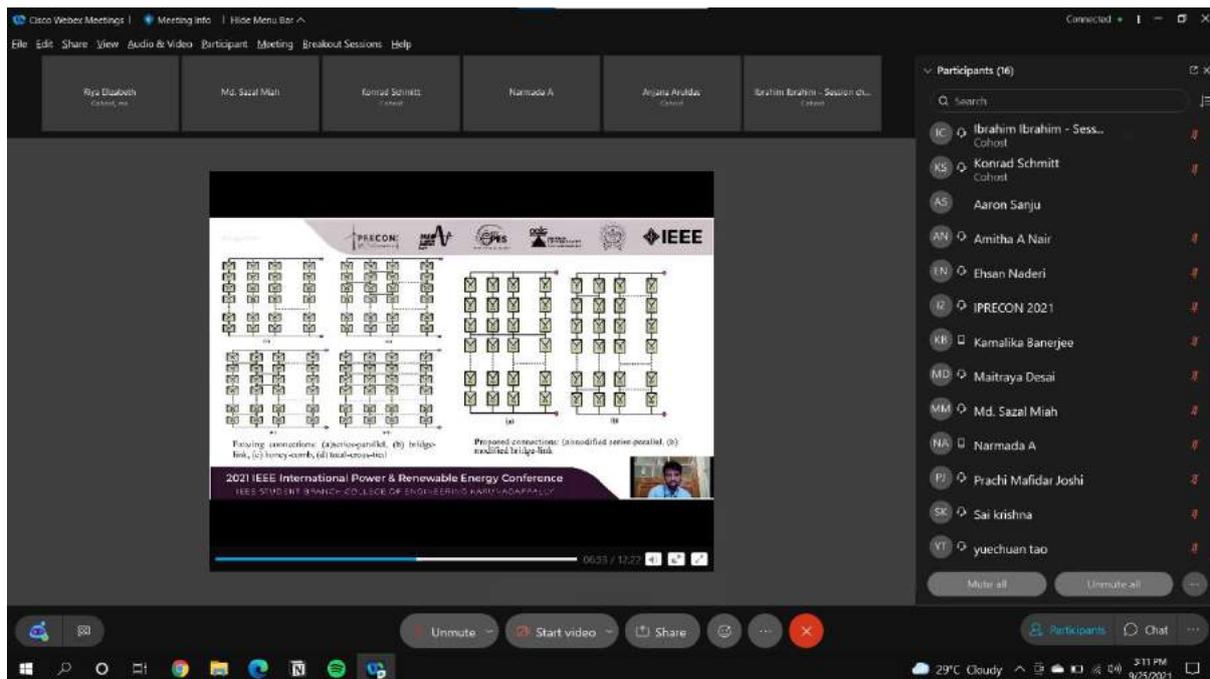
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Smart Grid

- Advanced automatic control and communications techniques
- Integrates innovative tools and technologies from generation, transmission and distribution

Fig. 1: Smart Grid

2021 IEEE International Power & Renewable Energy Conference
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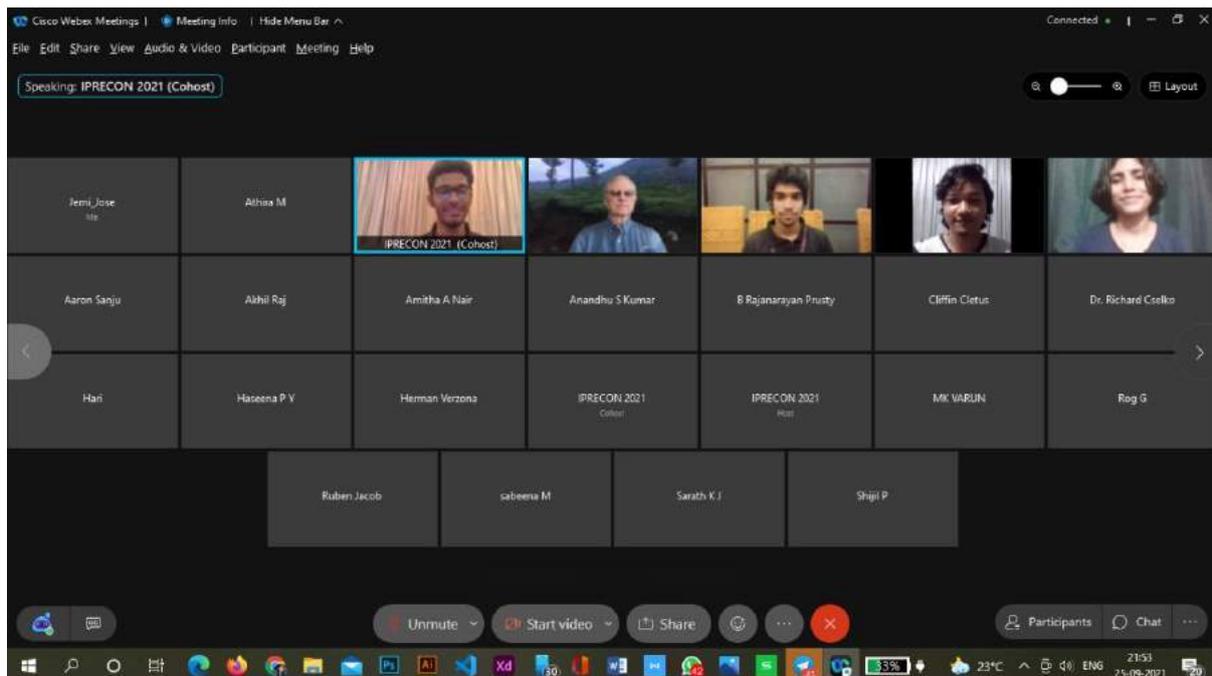


Track 12 was on **Artificial Intelligence Techniques & Deep Learning**, the session chairs for the track were Ms. Amina Beevi, PhD Scholar APJ AKTU and Mr. Chempak Kumar A, PhD Scholar, University of Kerala. The session concluded by thanking and appreciating all the authors and presenters for their hard work and research. It was a very informative session and all the attendees were very pleased with what they have learned and experienced. The session chairs were rendered a memento each for their support and cooperation. The time management and session coordination of the team were also well commendable. The paper title and paper id are as follows:

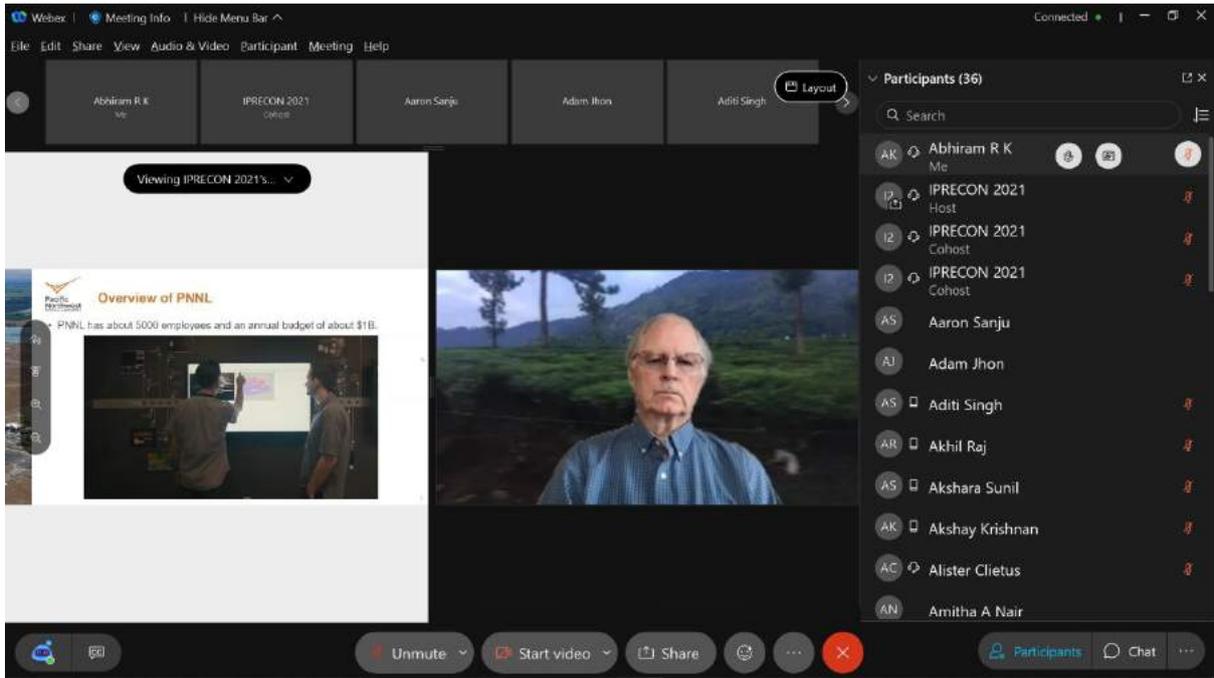
The afternoon session of the second day of IPRECON 2021 was eventful with a special session, key note session and an industrial visit. A special session on **The Potential of Electricity Based Fuels for Low Emission Personal Cars** by Dr. Peter Magyar, Past IEEE IAS CMD chair from 5:30 PM – 6:30 PM IST. It addressed the rising potential and market of renewable and electricity-based fuels in transportation. It was a very interesting session attendees ask their queries and had discussions on their opinions. It was followed by the Key note address by Mr Brad Lehman, Prof. Department of Electrical & Computer Engineering, Northeastern University, Boston on **The Future Influence of Artificial Intelligence & Renewable Energy** from 7:30 PM – 8:30 PM IST. The session focused on the relevance of artificial intelligence & renewable energy in the current as well as future world, sharing some of his experience and developments in the fields. The session was very interactive as well as informative, the attendees were so eager to know more about the field and were asked to share their queries on the topic.

The concluding session of the second day of IPRECON 2021 was a **Virtual Laboratory Visit to PNNL** by Mr. Richard Kouzes, Laboratory Fellow at the Department of Energy's (DOE's) Pacific Northwest National Laboratory (PNNL) working in the areas of neutrino science, homeland security, non-proliferation, and computational applications accompanied entirely.

It was such a great experience to visit a leading centre for scientific discovery in chemistry, data analytics and earth science, and technological innovation in sustainable energy and national security, scheduled from 9:00 PM - 10:00 PM IST. It was a very amazing session as we were able to visit several new gadgets and devices as well as to witness some incredible possibilities of technical advancements for the future.

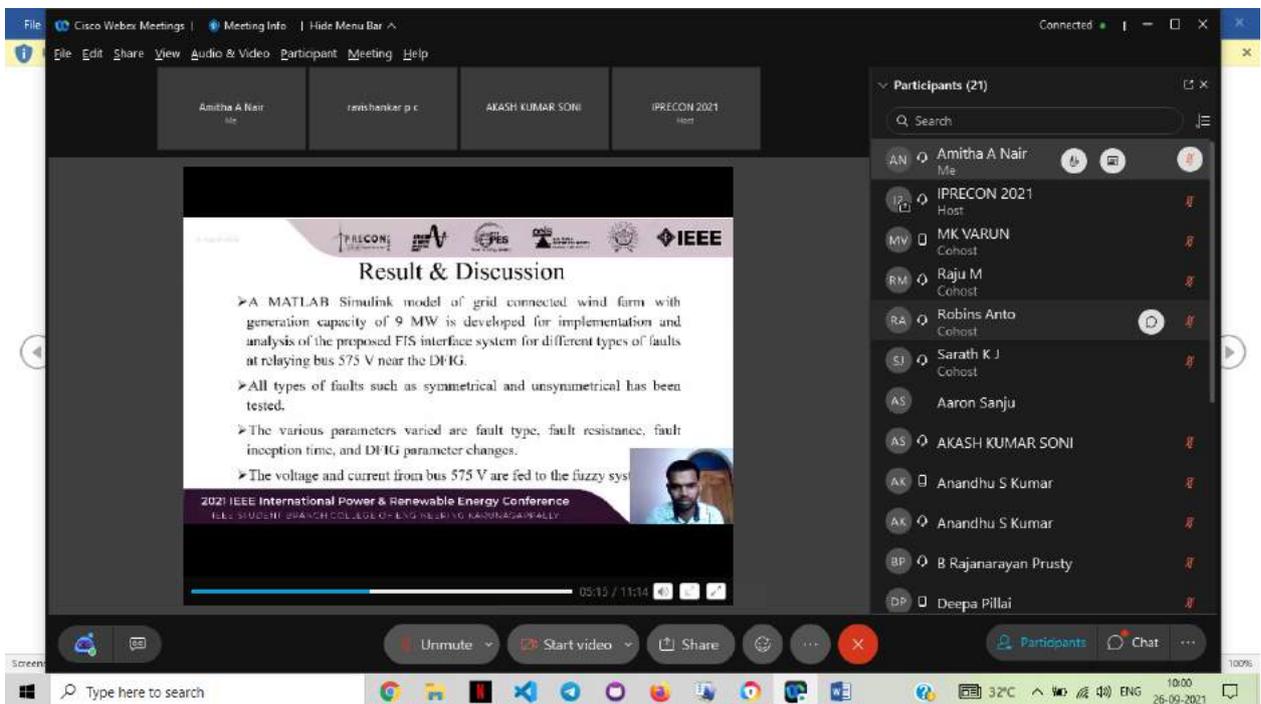


The second day thus turned eventful as it witnessed some of the remarkable paper presentations, special sessions, keynote address and an astounding industrial visit. The coordination and management of the organizers elevated the quality of the conference to a higher level.

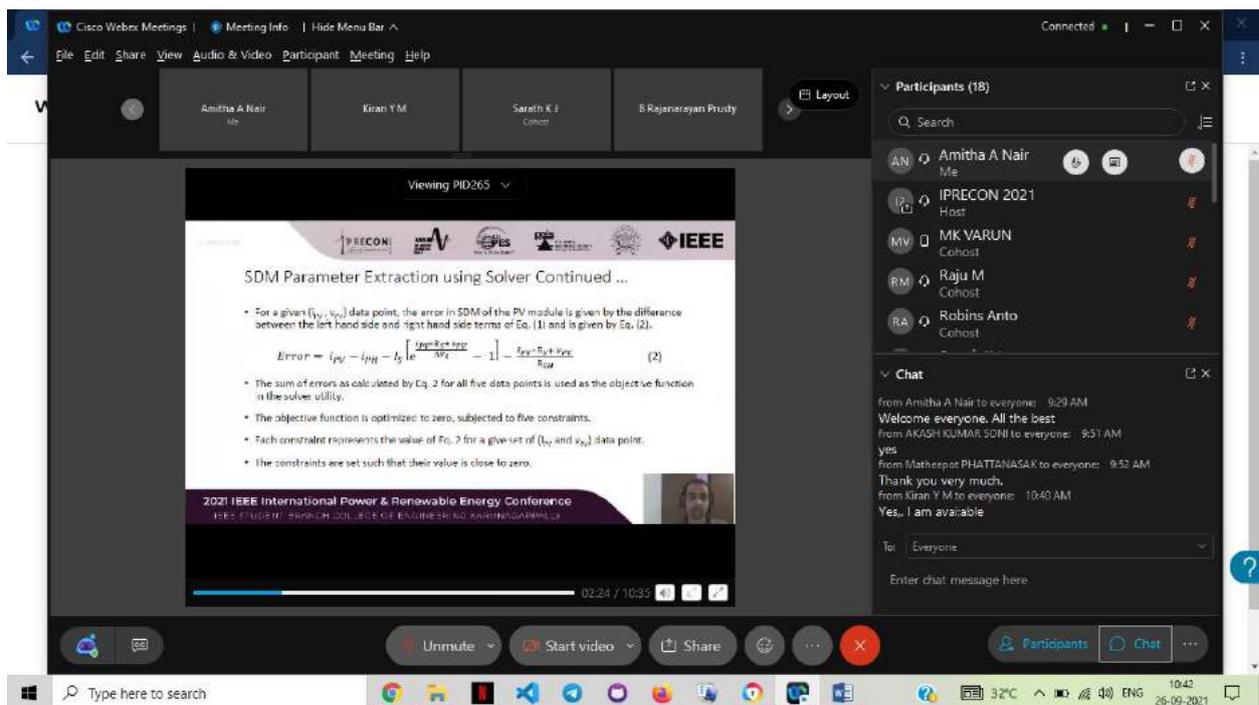


Day 3

IEEE International Power and Renewable Energy Conference organized by IEEE Student Branch College of Engineering Karunagappally in association with IEEE Industry Applications Society came to end on 26th September after three days of incessant Activities and prolific deliberations of interesting as well as informative ideas. Due to the pandemic the virtual platform has been opted for the conference.

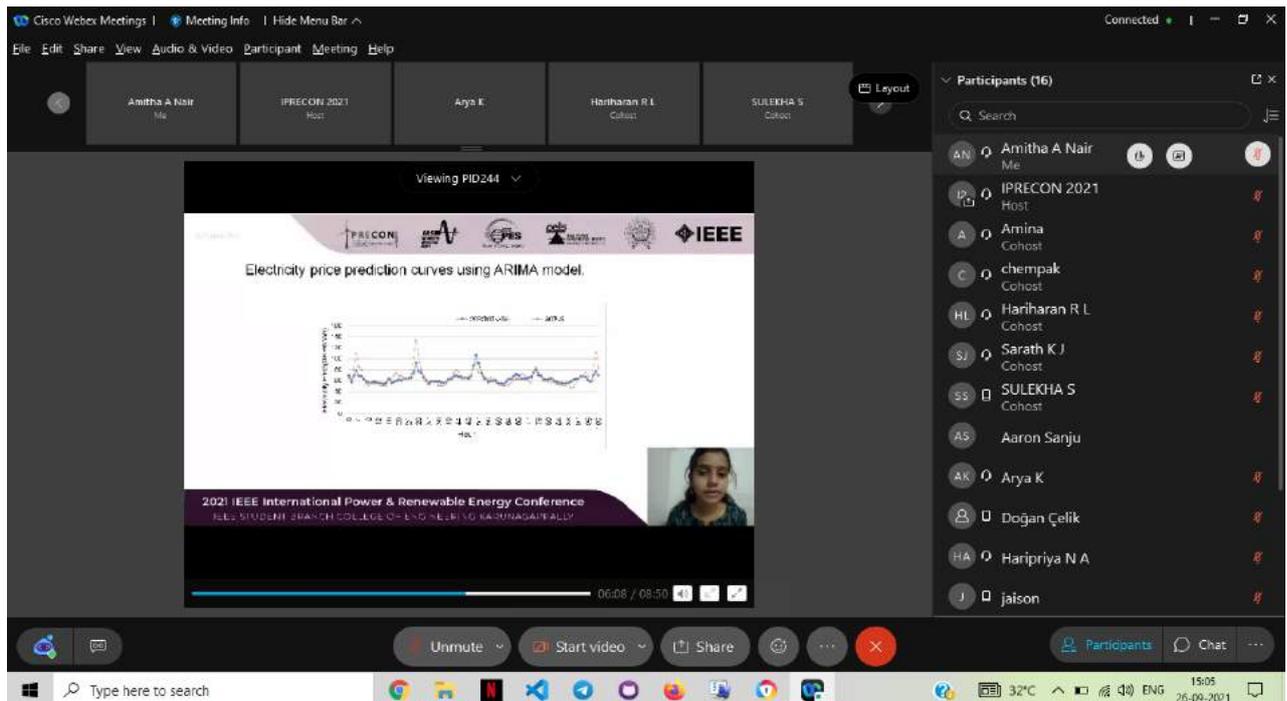
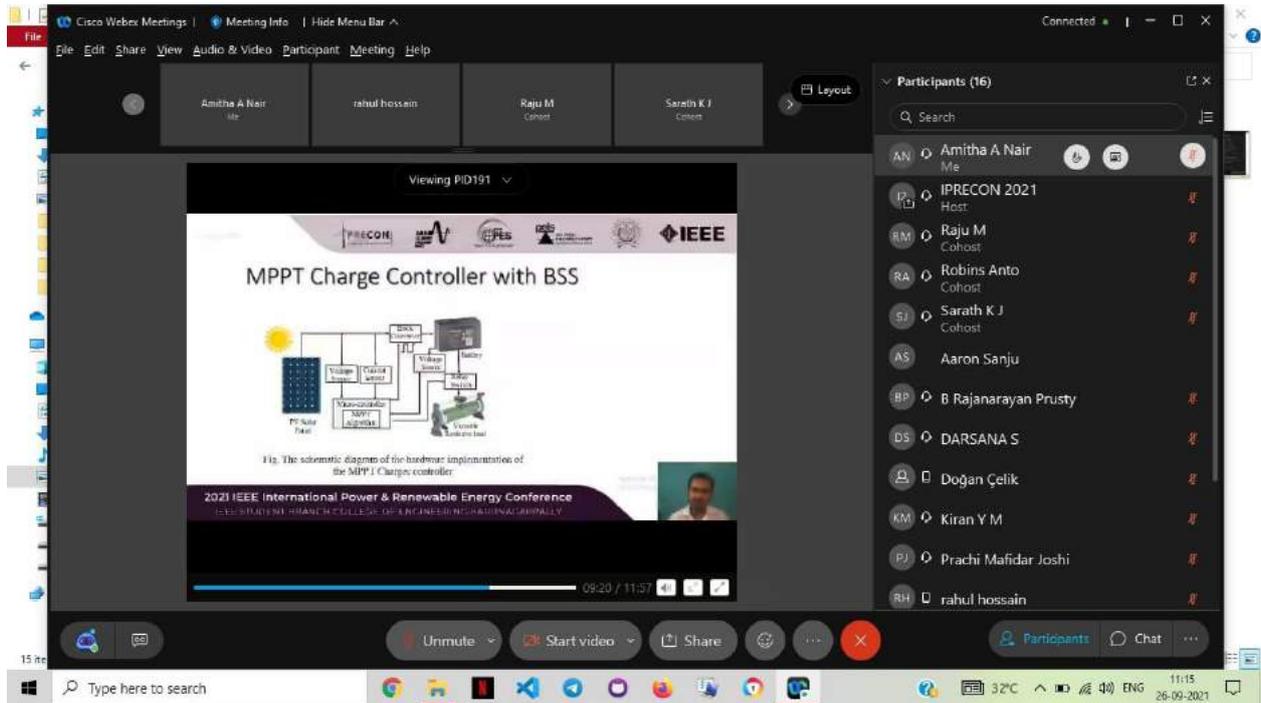


The final day of IPRECON 2021 dated 26th September Sunday consisted of 6 Tracks, Tracks 13 through 18, a Humanitarian Track and the Closing Ceremony. The first session consisted of Tracks 13 through 15 running parallelly from 9: 30 AM to 12: 30 PM IST. Track 13 was on the Topic Renewable Energy Resources consisting of 7 paper presentations. The Session Chairs were Mr. Raju Manuel, a PhD Scholar from the Karpagam Academy of Higher Education, Coimbatore and Mr. Robins Anto, a Research Scholar at the Department of Hydro and Renewable Energy at IIE Roorkee. Track 14 was on the topic Electric Vehicles consisting of 6 paper presentations. The Session Chair were Mrs. Lallumol K Johny a Research Scholar affiliated with APJ Abdul Kalam University, Kerala and Mrs. Kripalakshmi Thiagarjan , Research Scholar from Vellore Institute of Technology, Chennai.



Track 15 was on the Topic Microgrid, Smartgrid and Power Quality Issues consisting of 8 paper presentations. The Session Chairs were Mr. Konrad Erich Kork Schmitt, a PDH Scholar from the Texas Technical University and a Research Assistant at GLEAMM and Mr. Ibrahim A Ibrahim, a PHD candidate with the Macquarie University, Sydney, Australia and a Visiting PhD Scholar with the CSIRO Energy, Newcastle, Australia. All the paper presentations were followed by a Q/A session where the respective session chairs asked questions if they had any and the attendees were allowed to address any and all of their doubts. After the end of each Track the respective Session Chair were given a Memento as a token of appreciation for taking the time out of their busy schedules to attend the conference whilst addressing the

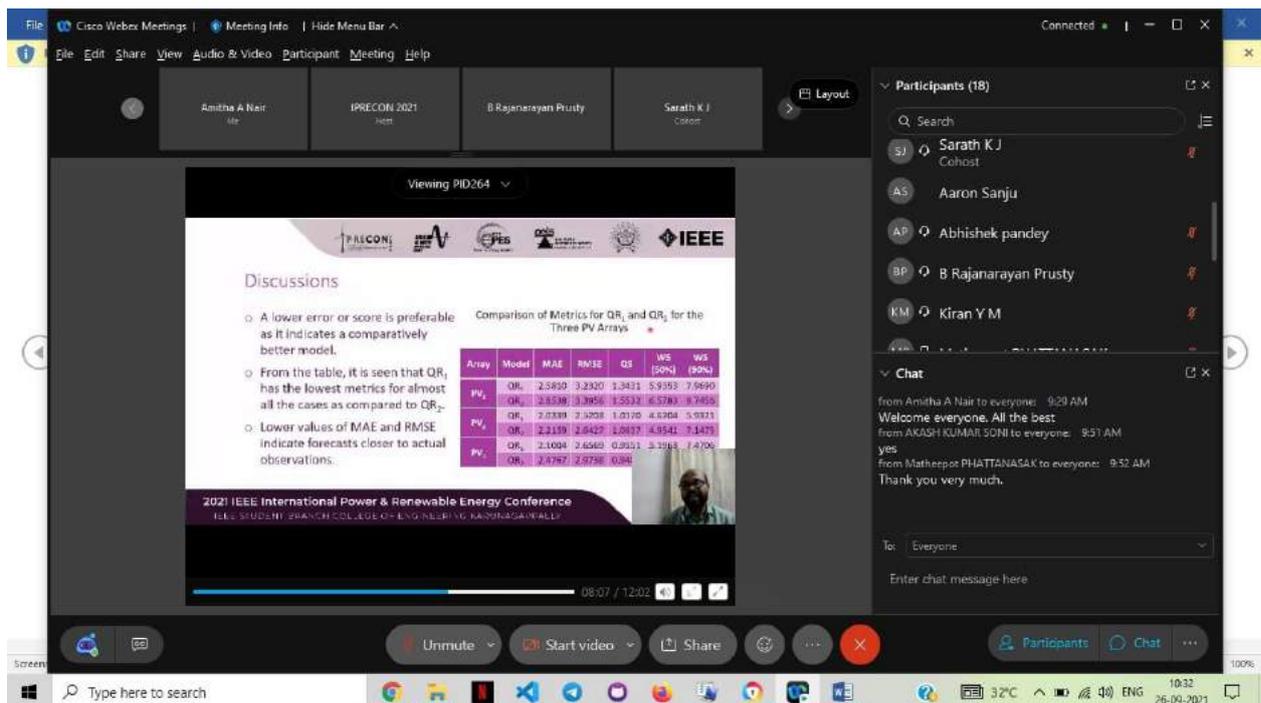
responsibilities of being a Session Chair. All the tracks in the First Session ended at and around 12: 30 IST.



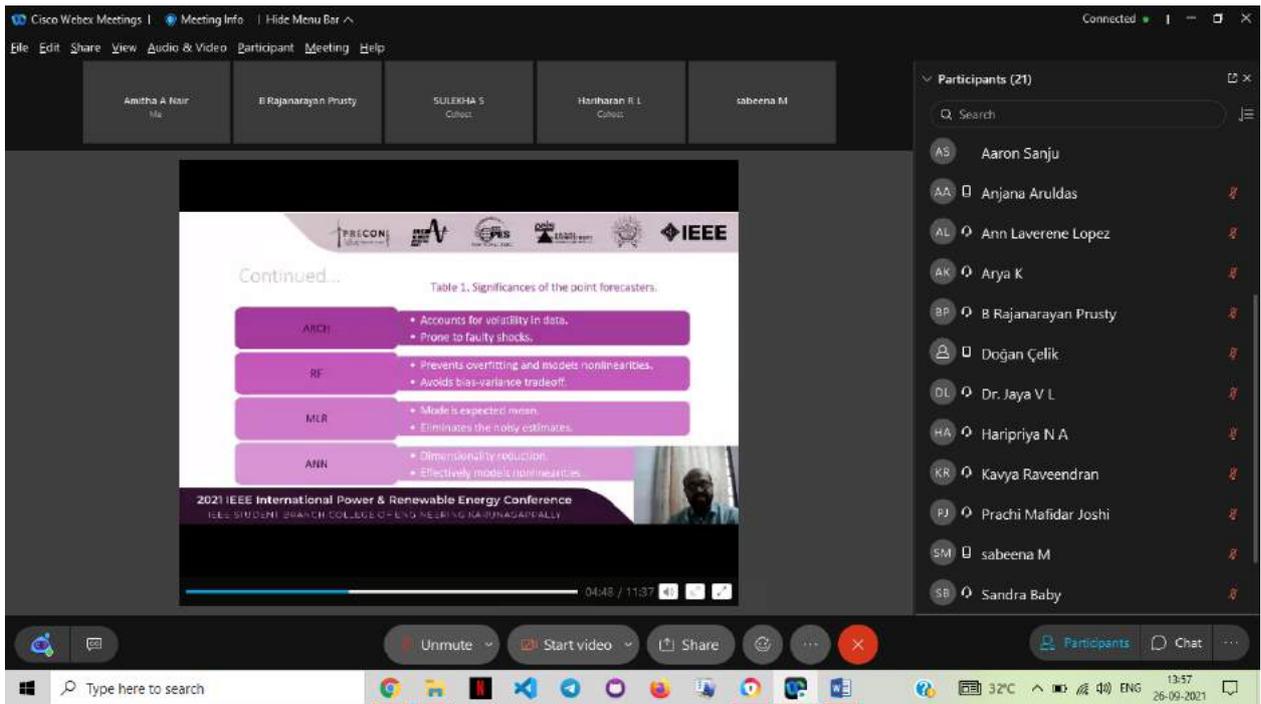
The Second Session consisting of Tracks 16 through 18 started simultaneously at 1: 30 PM IST and ended at 3: 30PM IST. Track 16 was on the Topic Artificial Intelligence Techniques & Deep Learning consisting of 6 Paper Presentations. The Session Chairs were Mrs. Ameena Beevi PhD

Scholar at APJ Abdul Kalam Technical University and the Assistant Professor at the Sree Buddha College of Engineering Elavumthitta, Mr Chempak Kumar A, PhD Scholar in Computer Science and Engineering at the University of Kerala and an Assistant Professor at the College of Engineering Muttathara and Mr Hariharan L, Research Scholar at the National Institute of Technology Karnataka in Information Technology.

Track 17 was on the topic Communication & Allied consisting of 6 paper presentations. The Session Chair was Mr. Jihās Khan a PhD Scholar from the National Institute of Technology, Calicut.

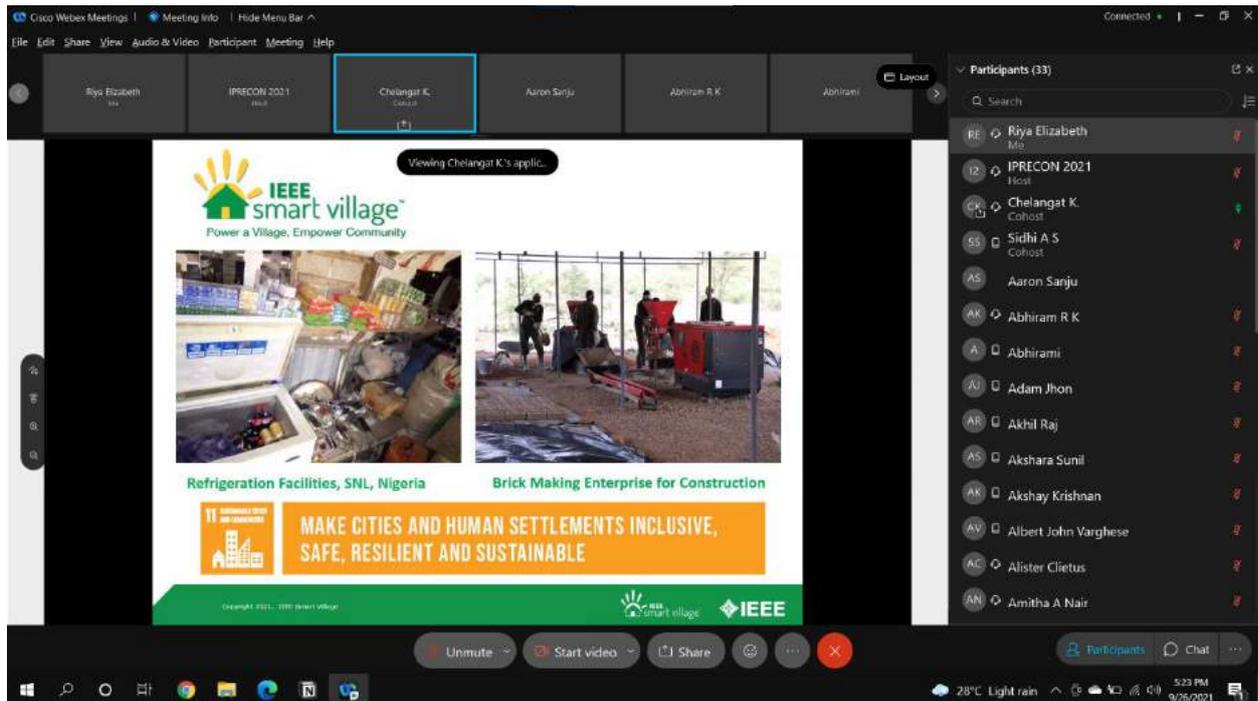


Track 18 was on the Topic Surveillance and Monitoring consisting of 4 paper presentations. The Session Chairs were Mr. Elangovan K, PhD Scholar in the Department of Avionics at the Indian Institute of Space Science and Technology, Trivandrum and Mrs. Sabeena K, advisor of IEEE Student Branch College of Engineering Karunagappally and the Assistant Professor of the Computer Science Department at the same college.



Just as in the morning session all the paper presentations were followed by a Q/A session where the respective session chairs asked questions if they had any and the attendees were allowed to address any and all of their doubts. After the end of each Track the respective Session Chair were given a Memento as a token of appreciation for taking the time out of their busy schedules to attend the conference whilst addressing the responsibilities of being a Session Chair. All the tracks in the Second Session ended at and around 03: 30 IST thus marking the end of all the paper presentations of IPRECON 2021. It was truly an extravagant journey the past 3 days filled with so much knowledge and wisdom making us even more inspired to make the next edition of IPRECON an even greater success.

HUMANITARIAN TRACK

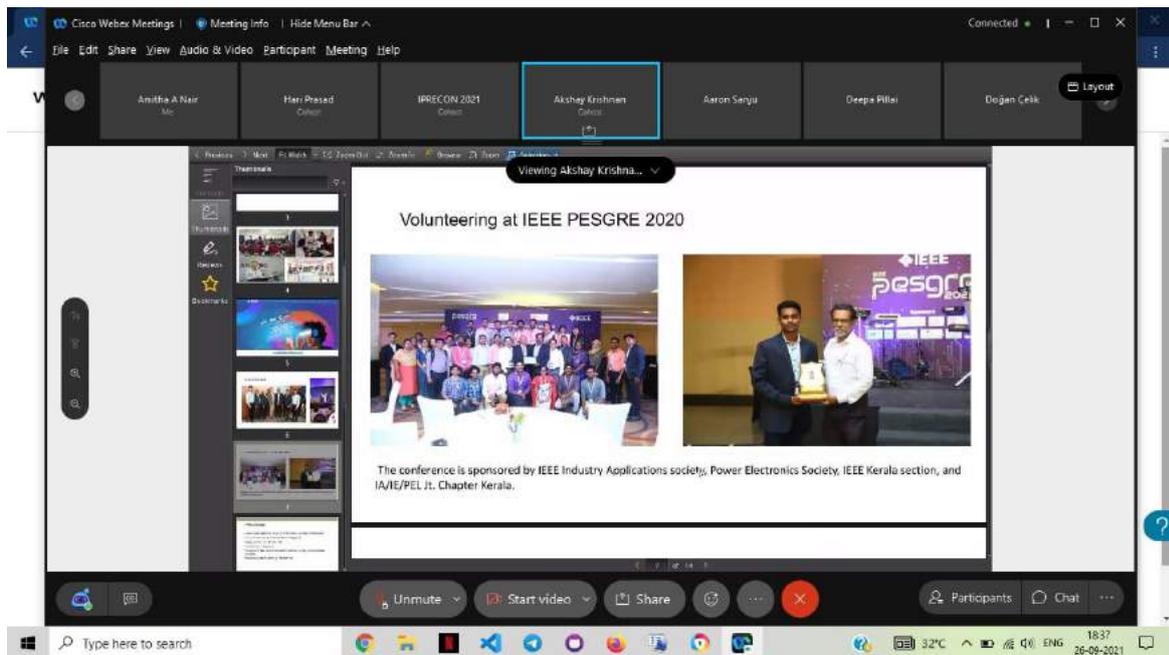
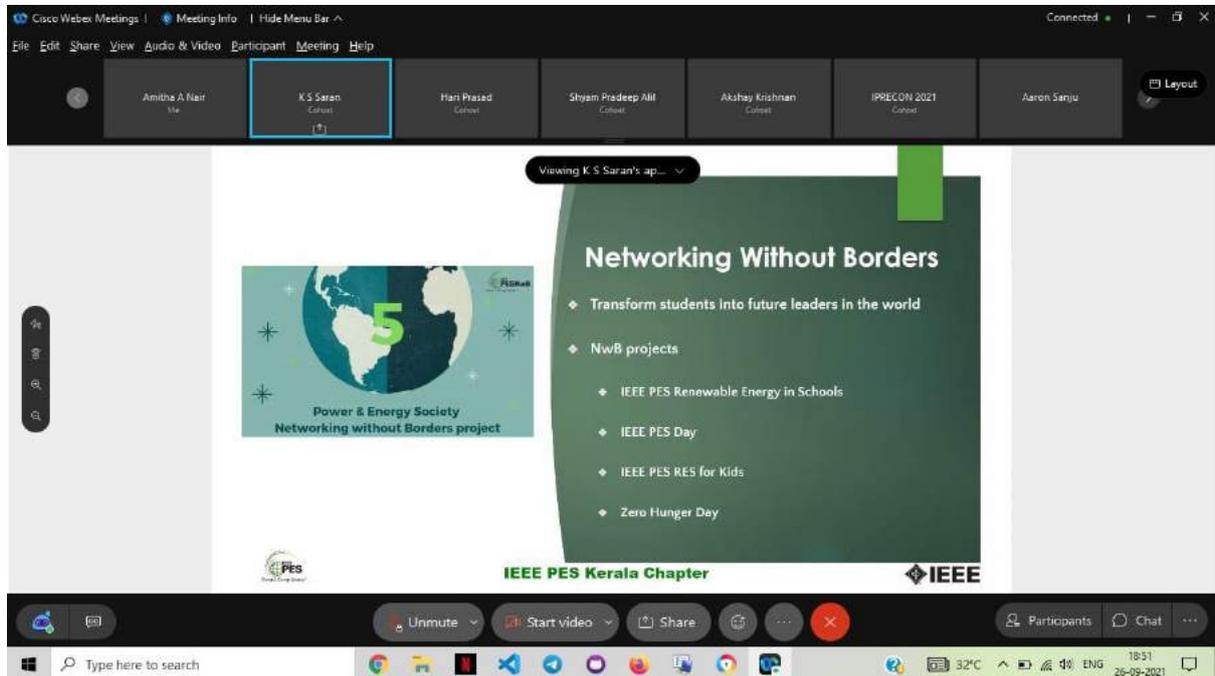


Up next was a Humanitarian Track by Ms. Mercy Chelangat K, Founder of TechGaa Hub and an Energy Access & EV Researcher on the Topic of Humanitarian Activities in the Power and Energy Sector. The session started at 5: 00 PM and concluded around 6: 00 PM IST. With this session Ms. was able to enlighten us about the several Humanitarian activities which were made possible by her involvement and what more could be done in the Power and Energy Sector to further its capabilities. It was an informative and at the same time a very interesting Session. She was kind enough to answer the doubts of the attendees and it suffices to say everyone walked away from that session with a greater mindset and motivation. For all the help and support she had provided she was given a memento as a token of appreciation.

IAS/PES YOUNG PROFESSIONALS TRACK

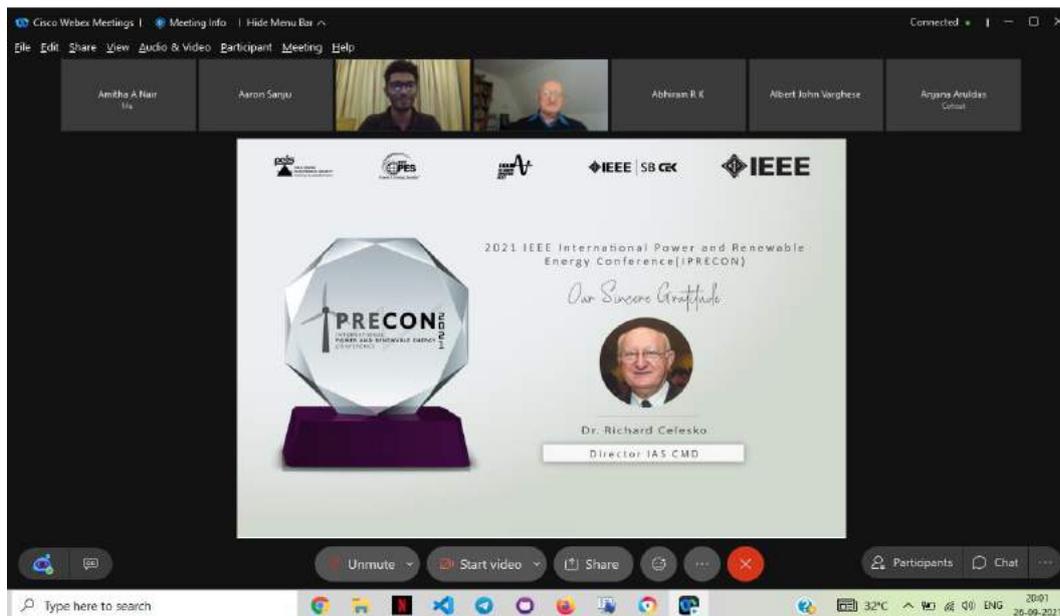
Up next was a, IAS/PES YOUNG PROFESSIONALS TRACK on Benefits of IAS/PES memberships. The session started at 6:00 PM and concluded around 7:00 PM IST. With this session Mr. K S Saran, IAS Young Professional & Junior Engineer, Indian Railways, Mr. Shyam Pradeep Alil, PES Young Professional, Co-Founder & COO, Infusory Future Tech Labs Pvt. Ltd, Mr. Sreekes E, PES Young Professional, Assistant System Engineer, Tata Consultancy Services and Mr. Akshay Krishnan, IAS Young Professional, Software Development Engineer, Carestack were able to enlighten us about the several experiences & activities which were made possible by their involvement and what all opportunities can be explored by being an active hardworking member. The moderator for panel discussion was Mr. Hari Prasad, PES Young Professional,

Co-Founder Zellab Dynamics. It was an informative and at the same time a very interesting Session. They all were kind enough to answer the doubts of the attendees and it suffices to say everyone walked away from that session with a greater mindset and motivation. For all the help and support they had provided they all were given a memento as a token of appreciation.



CLOSING CEREMONY

The Closing Ceremony was scheduled to start at 07: 30 PM IST. The Ceremony started with a Welcome Address by Ms. Jemi Jose the publicity chair of IPRECON 2021. After the Welcome Address Prof. V K Damodaranm, Advisor of IEEE Power and Energy Society Kerala Chapter and Dr. Shay Bahramirad the Founder of IEEE Power and Energy Society WiP and finally Dr. Peter Magyar, Industry Applications Society Chapters and Membership Department Ex-Chair were invited, respectively to share their insights and to deliver the Closing Remarks for IPRECON 2021 and were given Mementos for all their support. To be able to hear from such respected and knowledgeable people meant a lot to the IPRECON 2021 Team and having your support was the number one motivation for all of us to surpass our limits to make IPRECON 2021 to the level it is currently on.

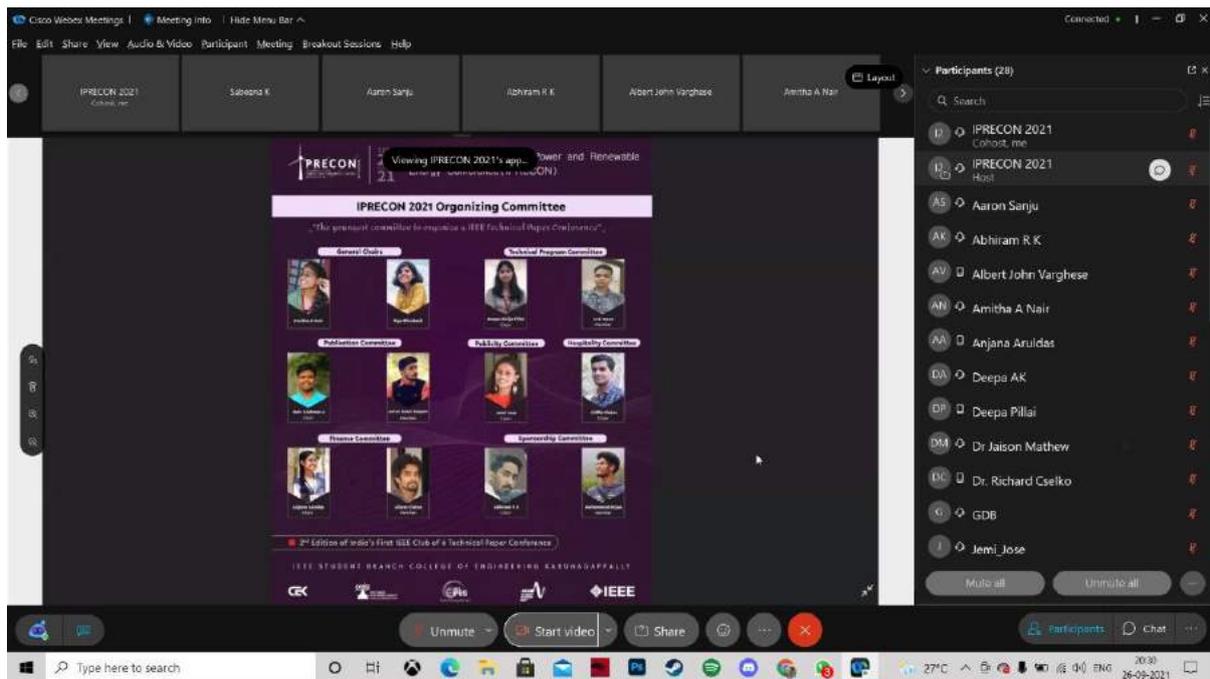


After receiving their kind words and support, Dr. Richard Cselko the Chair of IEEE Industrial Application Society Chapters and Membership Department Club of 6 Conference activities and Dr. Lillykutty Jacob the Chairperson of the Conference Activity Board IEEE Kerala Section and Dr. Jaison Mathew from the Government Engineering College, Thrissur and Dr. Biju K the Treasurer of IEEE Kerala Section and Prof. Deepa A K the vice chair of IEEE Woman in Engineering Affinity Group Kerala Section and lastly Prof. Sabeena K the advisor of IEEE Student Branch College of Engineering Karunagappally were invited respectively to provide their valuable thoughts and remarks and to give the Felicitations and were given Mementos for all that they have done for us and for their kind words. Their words of Praise and Encouragement made us feel like all the time and energy spend on planning and executing IPRECON 2021 with perfection has finally paid off there by making us feel really fulfilled and made us realize how grateful we are for their presence.

After receiving the Felicitations from the Esteemed guests, Ms. Anjana Aruldas the Financial Chair of IPRECON 2021 was invited to deliver the Vote of Thanks and with that IPRECON 2021

came to conclusion. It was truly an eye-opening Journey and since we were able to secure more than quadruple the number of papers, we got for IPRECON 2020. Even though we encountered some difficulties during these 3 days virtual conference but it is quite natural while hosting a virtual event of this scale, we were able to quickly overcome them and the experience was very valuable because now we can avoid the issue altogether in the Future. Armed with the Knowledge from our past mistakes and the tremendous amount of support we receive from the IEEE Community every day we are most certain we will be able to do many great things and make the Community Proud.

IPRECON 2021 is a fully student-led conference handled and organized by the final and pre-final year undergraduate engineering students of College of Engineering Karunagappally.



IPRECON 2021 was successfully able to exceed everyone’s expectations. Everyone Involved in the conference had quite an exhilarating time as were evident by their reviews. It was indeed the beginning of the CLUB OF 6 Conferences in India and IEEE SB CEK takes immense pride to be the one to come up with such an endeavour. IPRECON 2021 enlightened not only the youth, but even the professionals into a path of diverse technical Advancements and was indeed a full-fledged conference.