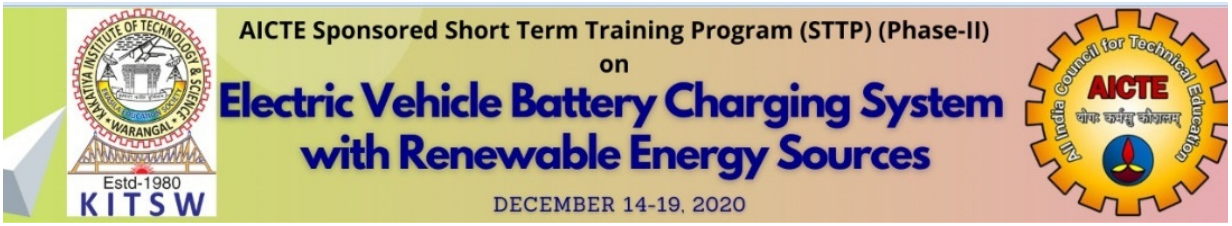

STTP- Phase-II

14th - 19th December 2020

Coordinator

Prof. C. Venkatesh

Professor & Head

Dept. of EEE

Co-coordinator

Prof. V. Rajagopal

Professor, Dept. of EEE

Organized by

Department of Electrical & Electronics Engineering

Kakatiya Institute of Technology & Science, Warangal

(An Autonomous Institute under Kakatiya University)

(Accredited by NAAC with 'A' Grade)

Opp: Yerragattu Gutta, Hasanparthy (M)

Warangal-506015 (TS), INDIA

Message from Coordinator

The Department of EEE, KITS Warangal thank AICTE, New Delhi for sanctioning the STTP on Electric Vehicle Battery Charging System with Renewable Energy Sources (EVBCS). Under this pandemic situation, AICTE has given opportunity to conduct Online STTP. With the financial support given by AICTE, we have conducted STTP in two phases.

Electric Vehicles being an emerging area in the field of engineering, as they have advantages of pollution free and environment friendly. Electric vehicles, particularly has large research opportunity for Electrical Engineers. Integration of renewable energy sources into grid has several challenges in power electronic converters, islanding operation, power quality and hybrid energy sources integration. Further, increasing use of electric vehicles and battery charging system into grid requires a much contribution by academicians and industry.

This STTP is designed with speakers from IITs (Delhi, Madras, Hyderabad), NITs (Warangal, Bhopal, Raipur), Deggrendorf University (Germany) and industries (Reva Electric Vehicles, Tata Elxsi, Mathworks, Valeo India, Fuji Electric). Sessions are designed to meet research input and exposure to current status in industry. **Phase-I of STTP was conducted during Nov. 2-7, 2020 and Phase-II of STTP was conducted during Dec. 14-19, 2020.**

I take this opportunity to thank our institution Management for permitting to conduct STTP. My sincere thanks to Prof. K. Ashoka Reddy, *Principal, KITSW* for supporting to conduct STTP. I offer my thanks Prof. V. Rajagopal, *Cocoordinator of STTP* for supporting in organizing the STTPs. Also, thanks to Core Technical Committee and Organizing Committee members for helping in designing brochure, conduction of online sessions, taking daily feedback and conduction quiz.

Prof. C. Venkatesh
Coordinator, EVBCS
HOD, EEE Dept.

CONTENTS

ABOUT THE STTP

Energy is a need in the modern world, but fossil fuel based energy system is polluting and depleting existing reserves. Environmental awareness is worldwide increasing. New paradigms are emerging, like the Electric Vehicle (EV), the Smart Grids (SG), the Vehicle-to-Grid (V2G), and the Electrical Markets (EM). Renewable energy sources (RES) and electric vehicle play an important role for a gradual transition. Also EVs integration on current electrical distribution network, without violating the system's technical restrictions, requires electrical data consumption analysis and smart charging approaches, where EV batteries charging or discharging processes need to be coordinated among the several users.

The novel grid techniques are demonstrated for the optimal integrated operation of renewable resources and electric vehicle to increase penetration of renewable energy. The distribution control system has to manage a charge and discharge strategy to support mismatching between load and renewable generation through V2G technology.

The objectives of this STTP are to

- Impart knowledge on the Basic EV Battery Charging Station (BCS) with RES
- Discuss the challenges in BCS and focuses on V2G systems, smart charging, to use EV batteries as a frequency response reserve, spinning reserve and non-spinning reserve for power regulation and keep a stable frequency and power quality
- Design and analyze the BCS with RES in MATLAB. Enable the students and researchers to acquire knowledge through hands-on experience in MATLAB.

This STTP is to provide opportunity to practitioners, researchers and people from industry to discuss the progress on state-of-the-art research and the practical usage of EVBCS, focusing on the application and the technologies relying on it. EVBCS is very potential area of study where students can be guided to take up projects both at UG and PG level. Hence hands-on training to the faculty of engineering colleges will make them competent to guide students on good projects/dissertations.

BENEFITS TO THE FACULTY

- Faculty will get trained in the area of EVBCS
- Faculty will start guiding meaningful projects to UG and PG students.
- Faculty will be introduced to EVBCS research.

STTP COURSE CONTENTS

- Power quality in the distribution system in the presence of RES
- Electric vehicles
- Solar PV system and MPPT
- Implementation of battery charging station
- Optimization techniques and converter design
- Design and analysis of EV BCS with RES

కిట్స్‌లో ఎస్‌టీటీపీ బ్రోచర్ ఆవిష్కరణ

నవతెలంగాణ-హసన్‌పర్తి

గ్రేటర్ 57వ డివిజన్ అంబాల క్రాస్‌రోడ్డులోని కిట్స్ వరంగల్ క్యాంపస్‌లో శనివారం ఏఐసీటీఈ స్పాన్సర్డ్ ఎస్‌టీటీపీ బ్రోచర్‌ను, అడ్మినిస్ట్రేషన్ బిల్డింగ్‌ను కళాశాల ప్రిన్సిపాల్ డాక్టర్ కె.అశోక్‌రెడ్డి ఆవిష్కరించారు. అనంతరం క్యాంపస్ ఆవరణలో మీడియాతో మాట్లాడుతూ ఎలక్ట్రిక్ వెహికిల్స్, బ్యాటరీ చార్జింగ్ సిస్టమ్స్ పునుత్పాదక ఇంధన వనరుల యొక్క టైమ్ టెక్నాలజీలను ఏర్పుకోవడానికి ఈ ఎస్టీటీపీ యొక్క లక్ష్యం, అత్యాధునిక సాంకేతిక అంశాలపై పరిశోధన అవగాహన, ప్రాజెక్టుల రూపకల్పనపై శిక్షణ చర్చలు జరుగుతాయని తెలిపారు. డిపార్టుమెంట్ ఆఫ్ కేసీఈ కిట్స్ వరంగల్ నవంబర్ 2020 జనవరి 2021 మధ్య మూడు దశల్లో 5జీ డిజైన్ డెవలప్‌మెంట్ యూసింగ్ 5జీ డిజైన్ అండ్ డెవలప్‌మెంట్ అంశంపై ఏఐసీటీఈ స్పాన్సర్డ్ షార్ట్ టర్మ్ ట్రైనింగ్ ప్రోగ్రాం నిర్వహిస్తున్నట్లు ఆయన తెలిపారు. నవంబర్ 2 నుంచి 7 వరకు ఎస్‌టీటీపీ 1, డిసెంబర్ 14 నుంచి 19 వరకు ఎస్‌టీటీపీ 2, జనవరి 18 నుంచి 23వ తేదీ వరకు ఎస్‌టీటీపీ కొనసాగుతుందన్నారు. బేసిక్ కమ్యూనికేషన్ సిస్టమ్, సిమ్యూలేషన్‌పై నాలెడ్జ్‌ని, 5జీలో ఉన్న సవాళ్లను చర్చించడం, మ్యాట్ ల్యాబ్‌లో బేసిక్ 5జీ కమ్యూనికేషన్ సిస్టమ్‌ని డిజైన్ చేయడం, విశ్లేషించడం, ఈఎస్‌టీటీపీ యొక్క ప్రధాన లక్ష్యమని తెలిపారు. ఈ కార్యక్రమంలో కోకోఆర్డినేటర్ వి.నర్సింహా, ఈసీఈ విభాగాధిపతి డాక్టర్ బి.రమాదేవి, డీన్ సాక్ డాక్టర్ జి.రమోత్తంరెడ్డి, ఎస్.పీ.గిరిజ, డాక్టర్ ఎం.రాజు, విద్యార్థి వ్యవహారాల ప్రతినిధి డాక్టర్ జి.రమోత్తంరెడ్డి, ఈసీఈ అసోసియేట్ ప్రొఫెసర్ డాక్టర్ డి.ప్రభాకరాచారి పాల్గొన్నారు.

కిట్స్‌లో ఎస్‌టిటిపి ఫేస్-2 ప్రారంభోత్సవం

వరంగల్, డిసెంబర్ 14, (ప్రజాతంత్ర ప్రతినిధి) : డిపార్ట్మెంట్ ఆఫ్ ఎలక్ట్రికల్ అండ్ ఎలక్ట్రానిక్స్ ఇంజనీరింగ్ (ఇఇఇ), కాకతీయ ఇన్‌స్టిట్యూట్ ఆఫ్ టెక్నాలజీ అండ్ సైన్స్, వరంగల్, తెలంగాణ వారికి ఆల్ ఇండియా కౌన్సిల్ ఫర్ టెక్నికల్ ఎడ్యుకేషన్ (ఎఐసిటిఇ) స్పాన్సర్ చేసిన స్వల్పకాలిక శిక్షణా కార్యక్రమం (ఎస్‌టిటిపి) (దశ -2) వన్ వీక్ ఆన్‌లైన్ ప్రోగ్రాం నిర్వహిస్తోంది.దీనిని "ఎలక్ట్రిక్ వెహికల్ బ్యాటరీ ఛార్జింగ్ సిస్టమ్ విత్ రెన్యూవబుల్ ఎనర్జీ సోర్సెస్" అనే సాంకేతిక అంశంపై 14 నుండి 19 డిసెంబర్ వరకు వారం రోజుల ప్రోగ్రాం నిర్వహిస్తున్నట్లు ప్రిన్సిపాల్ ప్రొఫెసర్ కె.అశోకరెడ్డి తెలిపారు. ఈ సందర్భంగా ముఖ్య అతిథిగా ఐఐటి. ఢిల్లీ ఈఈఈ విభాగపు ప్రొఫెసర్ జి.భువనేశ్వరి మాట్లాడుతూ ప్రస్తుత ఇంధన శక్తికి ప్రతిక్షేపకంగా పునరుత్పాదక శక్తిపై పరిశోధన లు పెద్ద ఎత్తున చేపట్టి వినూత్న సాంకేతిక విధానాలను ఆవిష్కరించాలన్నారు. విద్యుత్ శక్తి ఉత్పత్తి, పొదుపు, సరఫరా, మొదలగు వాటిని బేస్ చేసుకొని గ్రీన్ యాజమాన్యా పద్ధతులను రాబట్టేందుకు కృషి చేయాలన్నారు. పరిశోధకులకు, విద్యార్థుల కు సాంకేతిక ప్రాజెక్టుల రూపకల్పన కు శిక్షణ ఇవ్వాలి అని తెలిపారు. ఈ సందర్భంగా ప్రిన్సిపాల్ ప్రొఫెసర్ కె. అశోకరెడ్డి మాట్లాడుతూ ఎలక్ట్రిక్ వెహికల్స్, బ్యాటరీ ఛార్జింగ్ సిస్టమ్స్ మరియు పునరుత్పాదక ఇంధన వనరుల యొక్క ప్రజా ఉపయోగకరం టెక్నాలజీల పై శిక్షణ ఇవ్వడం ఈ ఎస్టిటిపి లక్ష్య అన్నారు. అత్యాధునిక సాంకేతిక అంశాలపై ప్రోజెక్టుల రూపకల్పన పై శిక్షణ తో పాటు చర్చలు జరుగుతాయని తెలిపారు. రాజ్యసభ ఎంపి, కళాశాల కార్యదర్శి, కరస్పాండెంట్ కెప్టెన్ వి.లక్ష్మీకాంతా రావు, కోశాధికారి పి.నారాయణ రెడ్డి, ఎఐసిటిఇ స్పాన్సర్ చేసిన ఎస్టీటీపీని పొందినందుకు మొత్తం జట్టును అభినందించారు. ఈ కార్యక్రమంలో కిట్స్‌దఖ్ఖు ప్రిన్సిపాల్, ఎస్‌టిటిపి కైర్మన్, డాక్టర్ కె.అశోక రెడ్డి, ప్రొఫెసర్ అండ్ హెడ్, ఇఇఇ విభాగం, ఎస్‌టిటిపి కన్వీనర్, కో-ఆర్డినేటర్, డాక్టర్ సి. వెంకటేష్‌బీ డీన్, అకడమిక్ అఫైర్స్, కో-కోఆర్డినేటర్ డాక్టర్ వి.రాజగోపాల్, కో-కన్వీనర్ ప్రొఫెసర్ వి.రామయ్య, అసోసియేట్ డీన్ విద్యార్థి వ్యవహారాలు ఎం. నర్సింహారావు, ఇఇఇ అధ్యాపకులు డాక్టర్ బి.జగదీష్ కుమార్, డాక్టర్ పి.నాగార్జున రెడ్డి, డాక్టర్ మంజుశ్రీ, డాక్టర్ మధుకర్ రావు, అసోసియేట్ ప్రొఫెసర్, పిఆర్ఓ. డాక్టర్ డి.ప్రభాకరా చారి పాల్గొన్నారు.

BROCHURE

AICTE Sponsored
Short Term Training Program (STTP)
on
Electric Vehicle Battery Charging System with Renewable Energy Sources

Phase-II December 14 - 19, 2020

Registration Form

Name:_____

Designation:_____
Organization:_____

Address for Correspondence:

_____
_____
_____
_____PIN code_____
E-mail:_____

Whatsapp Mobile No._____

Category: Academic/Industry/others

Signature of the Participant:

Date: _____

Place: _____

Participants need to fill this registration form and upload the scanned copy in PDF format in the below registration link.

Download the sample word file for registration:
https://drive.google.com/file/d/10I1L5fcD7hlkEH7vrujX9_KMgW_Dqt7A/view?usp=sharing

Registration Link:
https://forms.gle/kgduofz3szF6gsbH8

Last Date for Registration: December 09, 2020

ELIGIBILITY & REGISTRATION: No registration fee
The Faculty members, research scholars, PG students of AICTE approved Engineering colleges, and Polytechnic college faculty working in the field of Power Electronics and Renewable Energy are eligible to apply. Registrations will be accepted subjected to the availability on a first-come, first-serve basis and area of specialization with a maximum attendance of 100. Short-listed candidates will be informed through Email.

FACULTY ATTENDED FOR PHASE-I NEED NOT APPLY

MODE OF CONDUCTION: Online Mode
Online meeting link will be sent through Whatsapp and registered email for the short-listed candidates. Since hands-on sessions will be conducted in MATLAB, all the participants are requested to install MATLAB tool in their computers.

TEST AND CERTIFICATE:
- A test shall be conducted at the end of the program.
- The certificates will be issued to those participants who have attended the program with minimum 80% attendance and scored minimum 60% marks in the test.

Chief Patron
Capt. V. Lakshmikantha Rao, *M.P. (Rajya Sabha)*
Secretary & Correspondent, KITS Warangal (KITSW)

Patron
Sri P. Narayana Reddy, Treasurer, KITSW

Chairman
Prof. K. Ashoka Reddy, Principal

Convener & Coordinator
Dr. C. Venkatesh, Professor & Head, Dept. of EEE

Co-Convener
Prof. V. Ramaiah, Professor, Dept. of EEE

Advisory Committee:
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Dr. G. Rajender Naik, Assoc. Prof., EEE
Dr. G. Sudheer Kumar, Assoc. Prof., EEE
Dr. B. Vijaykumar, Assoc. Prof., EEE

Core Technical Committee:
Dr. G. Rajendar, Assoc. Prof., EEE
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Dr. A. Madhukar Rao, Asst. Prof., EEE
Dr. A. Rajasekhar, Asst. Prof., EEE
Dr. M. Santhosh, Asst. Prof., EEE

Organizing Committee: Faculty of Department of EEE

AICTE Sponsored
Short Term Training Program (STTP)

KITSW

Electric Vehicle Battery Charging System with Renewable Energy Sources

STTP-II (December 14 - 19, 2020)

Coordinator
Prof. C. Venkatesh
Professor & Head, Dept. of EEE

Co-coordinator
Prof. V. Rajagopal
Professor, Dept. of EEE

Organized by
Department of Electrical & Electronics Engineering
Kakatiya Institute of Technology & Science, Warangal
(An Autonomous Institute under Kakatiya University)
(Accredited by NAAC with 'A' Grade)
Opp: Yerragattu Gutta, Hasanparthy (M)
Warangal-506015 (TS), INDIA
Website: www.kitsw.ac.in
MHRD NIRF-2020
Rank Band: 201-250

ABOUT THE INSTITUTE

Kakatiya Institute of Technology and Science, Warangal popularly known as KITSW, was established in 1980 by Ekasila Education Society (EES), Warangal, a philanthropic society, with a primary objective of providing quality technical education. KITSW is recognized by the AICTE and also under section 2(F) and 12(B) of UGC act 1956. The UGC has granted autonomous status in 2014 under Kakatiya University (KU), Warangal. It is accredited by the NAAC with A grade (CGPA: 3.21) and all the UG engineering programmes are accredited by the NBA, New Delhi. Located in 68 acres of lush green sprawling campus, it is one of the premier institutes of Telangana. Over the years, it has attracted academicians of proven competence onto its faculty, augmented the infrastructural facilities, modernized laboratories, placed its products in reputed organizations all over the world and thus received recognition in industry and academia. At present, it is offering UG in ten branches of engineering, PG in six engineering specializations and MBA. The KU recognized CE, ME, E&I and CSE departments as research centers for Ph.D. programmes. The faculty at KITSW is now integrating research, innovation and incubation culture into course teaching to prepare students to gain tech skills for industry 4.0.

Warangal city is well connected to other cities by rail and road. The institute is located on Warangal - Karimnagar highway.

ABOUT EEE DEPARTMENT

Department of Electrical & Electronics Engineering (EEE) is the most sought by students in Telangana for admissions in to its programmes. Our alumni have spread over the world across MNCs, and PSUs enjoying their positions in top brands and running their own industries. The department of Electrical & Electronics Engineering (EEE) was established in the year 1994. The current intake in to UG program B.Tech (EEE) is 120 and PG program M.Tech. (PE) is 30.

The department is accredited by NBA under Tier - 1 in the year 2019. The department has dedicated and qualified faculty with 3 Professors, 6 Associate Professors, 24 Assistant Professors with 14 Doctorates, 03 Faculty members submitted PhD thesis and 06 pursuing Ph.D. in reputed Institutions/ Universities.

The department has very well equipped and modernized laboratories to cater to the needs of UG and PG programs.

- Basic Electrical Engineering Laboratory
- Power Systems Laboratory
- Power Electronics Laboratory
- Electrical Simulation Laboratory
- Control Systems & Simulation Laboratory
- Electrical Machines Laboratory
- Electrical Measurements & Instruments Laboratory
- Networks & Simulation Laboratory
- Electric Drives Laboratory
- Renewable Energy Systems Laboratory
- Power Electronics Simulation Laboratory

ABOUT THE STTP

Energy is a need in the modern world, but fossil fuel based energy system is polluting and depleting existing reserves. Environmental awareness is worldwide increasing. New paradigms are emerging, like the Electric Vehicle (EV), the Smart Grids (SG), the Vehicle-to-Grid (V2G), and the Electrical Markets (EM). Renewable energy sources (RES) and electric vehicle play an important role for a gradual transition. Also EVs integration on current electrical distribution network, without violating the system's technical restrictions, requires electrical data consumption analysis and smart charging approaches, where EV batteries charging or discharging processes need to be coordinated among the several users. The novel grid techniques are demonstrated for the optimal integrated operation of renewable resources and electric vehicle to increase penetration of renewable energy. The distribution control system has to manage a charge and discharge strategy to support mismatching between load and renewable generation through V2G technology.

The objectives of this STTP are to

- Impart knowledge on the Basic EV Battery Charging Station (BCS) with RES
- Discuss the challenges in BCS and focus on V2G systems, smart charging, to use EV batteries as a frequency response reserve, spinning reserve and non-spinning reserve for power regulation and keep a stable frequency and power quality
- Design and analyze the BCS with RES in MATLAB. Enable the students and researchers to acquire knowledge through hands-on experience in MATLAB.

This STTP is to provide the opportunity to practitioners, researchers and people from industry to discuss the progress on state-of-the-art research and the practical usage of EVBCS, focusing on the application and the technologies relying on it. EVBCS is very potential area of study where students can be guided to take up projects both at UG and PG level. Hence hands-on training to the faculty of engineering colleges will make them competent to guide students on good projects/dissertations.

BENEFITS TO THE FACULTY

- Faculty will get trained in the area of EVBCS
- Faculty will start guiding meaningful projects to UG and PG students
- Faculty will be introduced to EVBCS research

STTP COURSE CONTENTS

- Power quality in the distribution system in the presence of RES
- Electric vehicles
- Solar PV system and MPPT
- Implementation of battery charging station
- Optimization techniques and converter design
- Design and analysis of EVBCS with RES

Resource Persons:

Prof. G. Bhuvaneswari,	***Professor, IITD***
Prof. N. Viswanathan,	***Professor, NIT, Warangal***
Prof. Rajesh Kumar,	***Professor, MNIT, Jaipur***
Dr. Allabaksh Naikodi,	***Head, R&D EE Mahindra Reva EV Pvt. Ltd., Bengaluru***
Prof. Frank Denk,	***Professor, Deggendorf Institute of Technology, Bavaria, Germany***
Dr. Vasisht Bist,	***Asst. General Manager, Fuji Electric, Pune***
Debanand Singdeo, Ramana Anchuri,	**Mathworks, Hyderabad Mathworks, Pune**
Dr. D. Rakesh Chandra,	**Assistant *Professor, KITSW***
Dr. M. Santhosh,	**Assistant *Professor, KITSW***

Address for Communication
Dr. P. Nagarjuna Reddy
Asst. Professor, Dept. of EEE,
Kakatiya Institute of Technology & Science, Warangal
Contact No: +91-9908926407
Email: pnreddy.eeeskitsw.ac.in

STTP Schedule

S. No.	Day	Name	Details	Duration
1.	Monday 14.12.2020	Prof. G. Bhuvaneswari *"Power Electronic Converters for Renewable Energy Systems"*	Professor, IIT Delhi	*2 pm to 3.30 pm (1 ½ Hr)*
2.	Monday 14.12.2020	Dr. Sathishbabu *"Electrification of Vehicles and Power Electronics Role"*	Hardware design Engineer, Valeo India	*3.30 pm to 5 pm (1 ½ Hr)*
3.	Tuesday 15.12.2020	Prof. N. Viswanathan *"Modelling of DC-DC Converters for EV Applications"*	Professor, NIT Warangal	*2 pm to 3.30 pm (1 ½ Hr)*
4.	Tuesday 15.12.2020	Dr. Ujjwal Kalla *"Design and Implementation of power electronic interface for 3-phase 4-wire grid connected solar PV systems"*	Assoc. Prof., MANIT, Bhopal	*3.30 pm to 5 pm (1 ½ Hr)*
5.	Wednesday 16.12.2020	Dr. A. Madhukar Rao *Converters*	Asst. Professor, KITS Warangal	*2 pm to 5 pm (3 Hrs)*
6.	Wednesday 16.12.2020	Debanand Singdeo *"Simulation Modelling of Electric Vehicle"*	Mathworks Pvt. Ltd., Pune	*3.30 pm to 5 pm (1 ½ Hr)*
7.	Thursday 17.12.2020	Dr. D. Rakeshchandra *"Demand Side Management in a Smart Micro Grid incorporating EVs"*	Asst. Professor, KITS Warangal	*2 pm to 3.30 pm (1 ½ Hr)*
8.	Thursday 17.12.2020	Prof. Frank Denk Sri K. Harish *"Induction based EV Charging"*	Deggendorf Institute of Technology, Bavaria, Germany	*3.30 pm to 5 pm (1 ½ Hr)*
9.	Friday 18.12.2020	Prof. Rajesh Kumar *"Battery Management System"*	Professor, MNIT, Jaipur	*2 pm to 3.30 pm (1 ½ Hr)*
10.	Friday 18.12.2020	Dr. M. Santhosh *"Electric Vehicle Battery Charging Station Vs Battery Swapping Station and associated Research Aspects"*	Asst. Professor, KITS Warangal	*3.30 pm to 5 pm (1 ½ Hr)*
11.	Saturday 19.12.2020	Prof. V. Rajagopal *"Control of Grid-Tied Solar Power Generation with Improved Dynamics andPower Quality"*	Professor, KITS Warangal	*2 pm to 3.30 pm (1 ½ Hr)*
12.	Saturday 19.12.2020	Dr. Vasisht Bist *"Adding Smartness in Motor Drives"*	Asst. General Manager, Fuji Electric, Pune	*3.30 pm to 5 pm (1 ½ Hr)*
13.	Saturday 19.12.2020	Online Quiz/Test		*5.00 pm to 5.30 pm*
14.	Saturday 19.12.2020	Valedictory		*5.30 pm to 6 pm*

Inaugural Function Invitation

KAKATIYA INSTITUTE OF TECHNOLOGY & SCIENCE

WARANGAL - 506015

(An AUTONOMOUS Institute under Kakatiya University, Warangal)
(Accredited by NAAC with 'A' Grade)

Estd-1980 KITSW

INVITATION

The Management, Principal, Faculty and Staff
cordially invite you to attend the Virtual INAUGURAL SESSION of

AICTE Sponsored Short Term Training Program (STTP) (Phase-II)
On

ELECTRIC VEHICLE BATTERY CHARGING SYSTEM WITH RENEWABLE ENERGY SOURCES

Organized
by

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

Capt. V. Lakshmikantha Rao, M.P. (Rajya Sabha)
Secretary & Correspondent, KITSW
will preside over the function

Sri P. Narayana Reddy, Treasurer, KITSW
will grace the occasion

Prof. G. Bhuvaneswari, IIT Delhi
Chief Guest

DECEMBER 14, 2020 (MONDAY) AT 02:00 PM

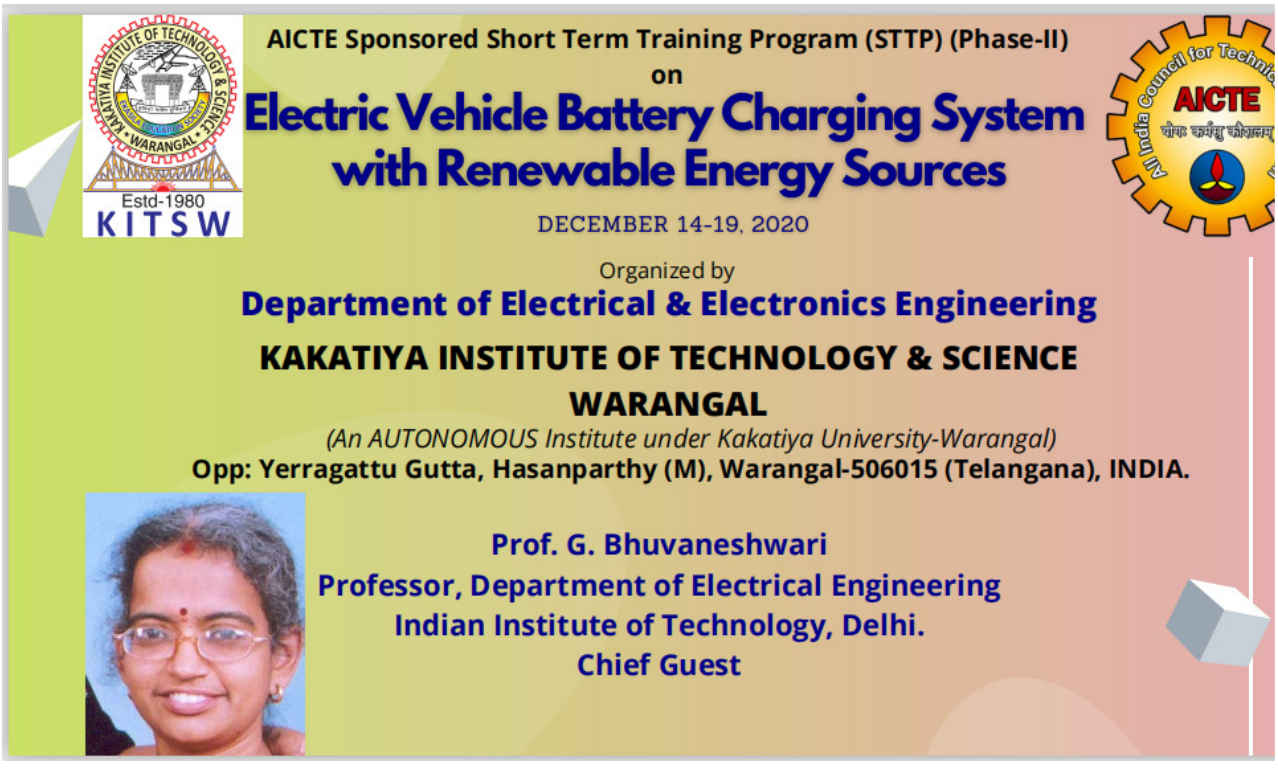
Mode: Online Mode via Google meet

Co-coordinator	*Convener & Coordinator*	*Chairman*
Dr. V. Rajagopal	**Dr. C. Venkatesh**	**Dr. K. Ashoka Reddy**
Professor, Dept. of EEE	Professor & Head, Dept. of EEE	Principal, KITSW

Inaugural Function

Inaugural function of AICTE sponsored short term training programme (STTP) entitled, electric vehicle battery charging system with renewable energy sources is started at 1.00 PM on 14th December 2020. Professor G Bhuvaneswari, *Department of Electrical Engineering, IIT Delhi* inaugurated this function as a Chief Guest. Inaugural function starts with National Anthem. Dr. Prof V Rajgopal, Co-coordinator gave a brief introduction this STTP. Prof C. Venkatesh, convener and coordinator, introduced the details and achievements of Electrical and Electronics Engineering Department of KITS Warangal. Principal, Professor K. Ashoka Reddy has given a speech about the role of FDPs to improve technical skills and knowledge. Finally, Chief Guest Prof Bhim Singh, explained about the importance these kind of STTP's to improve the technical skills of a faculty and he also explain the importance of Electric vehicles for present and future generation.

CHIEF GUEST



కిట్స్ కళాశాలలో షార్ట్ టర్మ్ ట్రైనింగ్

ప్రజాపక్షం/హనన్‌పర్తి : హనన్‌పర్తి మండల కేంద్రంలోని కిట్స్ ఇంజనీరింగ్ కళాశాలలో డిపార్ట్ మెంట్ ఆఫ్ ఎలక్ట్రానిక్స్ అండ్ కమ్యూనికేషన్ ఇంజనీరింగ్(ఈసిఈ) విభాగం ఆధ్వర్యంలో 2వ తేదీ నుండి 7వ తేదీ వరకు మొదటి దశ ప్రోగ్రాం హాండ్స్ ఆన్ ప్రాజెక్టు బేస్డ్ అప్రోచ్ ఫర్ 5జి అండ్ డెవలప్‌మెంట్ యాజింగ్ మ్యాట్ ల్యాబ్ అనే అంశంపై ఎఐసిటిఐ స్పాన్సర్డ్ షార్ట్ టర్మ్ ట్రేనింగ్ ప్రోగ్రాం(ఎఫ్‌టిపి) నిర్వహిస్తున్నామని ప్రిన్సిపాల్ ప్రొఫెసర్ కె.అశోక్‌రెడ్డి తెలిపారు.ఈ కార్యక్రమానికి ముఖ్యఅతిథిగా ఐఐటి కాన్పూర్ ప్రొఫెసర్ డాక్టర్ కె.వాసుదేవన్ ప్రారంభోత్సవం చేశారు. ఈ కార్యక్రమంలో కోశాధికారి పి.నారాయణరెడ్డి, బద్రి నరసింహం, ఈసిఈ విభాగాధిపతి ప్రొఫెసర్ ఇ.రమాదేవి, డాక్టర్ ఎం.రాజు, డి.వేణు, డాక్టర్ ధనలక్ష్మి, ఇ.సురేష్, డాక్టర్ వెంకటేశ్వర్‌రెడ్డి, వివిధ కళాశాలల నుండి 200పై చిలుకు పార్టీసిపెంట్స్, పలు విభాగాల హెచ్‌ఒడిలు, ఈసిఈ అధ్యాపకులు పాల్గొన్నారు.

6 మన తెలంగాణ www.manate

కిట్స్ కళాశాలలో స్పాన్సర్డ్ షార్ట్‌టర్మ్ ట్రైనింగ్ ప్రోగ్రాం ప్రారంభం

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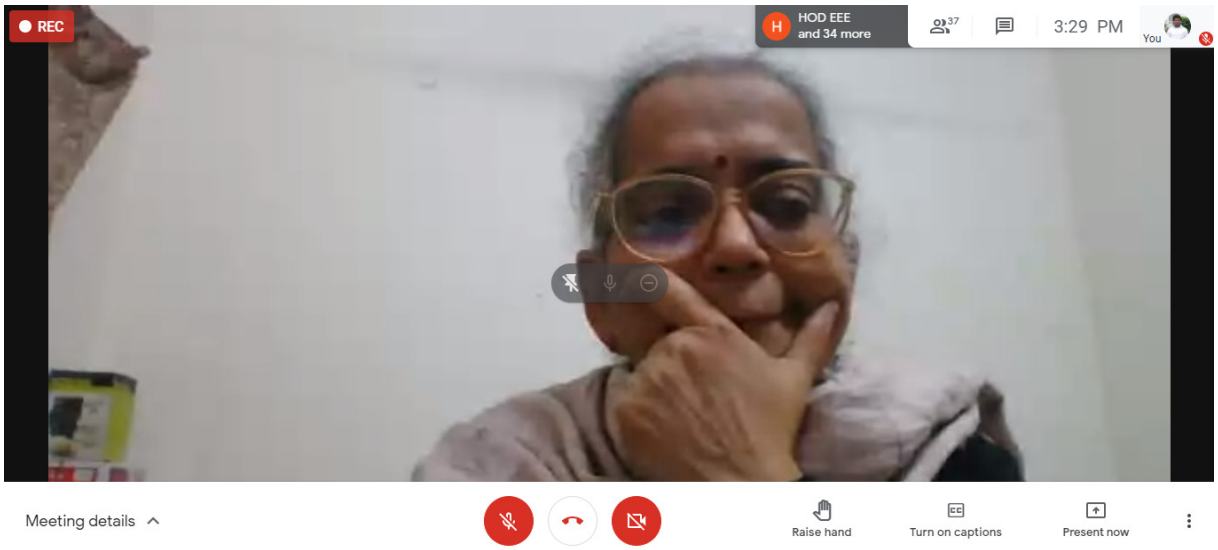
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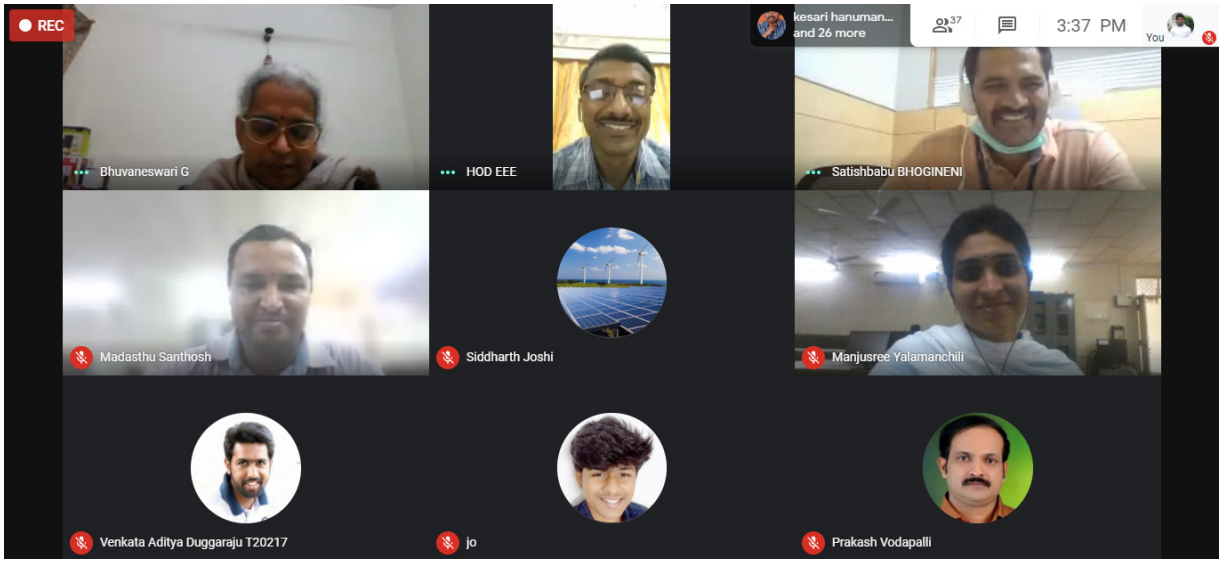
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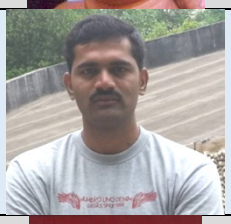
Prakash Vodapalli

Resource Persons

S. No.	Topic	Resource Person	
1.	*"Power Electronic Converters for Renewable Energy Systems"*	**Prof. G. Bhuvaneswari** **Professor, IIT Delhi**	
2.	*"Electrification of Vehicles and Power Electronics Role"*	**Dr. Sathishbabu** **Hardware design Engineer** **Valeo India**	
3.	*"Modelling of DC-DC Converters for EV Applications"*	**Prof. N. Viswanathan** **Professor** **NIT Warangal**	
4.	*"Design and Implementation of power electronic interface for 3-phase 4-wire grid connected solar PV systems"*	**Dr. Ujjwal Kalla** **Assoc. Prof., MANIT, Bhopal**	
5.	*"Battery Energy Balancing of DC-AC Converter for EV Applications"*	**Dr. A. Madhukar Rao** **Asst. Professor, KITS** **Warangal**	
6.	*"Simulation Modelling of Electric Vehicle"*	**Debanand Singdeo** **Mathworks Pvt. Ltd., Pune**	
7.	*"Demand Side Management in a Smart Micro Grid incorporating EVs"*	**Dr. D. Rakeshchandra** **Asst. Professor, KITS** **Warangal**	

8.	*"Induction based EV Charging"*	**Prof. Frank Denk** **Deggendorf Institute of Technology, Bavaria, Germany**	
9.	*"Battery Management System"*	**Prof. Rajesh Kumar** **Professor, MNIT, Jaipur**	
10.	*"Electric Vehicle Battery Charging Station Vs Battery Swapping Station and associated Research Aspects"*	**Dr. M. Santhosh** **Asst. Professor, KITS Warangal**	
11.	*"Control of Grid Tied Solar Power Generation with Improved Dynamics and Power Quality"*	**Prof. V. Rajgopal** **Professor, KITS Warangal**	
12.	*"Adding Smartness in Motor Drives"*	**Dr. Vasisht Bist** **Asst. General Manager, Fuji Electric, Pune**	

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Secretary & Correspondent, KITS Warangal (KITSW)

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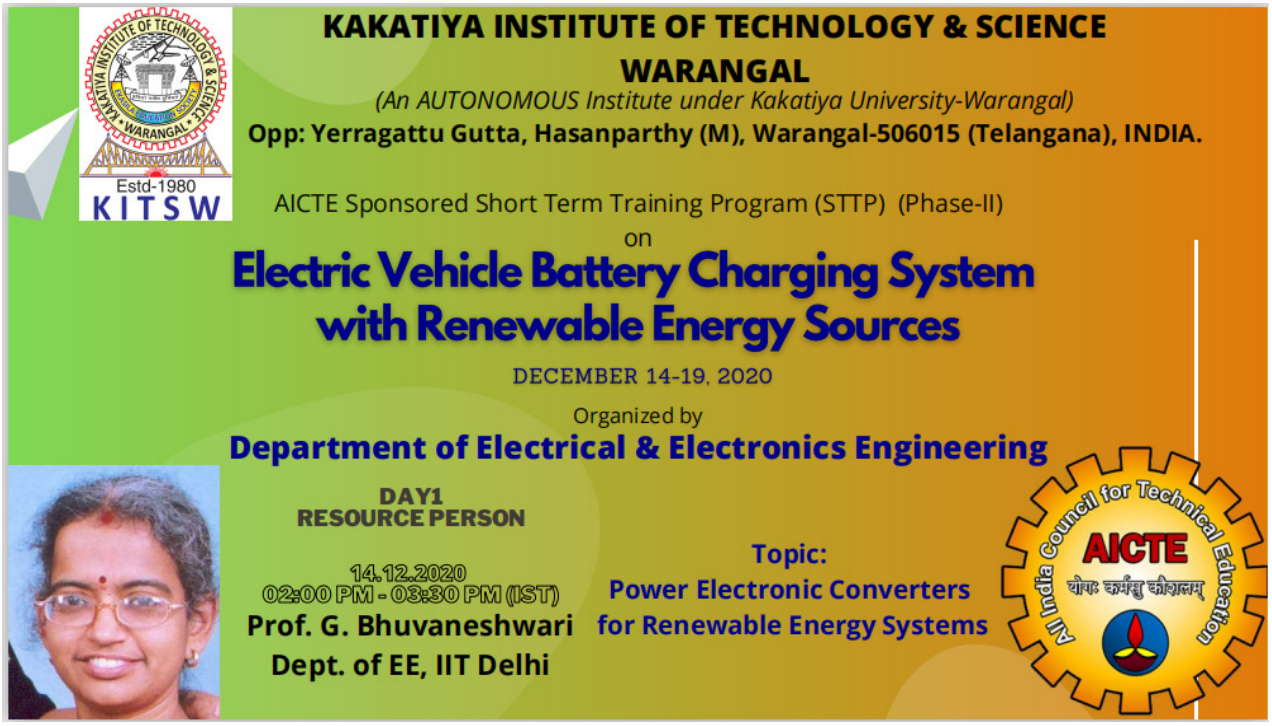
Dr. A. Madhukar Rao, *Asst. Prof., EEE*

Dr. A. Rajasekhar, *Asst. Prof., EEE*

Dr. M. Santhosh, *Asst. Prof., EEE*

Session I (2nd November 2020)

TITLE: Grid Interfaced Solar Photovoltaic System



Resource Person:

Prof. G. Bhuvaneswari

Professor, Department of Electrical Engineering
Indian Institute of Technology

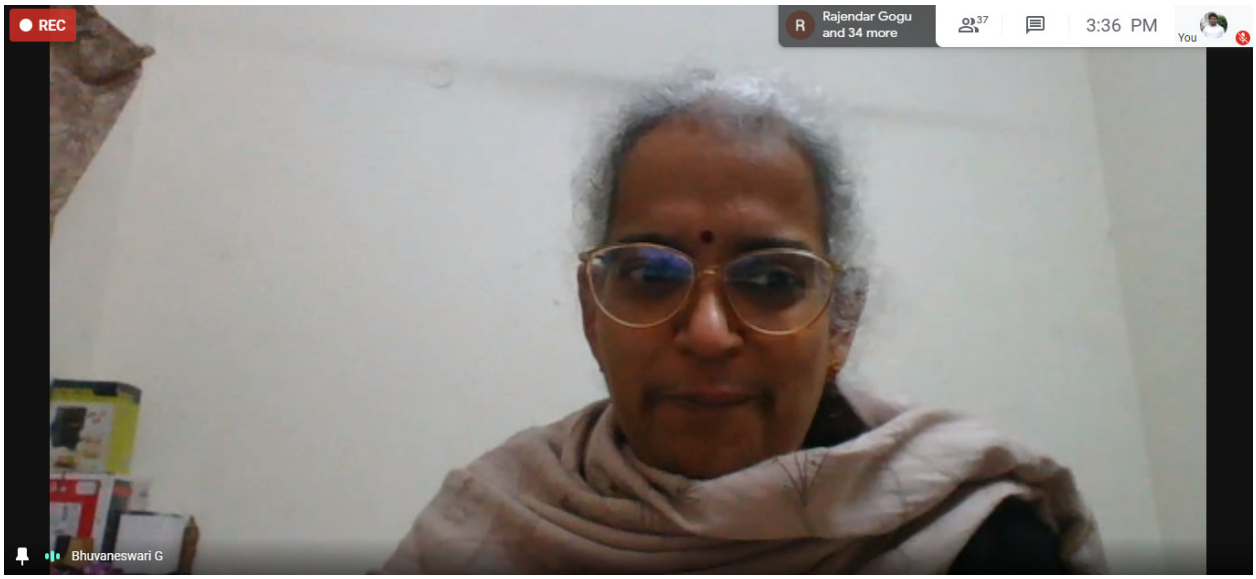
Biography:

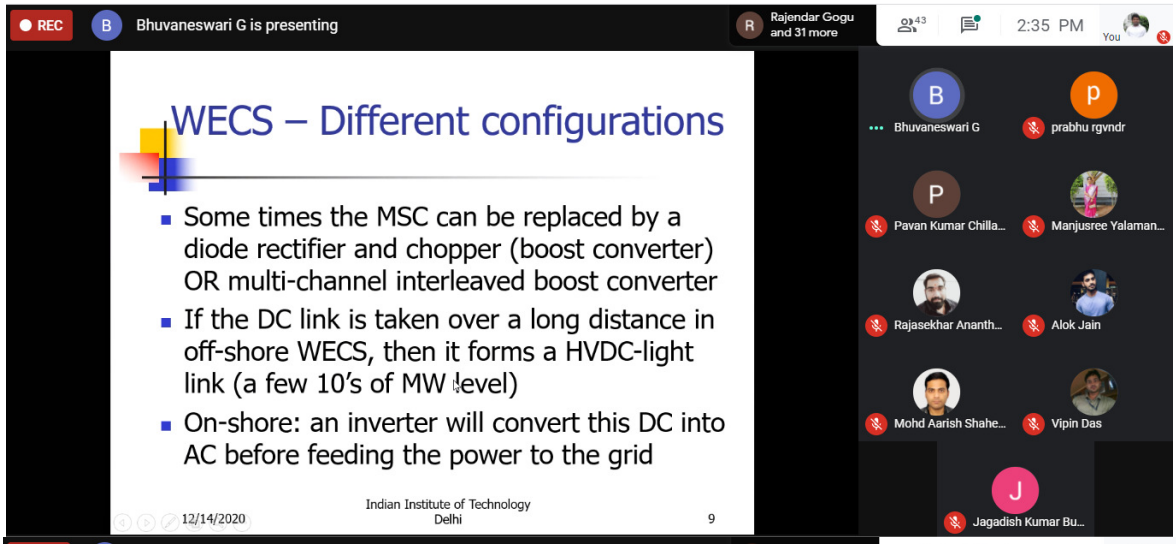
Dr. G. Bhuvaneswari has been working as a faculty member in the Indian Institute of Technology since August 1997. She did her B.E. from College of Engg., Guindy, Anna University Madras in 1985, M.Tech in 1988, and Ph.D. in 1992 from IIT Madras. After completing her Ph.D., she worked as a faculty in the Dept. of EEE College of Engg Madras for over one year; then, she worked in the Electrical Utility Company Com Ed, Chicago Illinois USA for about 3 years. After this, she returned to India to join IIT Delhi. Her areas of specialization are Power Electronics, Machines, Drives and all their application areas like power supply, power quality, HVDC, electric drives, electric vehicles, battery charging and renewable energy. She is a Fellow IEEE-USA, Institution of Engineers-India, Indian

National Academy of Engineering, Institution of Engineering & Technology-UK and IETE-India. She has over 200 publications in National and International journals and conferences.

Report: Important points covered by Prof G Bhuvaneswari

- Off shore and on shore wind energy conversion systems.
- Advantages and disadvantages of wind energy conversion systems.
- Block diagram and schematic diagrams of wind energy conversion systems.
- Power converter control for wind energy conversion systems.
- Voltage oriented control of grid side inverter.
- Solar photo voltaic with MPPT of dc link voltage controller.
- DC-DC converter systems.
- Dual active bridge.
- Electric vehicle system configuration.
- Complete battery charging system.
- Wireless power transfer for EV battery charging.
- Challenges of Electric vehicle systems.

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Bhuvaneswari G is presenting
Rajendar Gogu and 31 more
2:35 PM
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WECS – Different configurations
Some times the MSC can be replaced by a diode rectifier and chopper (boost converter) OR multi-channel interleaved boost converter
If the DC link is taken over a long distance in off-shore WECS, then it forms a HVDC-light link (a few 10's of MW level)
On-shore: an inverter will convert this DC into AC before feeding the power to the grid
12/14/2020
Indian Institute of Technology Delhi
9
Bhuvaneswari G
prabhu rgvndr
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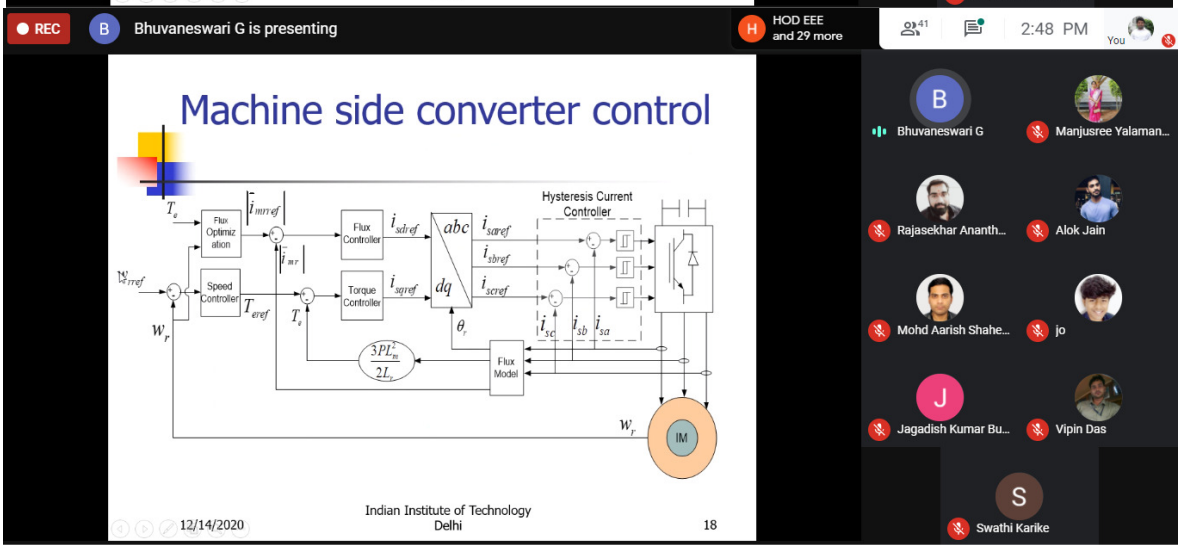
Manjusree Yalaman...
Rajasekhar Ananth...
Alok Jain
Mohd Aarish Shahe...
Vipin Das
Jagadish Kumar Bu...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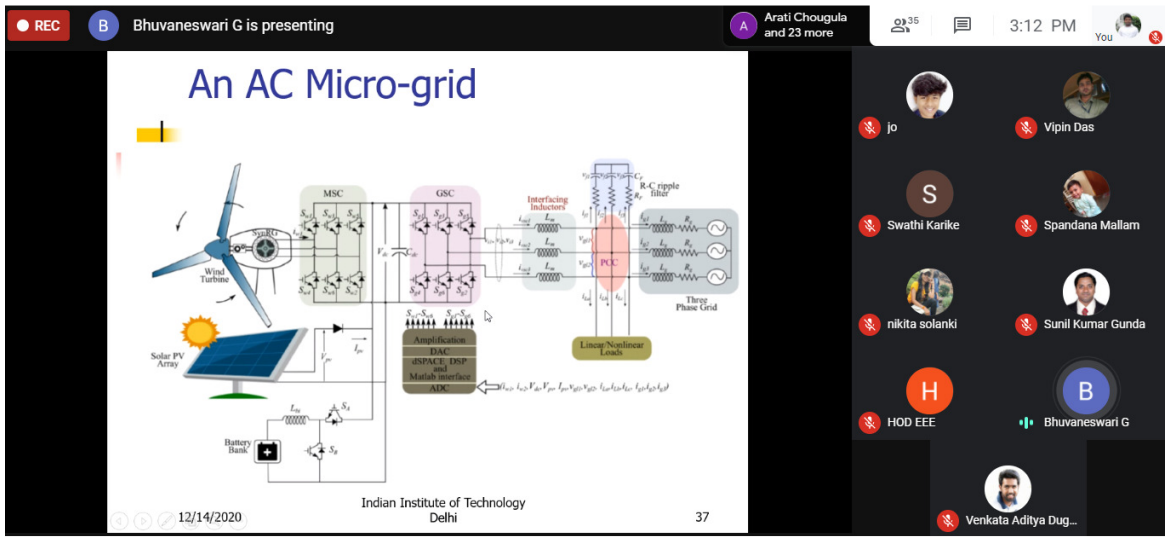
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PCC
Three Phase Grid
Wind Turbine
Solar PV Array
Battery Bank
Amplification
DAC
dSPACE DSP and Matlab interface
ADC
Linear/Nonlinear Loads
12/14/2020
Indian Institute of Technology Delhi
37
jo
Vipin Das
Swathi Karike
Spandana Mallam
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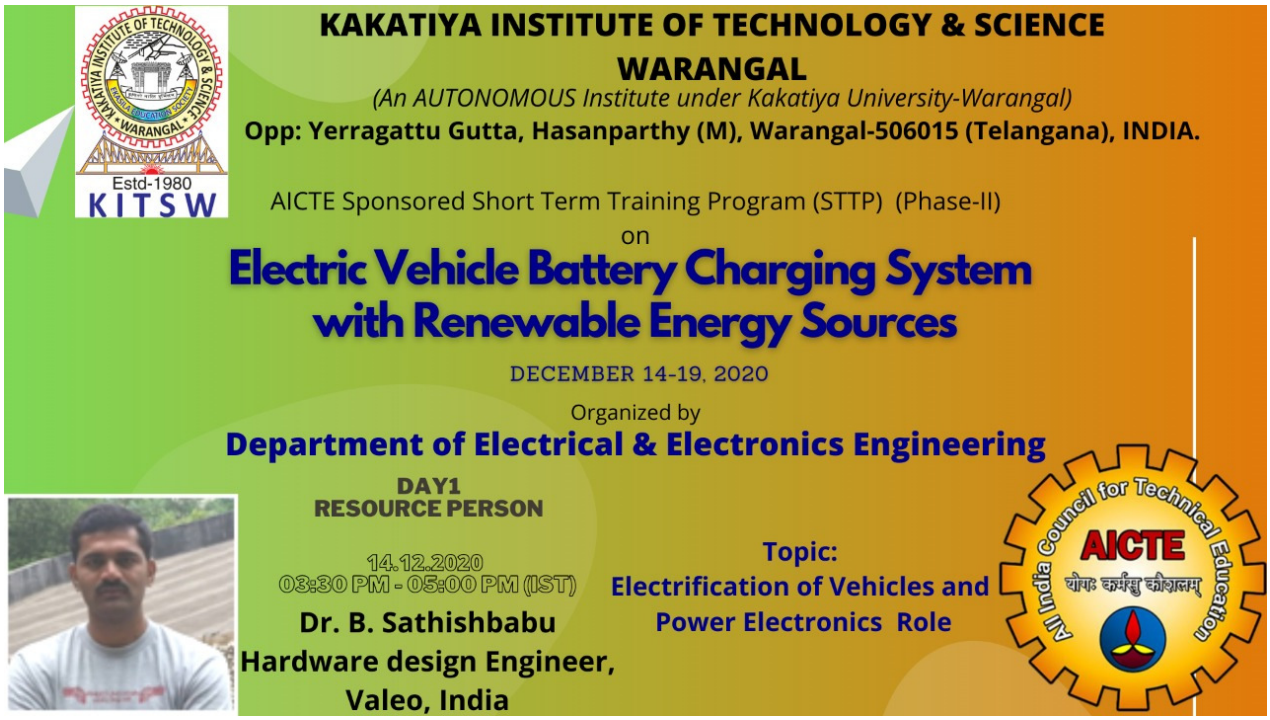
Sunil Kumar Gunda
HOD EEE
Bhuvaneswari G
Venkata Aditya Dug...

Session II (14th December 2020)

TITLE: Electrification of Vehicles and Role of Power Electronics



Resource Person:

Dr. B. Sathish babu,

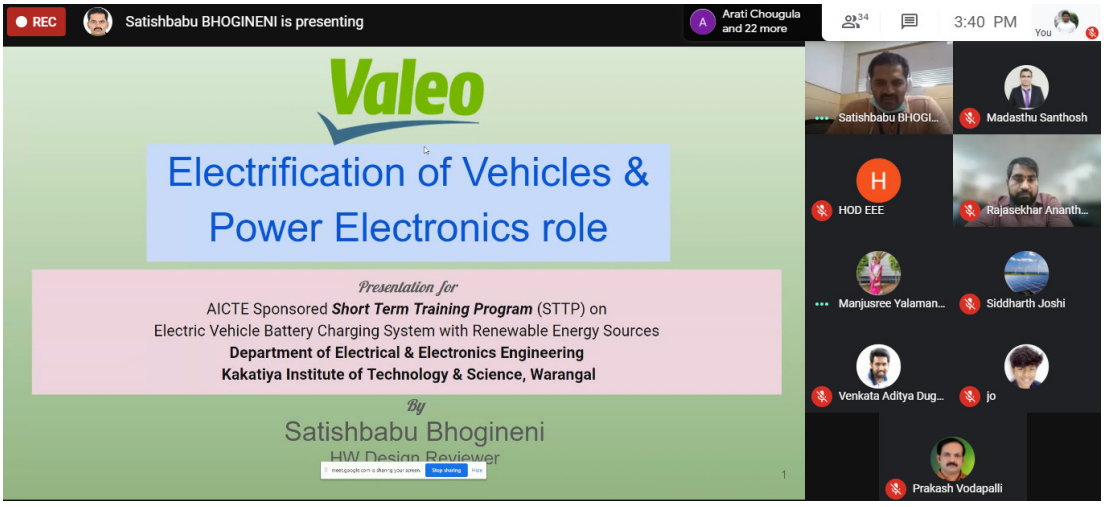
Hardware design Engineer,
Valeo, India.

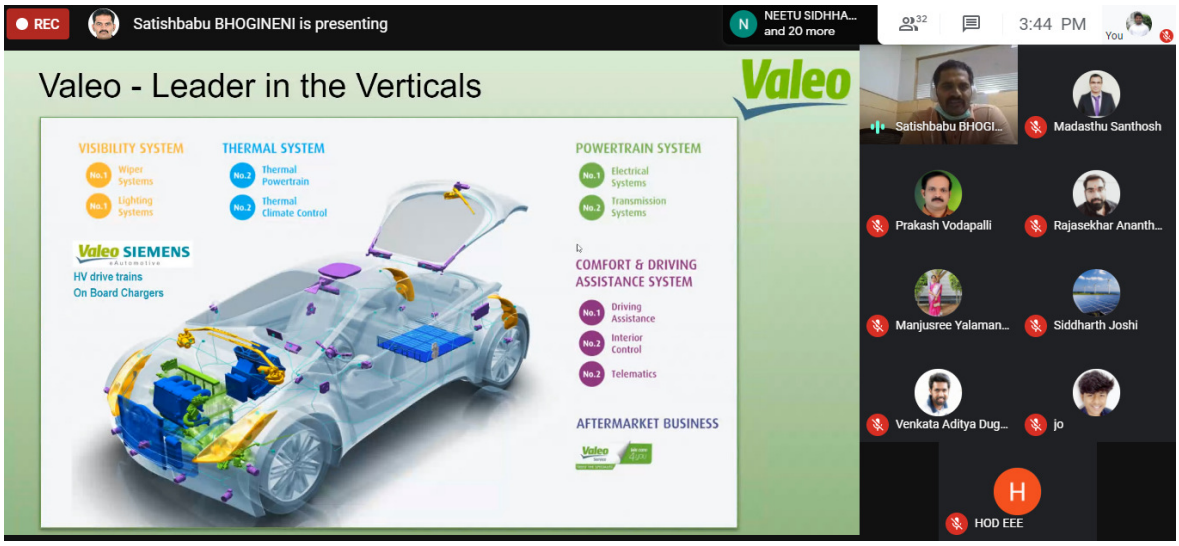
Biography:

Satishbabu Bhogineni received the B.E Degree in Electrical and Electronics engineering from the Vasavi College of Engineering, Hyderabad, M.Tech. and PhD in Electrical engineering from IIT Delhi. He has over 12 years of industrial experience and teaching experience. He was worked with ST Microelectronics, Global Motortech (IIT incubation)., GE global research, GE renewables and also Vignan University, as Asst. Professor. He has 5 US patents on wireless power transfer. Currently he is working with Valeo India as Hardware design reviewer. His research interests include Power Electronics, Drives and electromagnetics, Wireless power transfer, Electric Vehicles.

Report: Important points covered by Dr. B. Sathish babu

- Valeo India back ground, scope, research and development.
- Future mobility trends such as autonomous, connectivity, smart and shared mobility.
- History of electric vehicle and electrification back ground.
- Simplification, comfort, safety, fuel efficiency consideration for design of EV.
- Electrification factors.
- Electrification hybridization parameters.
- Key components of EV such as battery, motor, power electronic modules and software.
- Power electronic modules in an EV.
- Electronics in an Electric vehicle.
- Challenges to power electronic engineers while designing electric vehicles.




REC
Satishbabu BHOGINENI is presenting
NEETU SIDHHA... and 20 more
3:44 PM
You
Valeo - Leader in the Verticals
Valeo
VISIBILITY SYSTEM
No.1 Wiper Systems
No.1 Lighting Systems
THERMAL SYSTEM
No.2 Thermal Powertrain
No.2 Thermal Climate Control
POWERTRAIN SYSTEM
No.1 Electrical Systems
No.2 Transmission Systems
Valeo SIEMENS eAutomotive
HV drive trains
On Board Chargers
COMFORT & DRIVING ASSISTANCE SYSTEM
No.1 Driving Assistance
No.2 Interior Control
No.2 Telematics
AFTERMARKET BUSINESS
Satishbabu BHOGI...
Madasthu Santhosh
Prakash Vodapalli
Rajasekhar Ananth...
Manjusree Yalaman...
Siddharth Joshi
Venkata Aditya Dug...
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REC
Satishbabu BHOGINENI is presenting
Arpana Korshap... and 21 more
3:47 PM
You
Future mobility - Trends
Valeo
electrified
The transition to emissions-free individual mobility would hardly be possible without the electrification of the drive train. First, there is the issue of local components – the fact that cars now only emit very low levels of harmful substances, dust and noise. It also seems that going "emissions-free" will be a global initiative: The idea is that the electricity used to charge the vehicles will come from renewable sources to ensure CO_2-neutral mobility.
autonomous
The rapid progress made in areas such as artificial intelligence, machine learning and deep neural networks make it possible to achieve what until recently seemed utopian – namely the development of autonomous vehicles, which require no human intervention even in complex traffic situations. This will completely redefine the use of individual mobility platforms. New application scenarios are emerging that would have been unthinkable just a few years ago.
shared
For several years, many big cities have offered car-sharing facilities. While these are currently often run as pilot projects or citizen initiatives, sharing concepts will become economically viable with the introduction of autonomous vehicles. It will no longer be necessary to search for a shared vehicle in the surrounding area: instead it will be possible to order vehicles to wherever the user happens to be via a convenient "on demand" service.
connected
The fourth "easy" dimension is the networking of cars with the outside world – summarised by the concept of the Connected Car. This term actually represents two concepts at once. On the one hand, it applies to Car2Car and Car2X communication, which is the networking of the car with other cars or with the transport infrastructure (such as traffic lights). On the other hand, the term also covers the networking of vehicle occupants with the outside world. In future, they will be able to communicate, work, surf the internet or access multi-media services during the journey.
Source: easy – Five trends transforming the Automotive Industry - PWC report
Satishbabu BHOGI...
Madasthu Santhosh
Prakash Vodapalli
Rajasekhar Ananth...
Manjusree Yalaman...
Siddharth Joshi
Venkata Aditya Dug...
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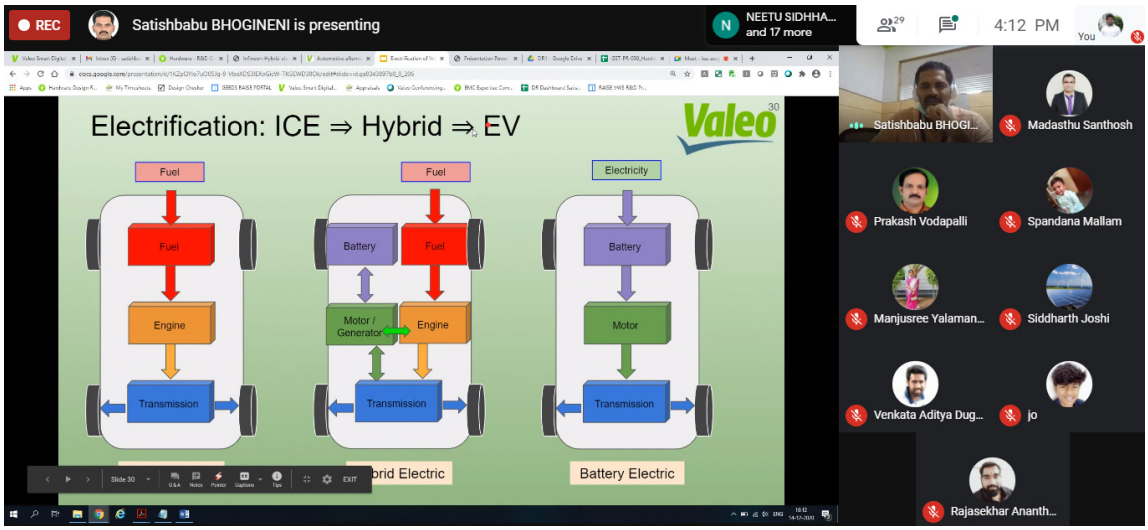
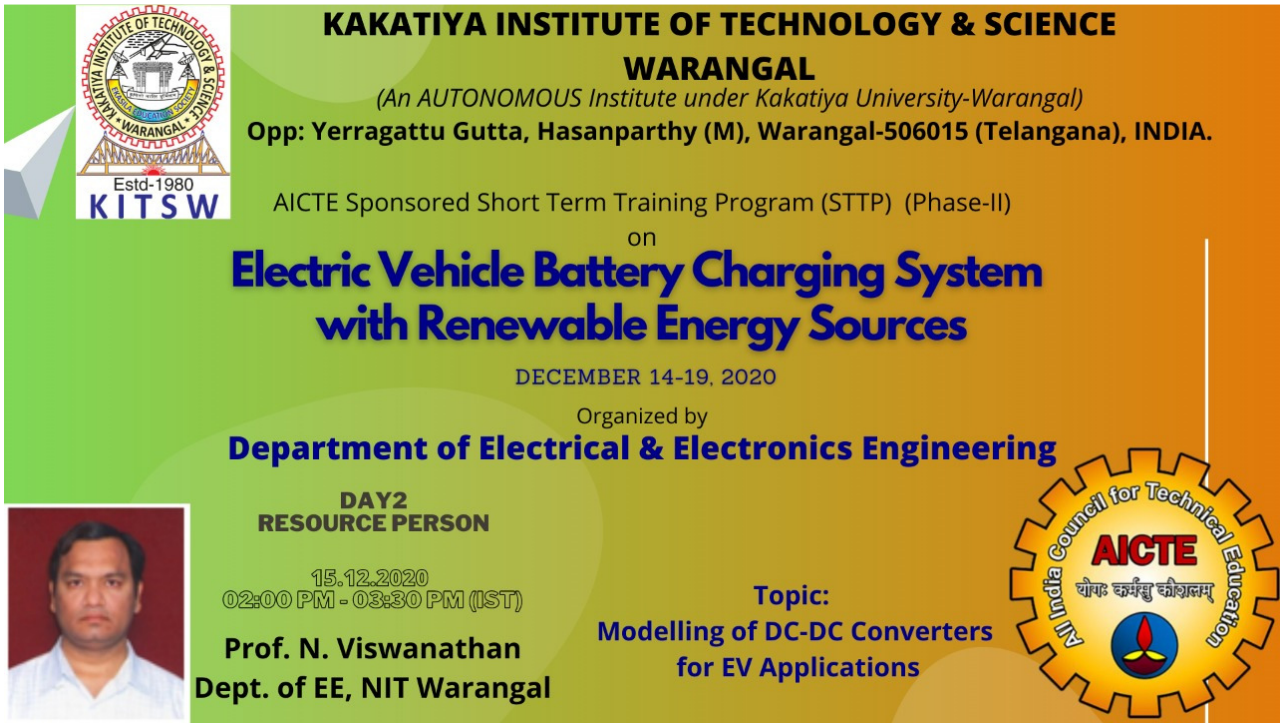

REC
Satishbabu BHOGINENI is presenting
NEETU SIDHHA... and 17 more
4:12 PM
You
Electrification: ICE ⇒ Hybrid ⇒ EV
Valeo
30
Fuel
Engine
Transmission
Fuel
Battery
Motor / Generator
Engine
Transmission
Electricity
Battery
Motor
Transmission
Battery Electric
Satishbabu BHOGI...
Madasthu Santhosh
Prakash Vodapalli
Spandana Mallam
Manjusree Yalaman...
Siddharth Joshi
Venkata Aditya Dug...
jo
Rajasekhar Ananth...

Session III (15th December 2020)

TITLE: Modelling of DC-DC converters for Electric Vehicle applications



Resource Person:

Prof. N. Viswanathan,
Professor, Department of Electrical Engineering,
NIT Warangal.

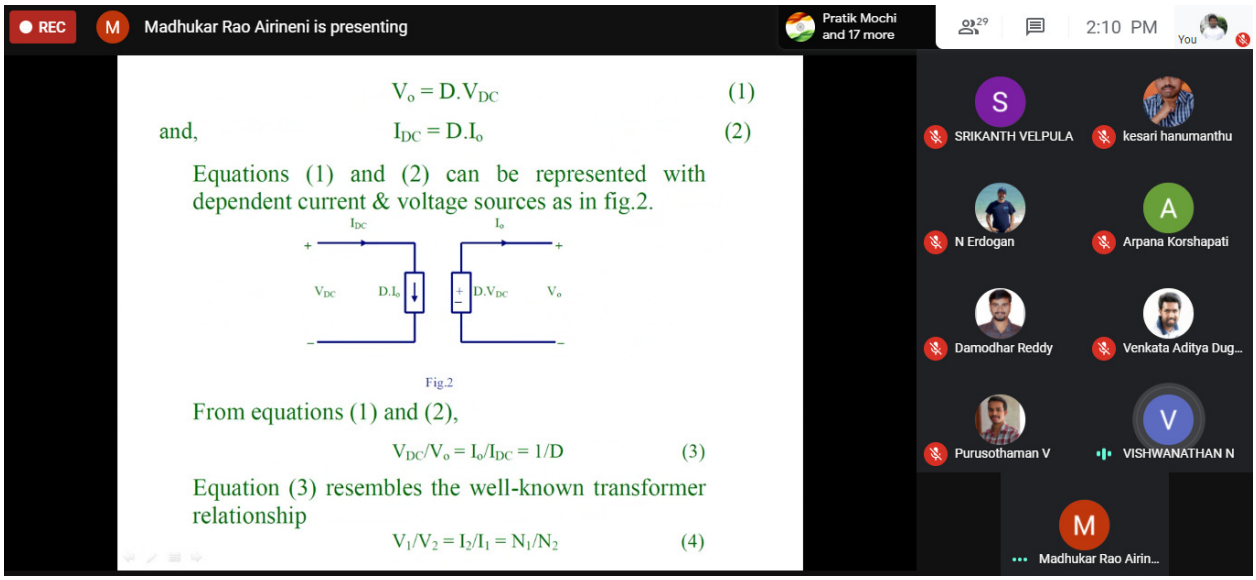
Biography:

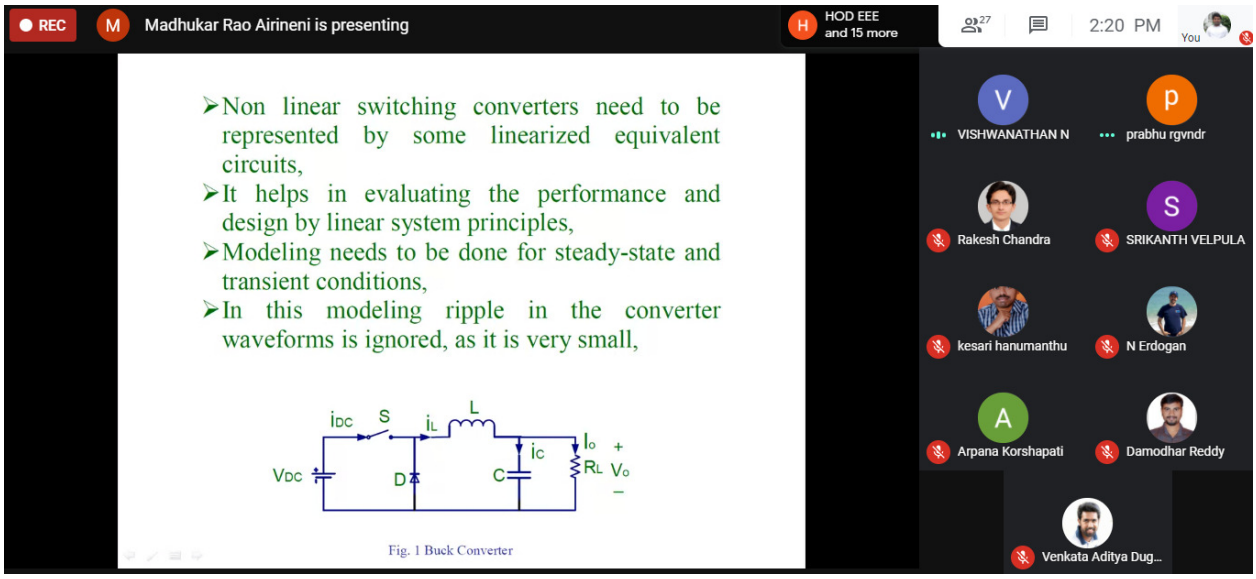
He is currently working as a professor in the Department of Electrical Engineering, NIT Warangal. His interested research areas are Switched Mode Power Supplies, Induction Heating Applications and Electrical Drives. He has 15 Journal publications, 10 conference proceedings and he is also filled 2 patents. He completed 2 projects and two more are under progress. He supervised 4 Ph. D scholar and two more scholars are currently working under his supervision.

Report: Important points covered by Prof. N. Viswanathan

- Introduction on Modeling of DC-DC converters.
- Steady state and small signal modeling Buck converter.
- Steady state and small signal modeling of Boost converter.
- Ideal and practical buck converter modeling under steady state.
- Ideal and practical boost converter modeling under steady state.

- Small signal modeling of DC-DC converters.
- Application of DC-DC converters for EV applications.





REC | Madhukar Rao Airineni is presenting | Sunil Kumar Gu... and 14 more | 2:33 PM

PRACTICAL BUCK CONVERTER MODELING UNDER STEADY-STATE

It includes parasitic resistance of the inductor (r_l), on-state resistance of the switch (r_{on}), on-state diode drop (V_D), and on-state diode resistance (r_d).

For on-state of the switch, the equivalent circuit is given in fig. 4.

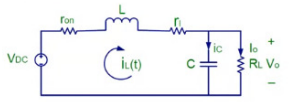


Fig. 4 Equivalent circuit during on-state of switch

Voltage across the inductor $v_L(t)$ and current through the capacitor $i_C(t)$ are expressed as:

$$v_L(t) = [V_{DC} - (r_{on} + r_l).i_L(t) - V_o] \quad (5)$$

$$i_C(t) = [i_L(t) - V_o/R_L] \quad (6)$$

VISHWANATHAN N | Madhukar Rao Airin... | Rakesh Chandra | Damodhar Reddy | Venkata Aditya Dug... | kesari hanumanthu | N Erdogan | Arpana Korshapati | Madhukar Rao Airin...

REC | Madhukar Rao Airineni is presenting | Sai Prasanna Dh... and 18 more | 2:48 PM

In the above figure, the dependent current source and dependent voltage source can be replaced by a DC – DC transformer with turns ratio of 1:D as in the fig. 9.

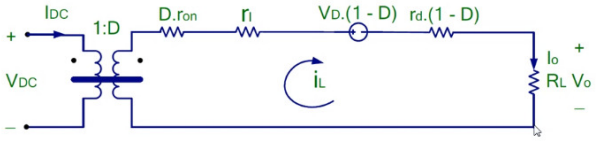


Fig. 9 Equivalent circuit for steady-state operation of buck converter with transformer

If required, just like in a transformer, the elements can be referred to either side of the transformer and calculations can be done.

VISHWANATHAN N | Madhukar Rao Airin... | Rakesh Chandra | Damodhar Reddy | Venkata Aditya Dug... | kesari hanumanthu | N Erdogan | Arpana Korshapati | Madhukar Rao Airin...

REC | Madhukar Rao Airineni is presenting | Swathi Karike and 16 more | 3:12 PM

DC-DC Buck Converter Modeling

It involves perturbation and linearization of the converter equations. Averaged equations for the buck converter are as under:

$$\overline{v_L(t)} = L\overline{di_L(t)/dt} = d(t).[\overline{v_{DC}(t)} - \overline{v_o(t)}] + (1 - d(t)).[-\overline{v_o(t)}] \quad (19)$$

$$\overline{i_C(t)} = C\overline{dv_o(t)/dt} = d(t).[\overline{i_L(t)} - I_o] + (1 - d(t)).[\overline{i_L(t)} - I_o] \quad (20)$$

$$\overline{i_{DC}(t)} = d(t).\overline{i_L(t)} \quad (21)$$

Equations (19),(20), and (21) can be re-written after simplification as follows.

$$L\overline{di_L(t)/dt} = [d(t).\overline{v_{DC}(t)} - \overline{v_o(t)})] \quad (22)$$

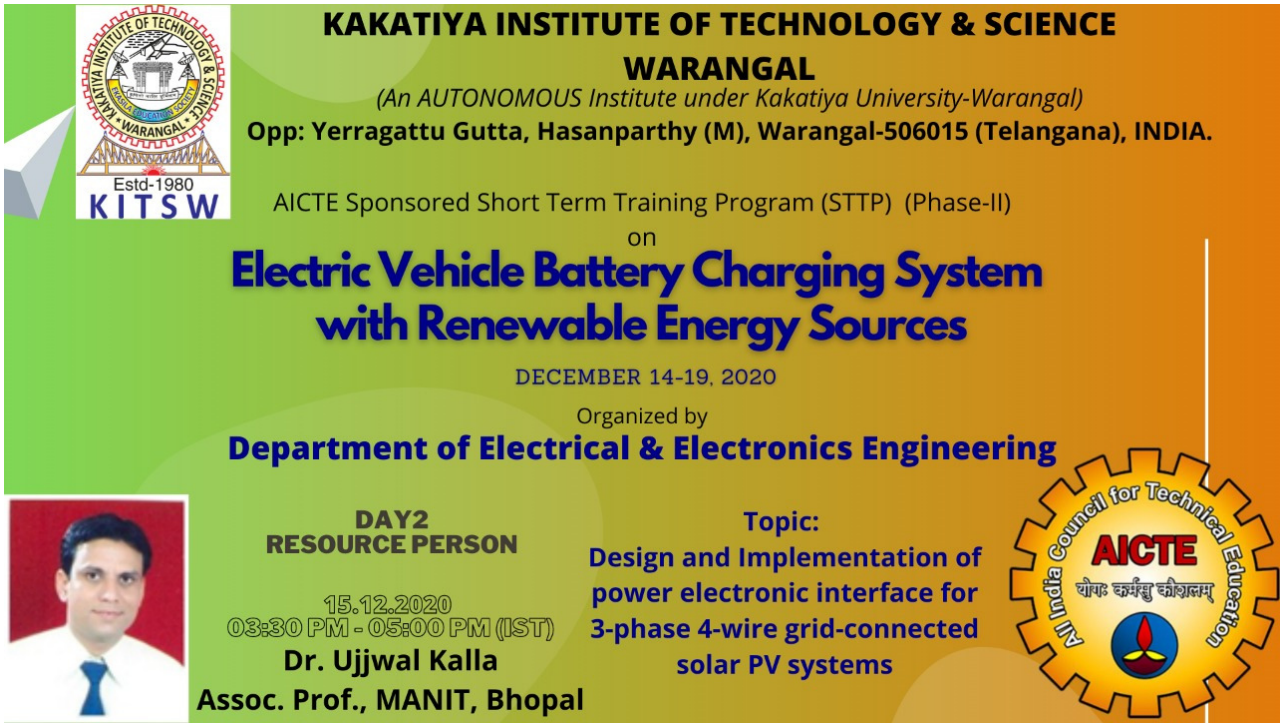
$$C\overline{dv_o(t)/dt} = [\overline{i_L(t)} - \overline{v_o(t)}/R_L] \quad (23)$$

$$\overline{i_{DC}(t)} = d(t).\overline{i_L(t)} \quad (24)$$

VISHWANATHAN N | Madhukar Rao Airin... | Rakesh Chandra | Damodhar Reddy | Venkata Aditya Dug... | kesari hanumanthu | N Erdogan | Arpana Korshapati | Madhukar Rao Airin...

Session IV (15th December 2020)

TITLE: Design and Implementation of power electronic interface for 3-phase 4-wire grid connected solar PV systems



Resource Person:

Dr. Ujjwal Kalla,

Associate Professor, EE Department
MANIT Bhopal.

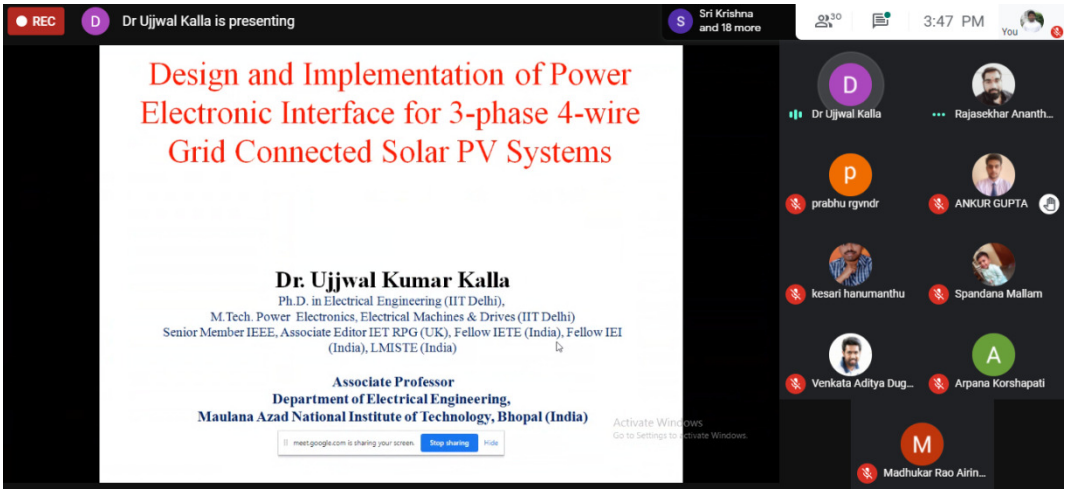
Biography:

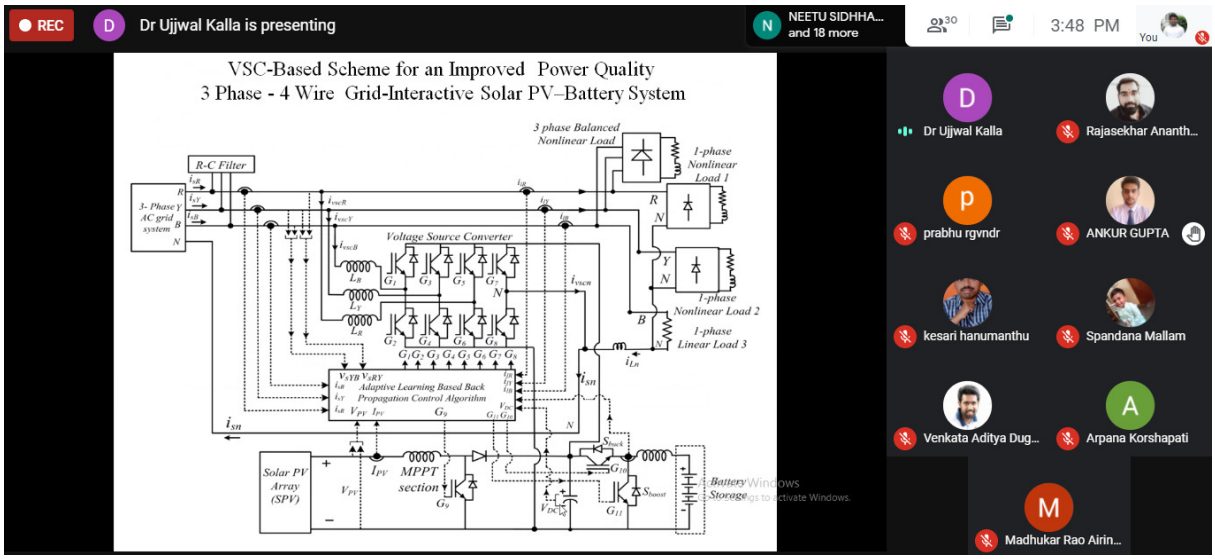
Dr. Ujjwal Kumar Kalla completed his M. Tech and Ph. D from IIT Delhi. Currently he is working as an Associate Professor in the Department of Electrical Engineering, Maulana Azad National Institute of Technology, Bhopal (India). He is a Former Project Director, (April 2015 to February 2020) Ceramic Electrical Research Development Center, Bikaner (Rajasthan) India (An Autonomous Organization of Govt. of Rajasthan) An N.A.B.L., Govt. of India, Accredited organization & Former Head, Department of Electrical Engineering, Govt. Engineering College Bikaner, (Rajasthan), India. He is an Associate Editor of IET RPG, Fellow IETE (India), Fellow IEI (India), Senior Member IEEE and He is also having a Total Teaching Experience of 18 Years

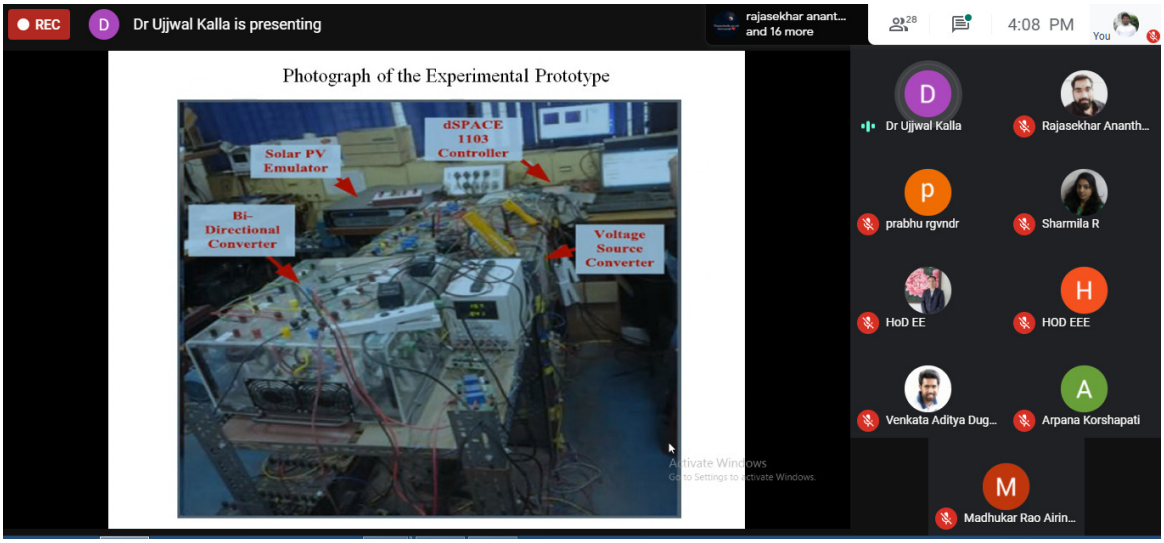
He received National Award for Best M. Tech. Thesis of I.S.T.E. in Electrical and Electronics Engineering 2010". (All India First Prize) (cash award Rupees 10,000 and a certificate of Appreciation). POSOCO Power System Award (in Doctoral Category) from FITT, IITD & POSOCO. (Cash award Rupees 60,000 and a certificate of Appreciation). GRIDTECH 2015 award of Power Grid and Ministry of Power (All India First Prize) in During PhD. He filled 4 Patents Filled, guided 35 M. Tech and 1 research scholar.

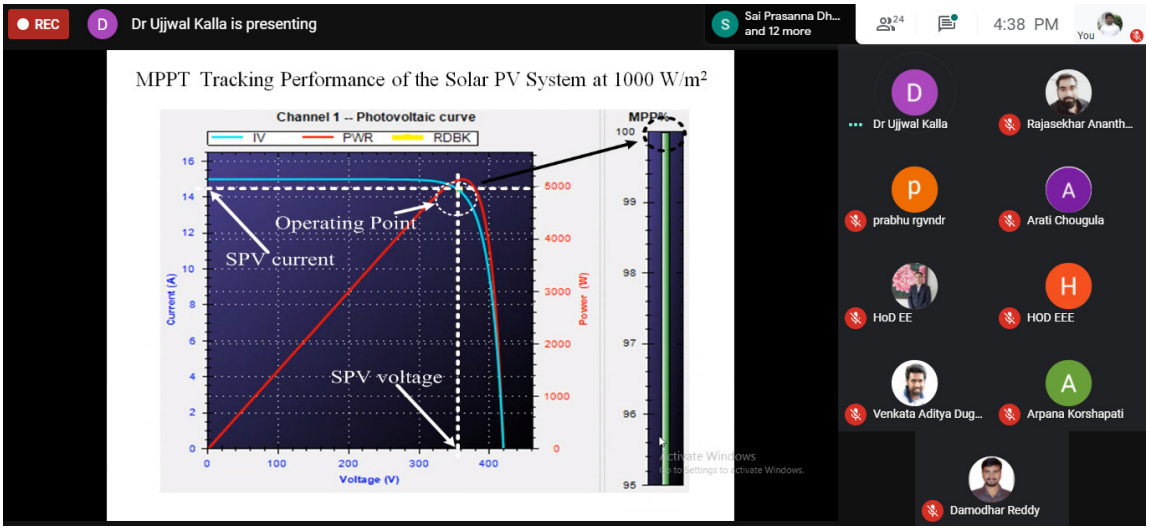
Report: Important points covered by Dr. Ujjwal Kalla,

- Schematic diagram of VSC based grid interactive solar PV batter system for power quality improvement and active power injection.
- Various components of grid connected system.
- Block diagram of the proposed control algorithm.
- Simulation results during
  - Compensation of non-linear and unbalanced load current.
  - Neutral current compensation.
  - Distribution of power generated by solar between load and grid.
  - Steady state behavior of system at significantly unbalanced loads.
- Development of experimental prototype of GCI.
- Experimental results during
  - Compensation of non-linear and unbalanced load current and neutral current compensation.
  - Steady state behavior at critically unbalanced load.
  - Dynamic behavior under sudden removal of load.
  - System behavior under variation in insolation level.



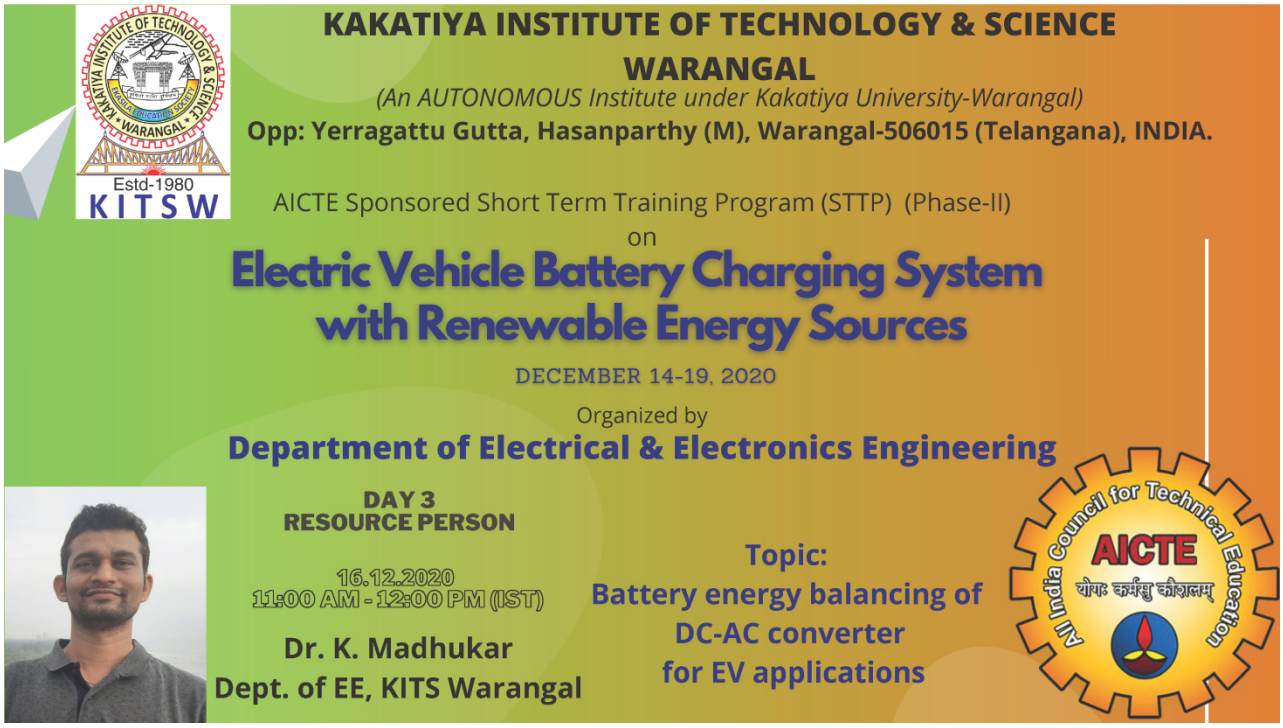

REC
Dr Ujjwal Kalla is presenting
NEETU SIDHHA... and 18 more
3:48 PM
You
VSC-Based Scheme for an Improved Power Quality
3 Phase - 4 Wire Grid-Interactive Solar PV–Battery System
3 phase Balanced Nonlinear Load
1-phase Nonlinear Load 1
1-phase Nonlinear Load 2
1-phase Linear Load 3
R-C Filter
3- Phase y AC grid system
Voltage Source Converter
Adaptive Learning Based Back Propagation Control Algorithm
Solar PV Array (SPV)
MPPT section
Battery Storage
Dr Ujjwal Kalla
Rajasekhar Ananth...
prabhu rgvndr
ANKUR GUPTA
kesari hanumanthu
Spandana Mallam
Venkata Aditya Dug...
Arpana Korshapati
Madhukar Rao Airin...


REC
Dr Ujjwal Kalla is presenting
rajasekhar anant... and 16 more
4:08 PM
You
Photograph of the Experimental Prototype
Solar PV Emulator
dSPACE 1103 Controller
Bi-Directional Converter
Voltage Source Converter
Dr Ujjwal Kalla
Rajasekhar Ananth...
prabhu rgvndr
Sharmila R
HoD EE
HOD EEE
Venkata Aditya Dug...
Arpana Korshapati
Madhukar Rao Airin...


REC
Dr Ujjwal Kalla is presenting
Sai Prasanna Dh... and 12 more
4:38 PM
You
MPPT Tracking Performance of the Solar PV System at 1000 W/m²
Channel 1 -- Photovoltaic curve
IV
PWR
RDBK
MPP
Operating Point
SPV current
SPV voltage
Current (A)
Power (W)
Voltage (V)
Dr Ujjwal Kalla
Rajasekhar Ananth...
prabhu rgvndr
Arati Chougula
HoD EE
HOD EEE
Venkata Aditya Dug...
Arpana Korshapati
Damodhar Reddy

Session V (16th December 2020)

TITLE: Battery energy balancing of DC-AC converter for EV applications



Resource Person:

Dr. K Madhukar,
Assistant Professor, EEE Department
KITS Warangal

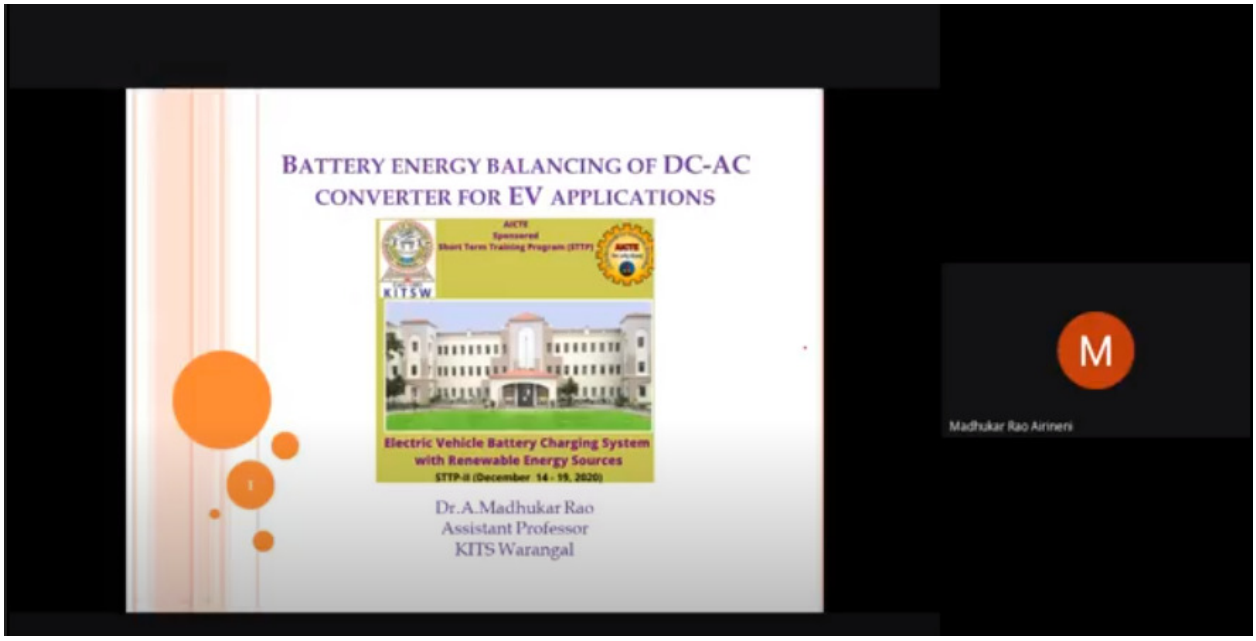
Biography:

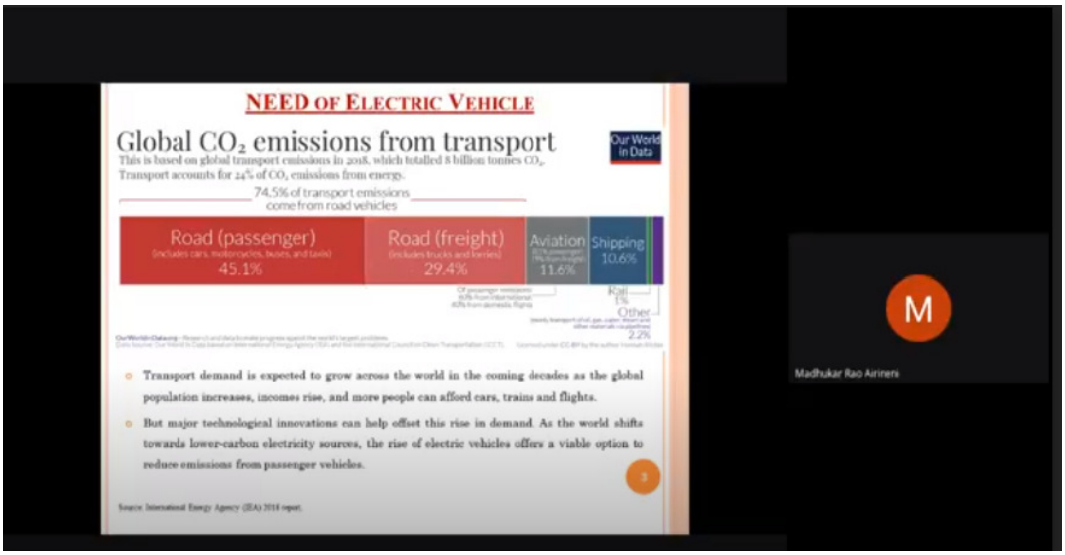
Dr. A. Madhukar Rao received the B.Tech Degree in electrical and electronics engineering from Vaagdevi College of engineering Warangal, and the M.Tech Degree in power electronics from JNTU College of engineering, Hyderabad, in 2008 and 2011, respectively. Ph.D. degree from Indian Institute of Technology Hyderabad in 2017. He has 3 international journals and 15 IEEE international and national conferences. He is a reviewer of Industrial electronics society, IET power electronics and Institution of engineer's series B journal and some of the IEEE conferences. He has received Best Research Scholar of the year award in engineering and technology by Telangana state council of science and technology (Telangana Govt.) and Institution of Engineers on engineers day i.e., on 15th September 2017. His research interests

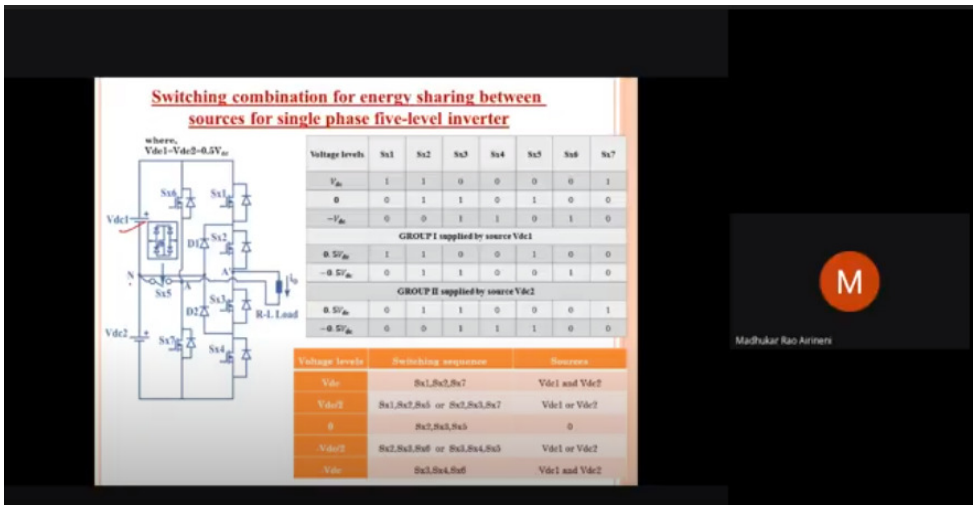
include fault-tolerant multilevel inverters and pulse width modulation techniques, renewable energy sources, wireless charging of EV's. He is currently working as assistant professor in electrical engineering department at KITS Warangal.

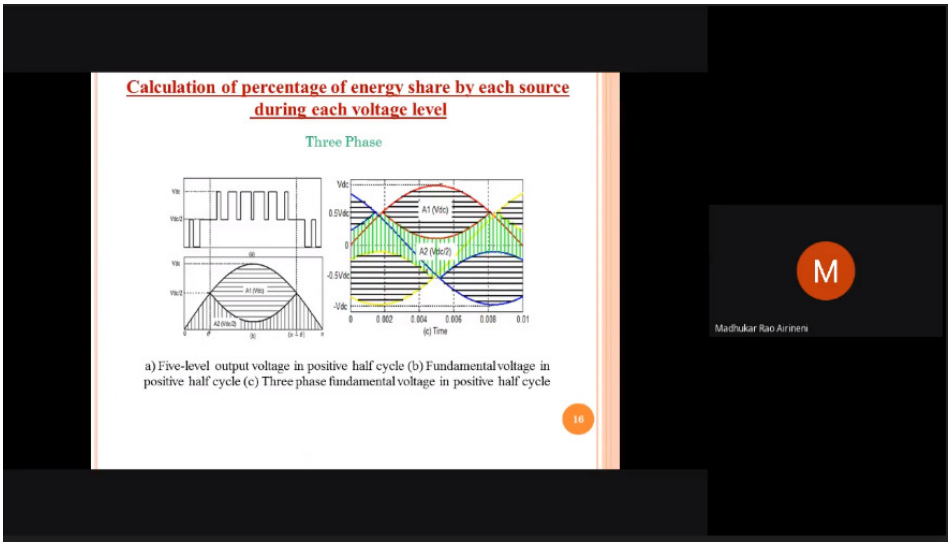
Report: Important points covered by Dr. K Madhukar

- Integration of EV with renewable energy sources.
- Importance of multi level inverters for EV applications.
- Conventional three level and five level inverter topologies.
- Energy balancing and minimization of DC voltage offset of a five level inverter.
- Calculation of percentage of energy share by each source during each voltage level.
- Energy balancing equations for a five level inverter.
- Control flowchart for selection of switching combination.



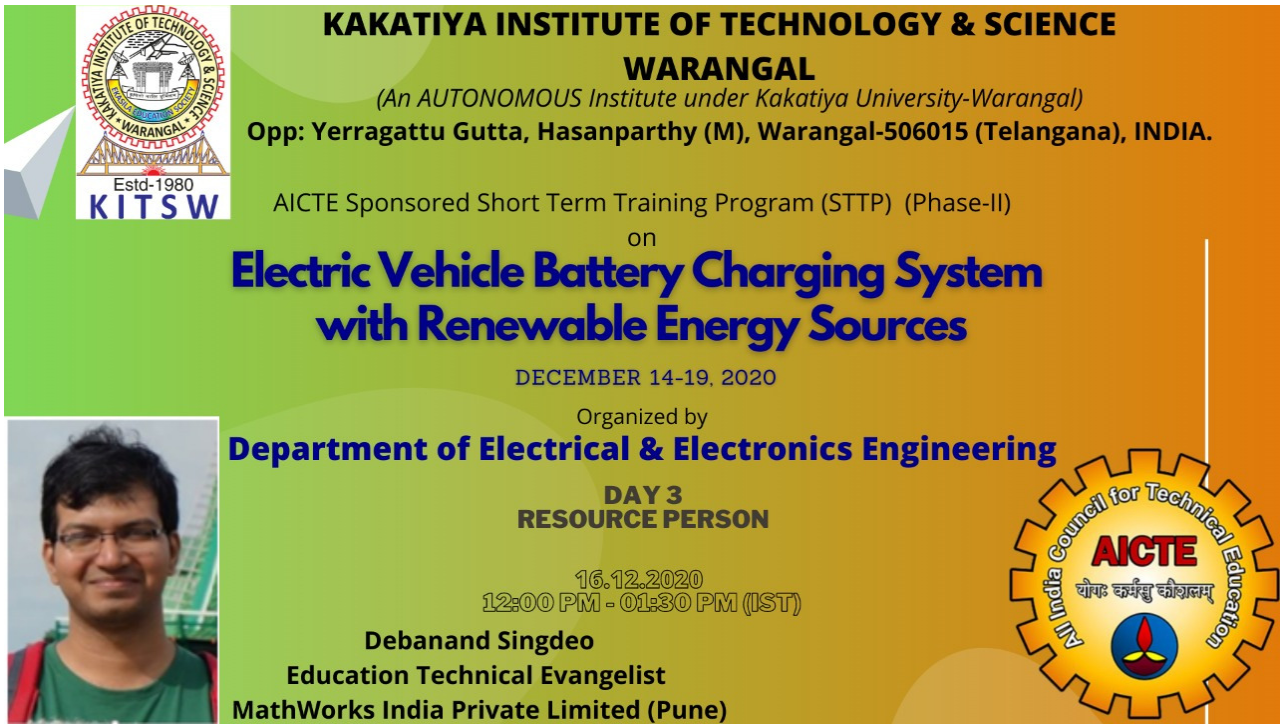

NEED OF ELECTRIC VEHICLE
Global CO_2 emissions from transport
Our World in Data
This is based on global transport emissions in 2018, which totalled 8 billion tonnes CO_2.
Transport accounts for 24% of CO_2 emissions from energy.
74.5% of transport emissions come from road vehicles
Road (passenger) 45.1%
Road (freight) 29.4%
Aviation 11.6%
Shipping 10.6%
Rail 1%
Other 2.2%
Transport demand is expected to grow across the world in the coming decades as the global population increases, incomes rise, and more people can afford cars, trains and flights.
But major technological innovations can help offset this rise in demand. As the world shifts towards lower-carbon electricity sources, the rise of electric vehicles offers a viable option to reduce emissions from passenger vehicles.
Source: International Energy Agency (IEA) 2018 report.
M
Madhukar Rao Airineni


Switching combination for energy sharing between sources for single phase five-level inverter
where, Vdc1=Vdc2=0.5V_{dc}
Vdc1
Vdc2
Sx1
Sx2
Sx3
Sx4
Sx5
Sx6
Sx7
D1
D2
R-L Load
Voltage levels | Sx1 | Sx2 | Sx3 | Sx4 | Sx5 | Sx6 | Sx7
V_{dc} | 1 | 1 | 0 | 0 | 0 | 0 | 1
0 | 0 | 1 | 1 | 0 | 1 | 0 | 0
$-V_{dc}$ | 0 | 0 | 1 | 1 | 0 | 1 | 0
GROUP I supplied by source Vdc1
0.5V_{dc} | 1 | 1 | 0 | 0 | 1 | 0 | 0
-0.5V_{dc} | 0 | 1 | 1 | 0 | 0 | 1 | 0
GROUP II supplied by source Vdc2
0.5V_{dc} | 0 | 1 | 1 | 0 | 0 | 0 | 1
-0.5V_{dc} | 0 | 0 | 1 | 1 | 1 | 0 | 0
Voltage levels | Switching sequence | Sources
Vdc | Sx1,Sx2,Sx7 | Vdc1 and Vdc2
Vdc/2 | Sx1,Sx2,Sx5 or Sx2,Sx3,Sx7 | Vdc1 or Vdc2
0 | Sx2,Sx3,Sx5 | 0
-Vdc/2 | Sx2,Sx3,Sx6 or Sx3,Sx4,Sx5 | Vdc1 or Vdc2
-Vdc | Sx3,Sx4,Sx6 | Vdc1 and Vdc2
M
Madhukar Rao Airineni


Calculation of percentage of energy share by each source during each voltage level
Three Phase
Vdc
0.5Vdc
0
-0.5Vdc
-Vdc
A1 (Vdc)
A2 (Vdc/2)
0 0.002 0.004 0.006 0.008 0.01
(c) Time
a) Five-level output voltage in positive half cycle (b) Fundamental voltage in positive half cycle (c) Three phase fundamental voltage in positive half cycle
16
M
Madhukar Rao Airineni

Session VI (16th December 2020)

TITLE: Modeling of Electric Vehicles using MATLAB - Simulink



Resource Person:

Debanand Singdeo

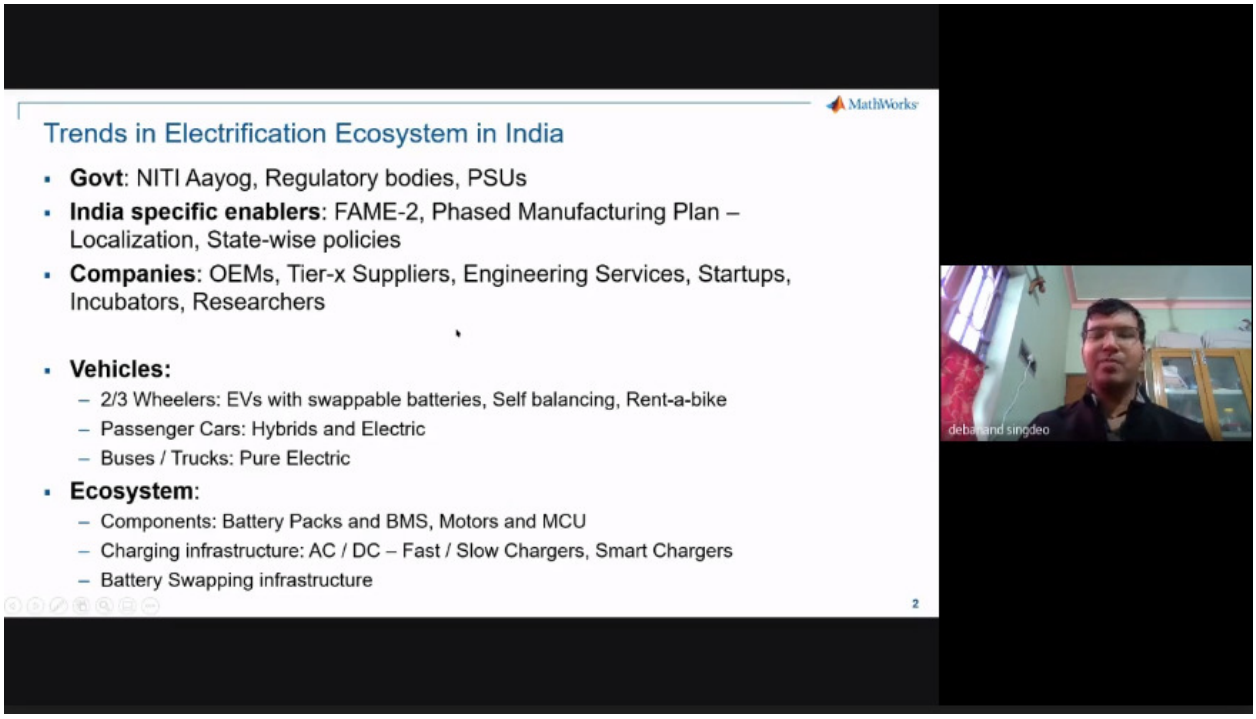
Education Technical Evangelist
Math Works India Private Limited (Pune).

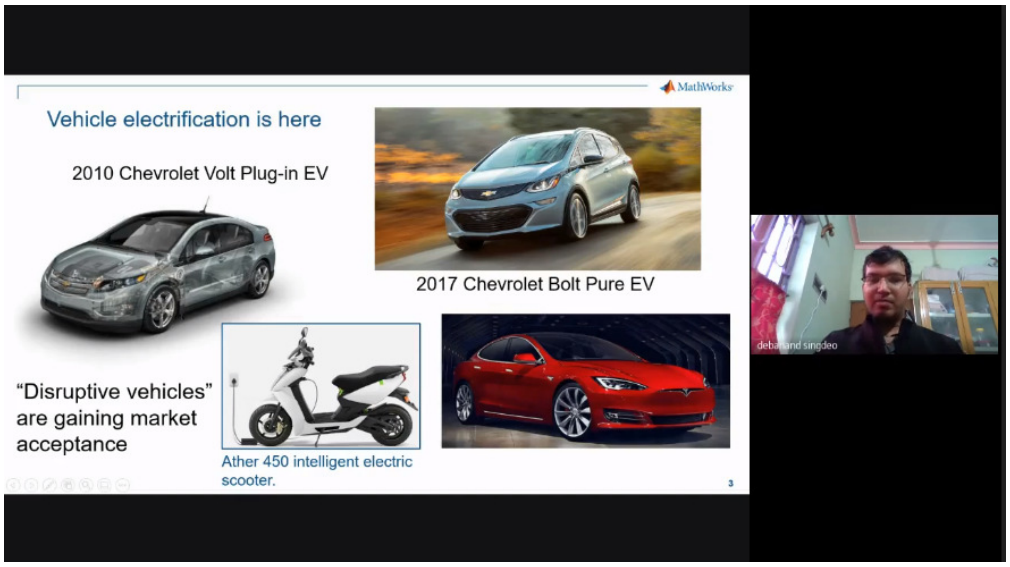
Biography:

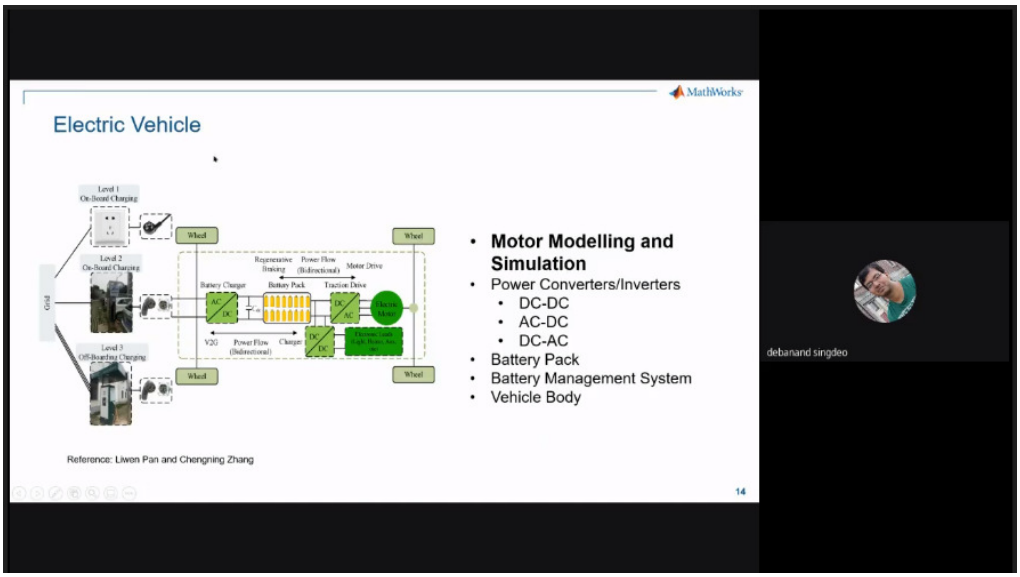
Debanand Singdeo works as an Education Technical Evangelist at Math Works India Private Limited (Pune). In this role, he collaborates with researchers with the aim of accelerating the pace of innovation in science and engineering. Also, he works closely with academic institutions for effective utilization of Math Works resources in education. He has a Bachelor's degree in physics from Visva Bharati, Santiniketan, followed by MSc -PhD degree from the Department of Energy Science and Engineering, IIT Bombay. His prior research experience is in the area of modeling and simulation of renewable energy systems. In previous roles, he has worked as a postdoctoral fellow in the Department of Energy Technology, Aalborg University, Denmark.

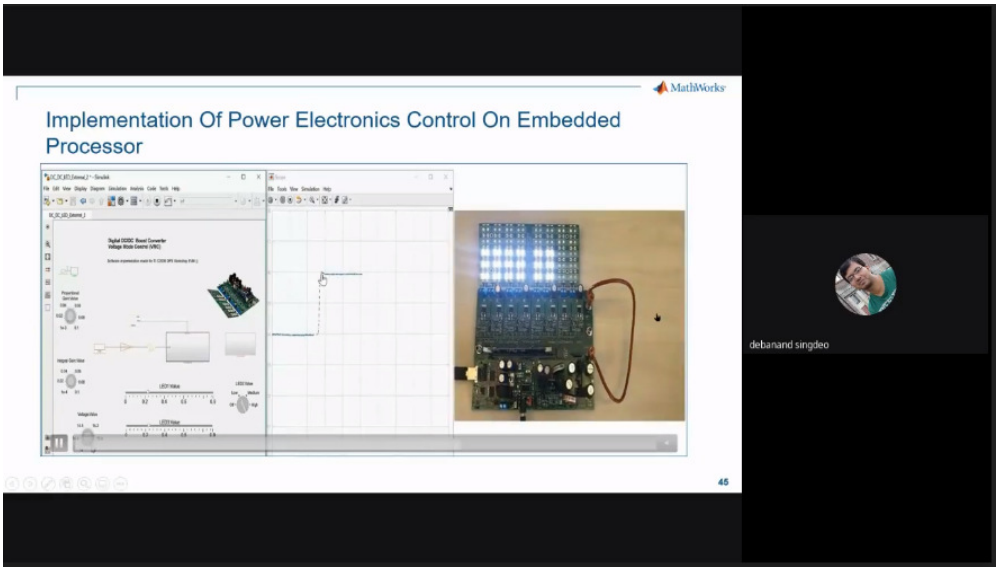
Report: Important points covered by Debanand Singdeo

- Trends in electrification ecosystems in India.
- Using model based design to build the Tesla Roadster.
- How is Tesla winning the range game?
- Challenges for power train electrification.
- Major components of an electric vehicle.
- Different approaches for modeling dynamic systems.
- Modeling a brushless DC motor.
- Block diagram of BLDC speed control.
- Power converter topology for an EV.
- Implementing control for power converters on TI DC-DC led developer kit.
- Why batteries models are important and battery modeling for an EV.
- Performance hardware in-loop testing for BMS electronic control units (ECUs)



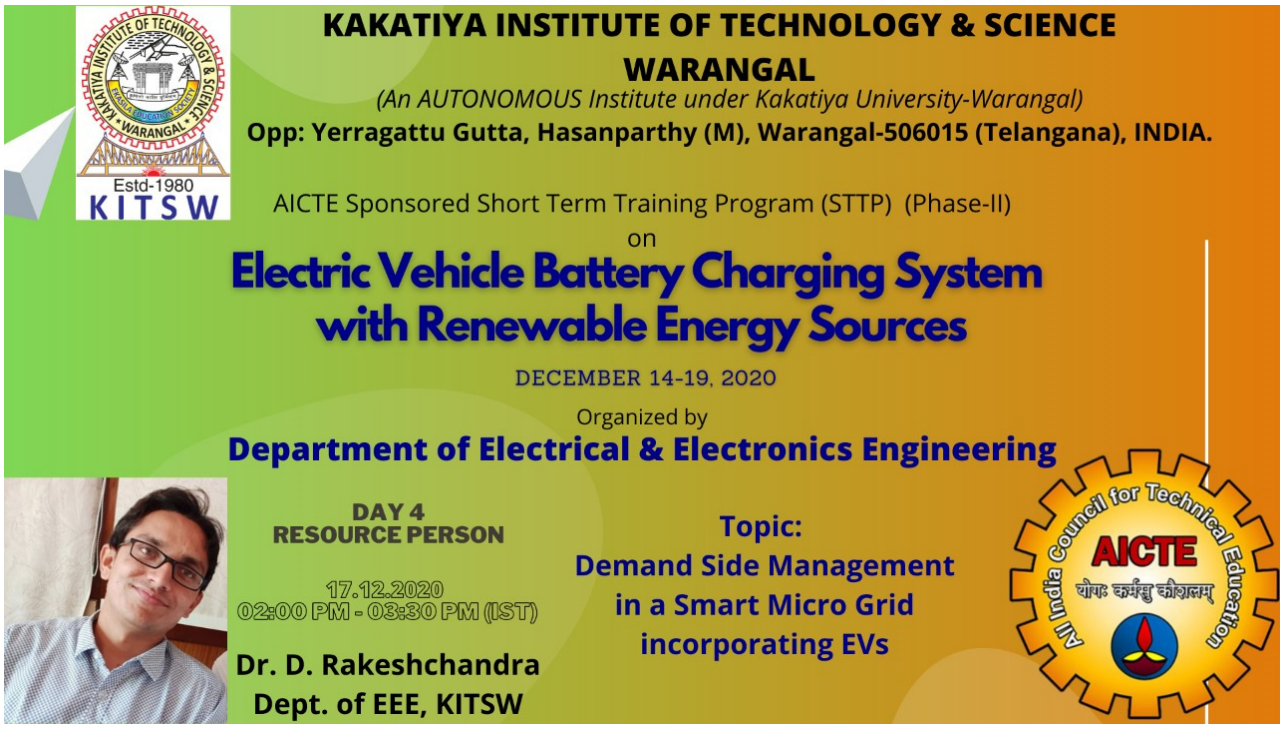

MathWorks
Vehicle electrification is here
2010 Chevrolet Volt Plug-in EV
2017 Chevrolet Bolt Pure EV
"Disruptive vehicles" are gaining market acceptance
Ather 450 intelligent electric scooter.
3
debanand singdeo


MathWorks
Electric Vehicle
Level 1 On-Board Charging
Level 2 On-Board Charging
Level 3 Off-Boarding Charging
Grid
Wheel
Regenerative Braking
Power Flow (Bidirectional)
Motor Drive
Battery Charger
Battery Pack
Traction Drive
V2G
Power Flow (Bidirectional)
Charger
Motor
Motor Modelling and Simulation
Power Converters/Inverters
DC-DC
AC-DC
DC-AC
Battery Pack
Battery Management System
Vehicle Body
Reference: Liwen Pan and Chengning Zhang
14
debanand singdeo


MathWorks
Implementation Of Power Electronics Control On Embedded Processor
45
debanand singdeo

Session VII (17th December 2020)

TITLE: Demand side management in a smart micro grid incorporating electric vehicles



Resource Person:

Dr. D. Rakesh Chandra

Assistant professor, EEE Department
KITS Warangal

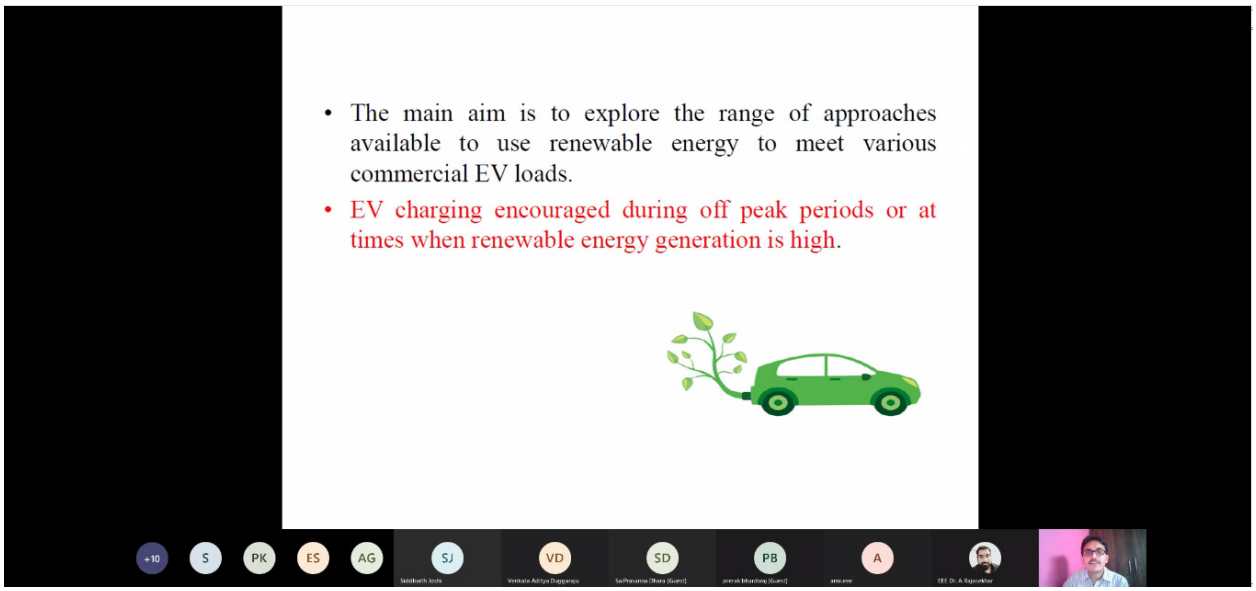
Biography:

Dr. D. Rakesh Chandra completed his B.Tech from VNR Vignana Jyothi College in 2008. He did M.Tech (Power System) from NIT Warangal in 2010. He worked as Assistant Professor in EEED, VITS College, Karimnagar from 2010-11. He did his PhD from NIT Warangal from 2011-2016. During his PhD he got Selected in world prestigious Erasmus International Scholarship in 2013 and with that fellowship he worked towards his Ph. D for one year in Energy laboratory Politecnico Di Milano, Milan, Italy. He received prestigious POSOCO Power System Award (PPSA 2017) for the best Ph. D thesis in February 2017 by Power system Operation Corporation and FITT- IIT Delhi.He is having 10 international publications and authored one text

book. He is also review Editor for Frontiers Journal of Energy. At present he is working as Asst. Professor and R&D Coordinator in the department of EEE, KITS Warangal since 2016.

Report: Important points covered by Dr. D. Rakesh Chandra

- The upcoming reality of smart grid and energy markets.
- Concept of micro grid.
- Comparison between conventional grid and micro grid.
- Smart micro grid.
- Demand side management.
- Concept of wind energy and practical wind turbine.
- Formation of fixed and variable load curves.
- Concept of Genetic algorithms.
- DSM using GA, variable load arrangement, and chromosome arrangement.



Demand Side Management (DSM)

- It is a set of interconnected and flexible processes
- Allows customers in shifting their own demand for electricity during peak time
- Leads to improving the load factor .

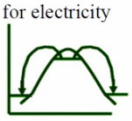


Fig: Load Shifting

- DSM Focuses on
  - utilizing power saving technologies
  - monetary incentives, power tariffs and policies
  - to mitigate the maximum demand instead of expanding the generation capacity.

10

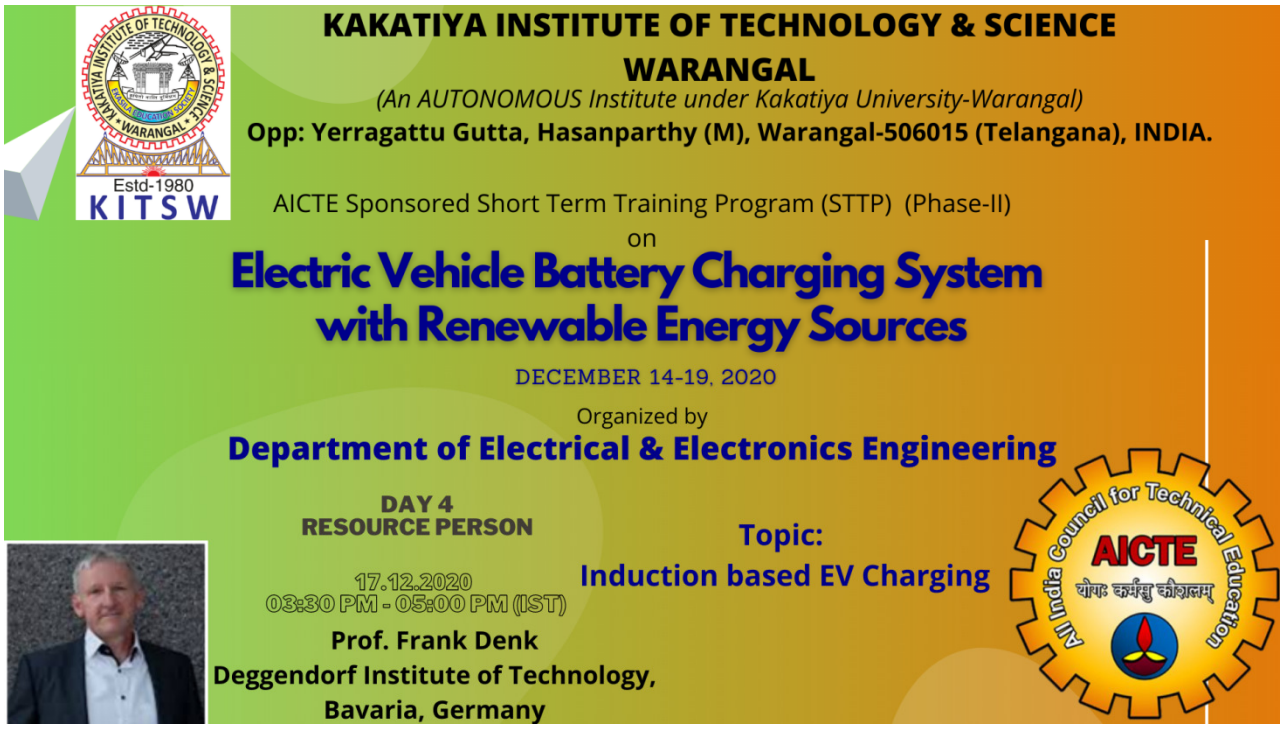
Practical Wind turbine

Genetic Algorithms

- GAs were first invented by John Holland in 1970's to mimic some of the processes observed in natural evolution.
- Evaluation function is the link between GAs with the problem they are asked to solve.
- Natural selection is the link between chromosomes and the performance of their decoded structures.
- The process of reproduction is the point at which evolution takes place.
- Mutation may cause chromosomes of biological children to be different from their biological parents.

Session VIII (17th December 2020)

TITLE: Inductive charging for electric vehicles, norms, standards and interoperability



Resource Person:

Prof. Frank Denk,

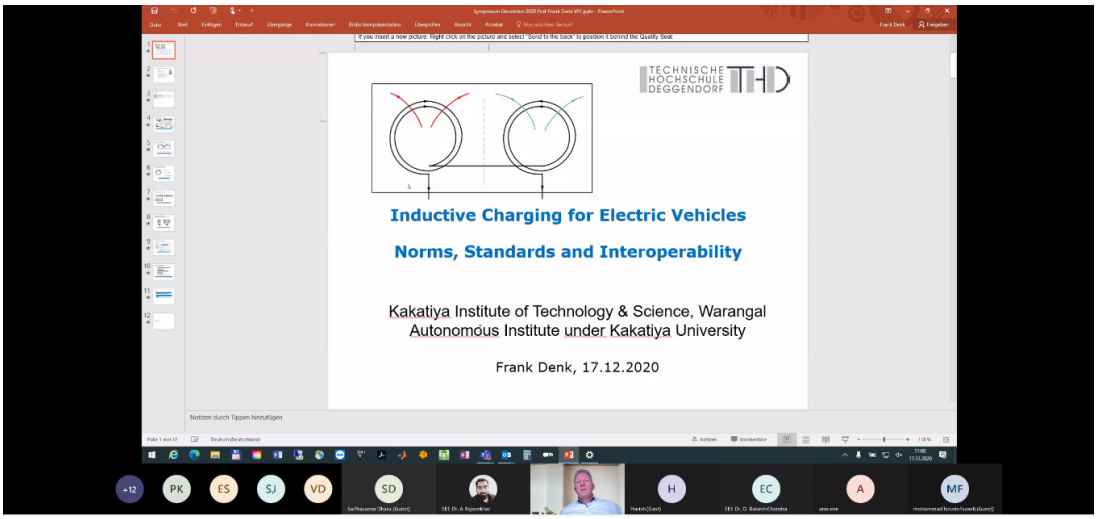
Professor, Deggendorf Institute of Technology,
Bavaria, Germany

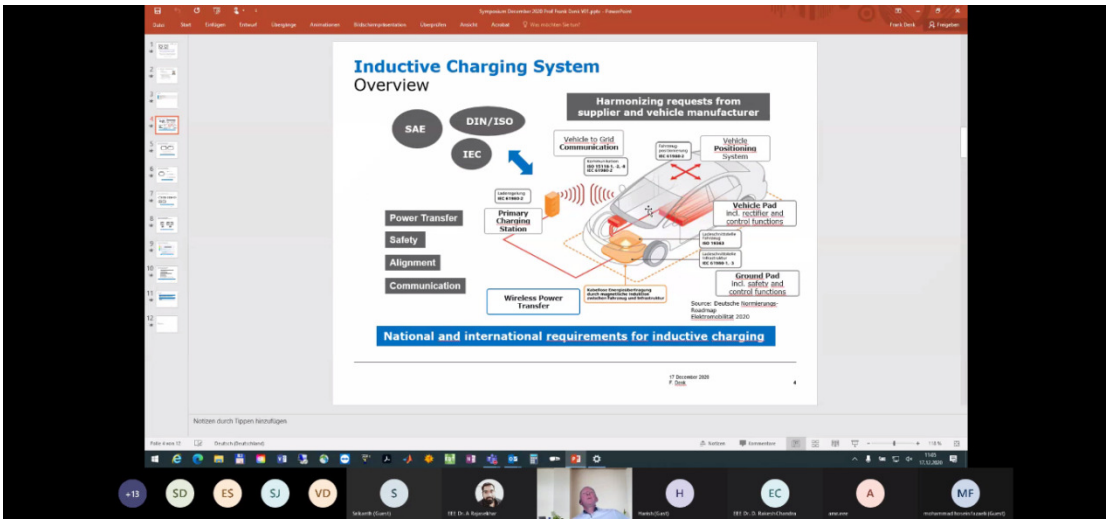
Biography:

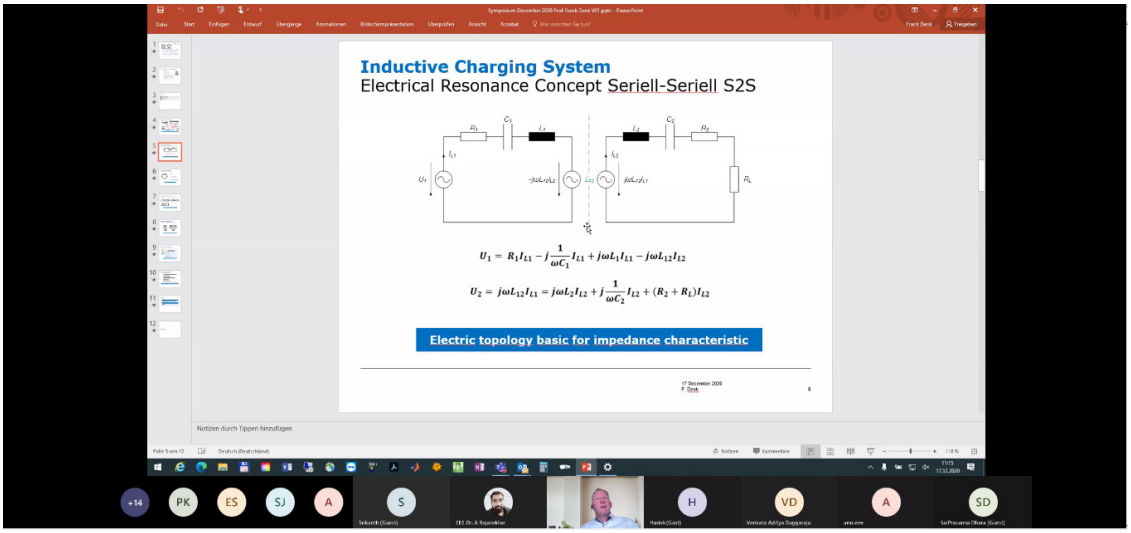
Prof. Frank Denk is currently working as a professor in Deggendorf Institute of Technology, Bavaria, and Germany. His research interests are Simulation of Electromagnetic Fields, Semiconductor Technology, Embedded Automotive Systems, Mechatronics, charging Technologies for E-Mobility, Electronics – Microsystems, Structure and Functions of Cyber Physical Systems, Business Models of Cyber Physical Systems, and Virtual and Augmented Reality.

Report: Important points covered by Prof Frank Denk,

- Concept of electric vehicle.
- Inductive charging for electric vehicle.
- Inductive charging system.
- Primary charging station.
- Vehicle to grid communication and wireless power transfer.
- Electromagnetic terms.
- Electrical resonance.
- Electric topology basic for impedance characteristics.
- Electric resonance concepts such as S2P, P2P, and P2S.
- Magnetic concepts such as Unipolar and bipolar.
- Magnetically circular Unipolar design.
- Main technical requirements of inductive charging system.

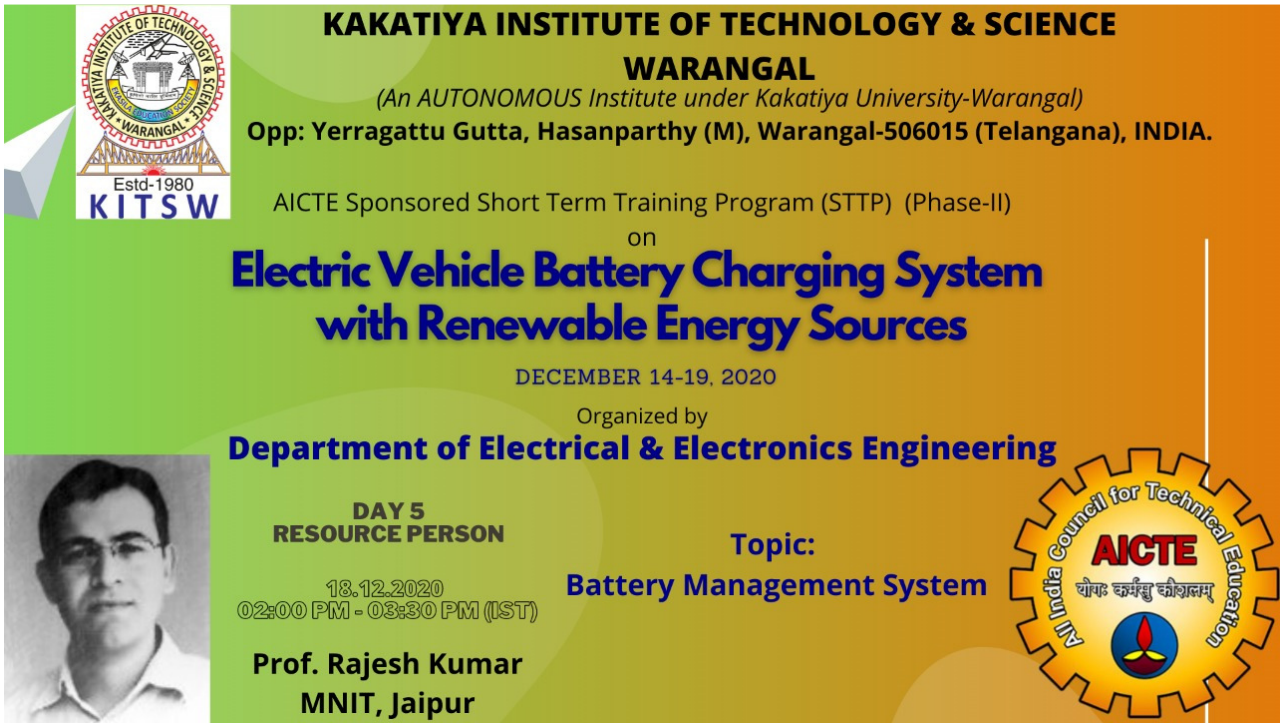

TECHNISCHE HOCHSCHULE DEGGENDORF THD
Inductive Charging for Electric Vehicles
Norms, Standards and Interoperability
Kakatiya Institute of Technology & Science, Warangal
Autonomous Institute under Kakatiya University
Frank Denk, 17.12.2020


Inductive Charging System
Overview
Harmonizing requests from supplier and vehicle manufacturer
SAE
DIN/ISO
IEC
Vehicle to Grid Communication
Vehicle Positioning System
Power Transfer
Safety
Alignment
Communication
Primary Charging Station
Vehicle Pad incl. rectifier and control functions
Ground Pad incl. safety and control functions
Wireless Power Transfer
National and international requirements for inductive charging


Inductive Charging System
Electrical Resonance Concept Seriell-Seriell S2S
$U_1 = R_1 I_{L1} - j\frac{1}{\omega C_1} I_{L1} + j\omega L_1 I_{L1} - j\omega L_{12} I_{L2}$
$U_2 = j\omega L_{12} I_{L1} = j\omega L_2 I_{L2} + j\frac{1}{\omega C_2} I_{L2} + (R_2 + R_L) I_{L2}$
Electric topology basic for impedance characteristic

Session IX (18th December 2020)

TITLE: Battery management system



Resource Person:

Prof Rajesh Kumar,

Professor, EE Department,
MNIT, Jaipur

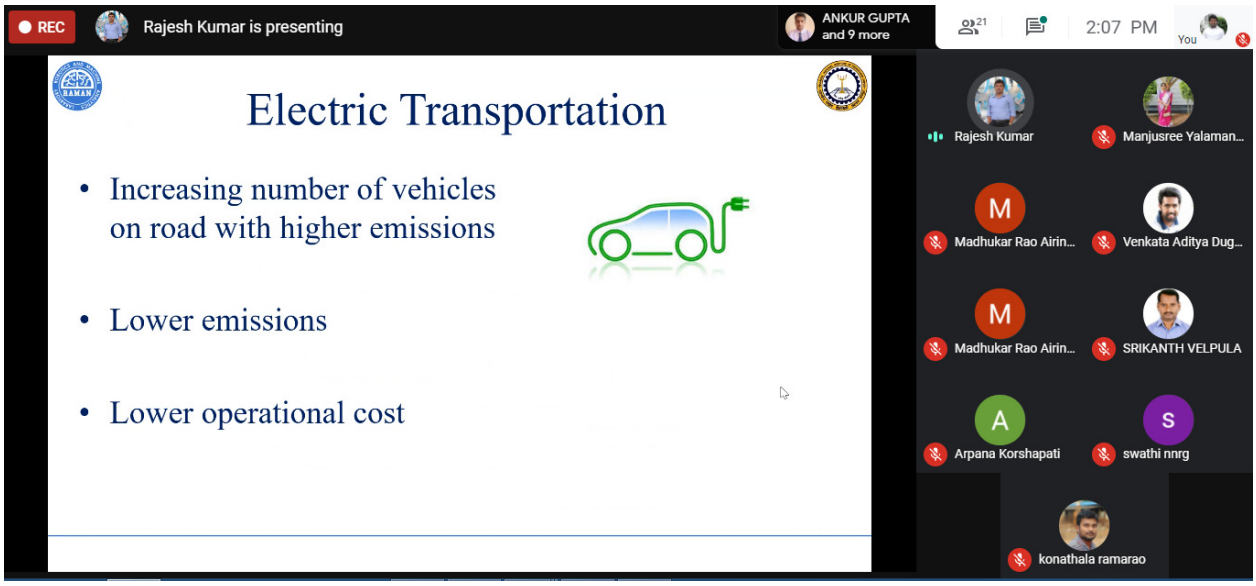
Biography:

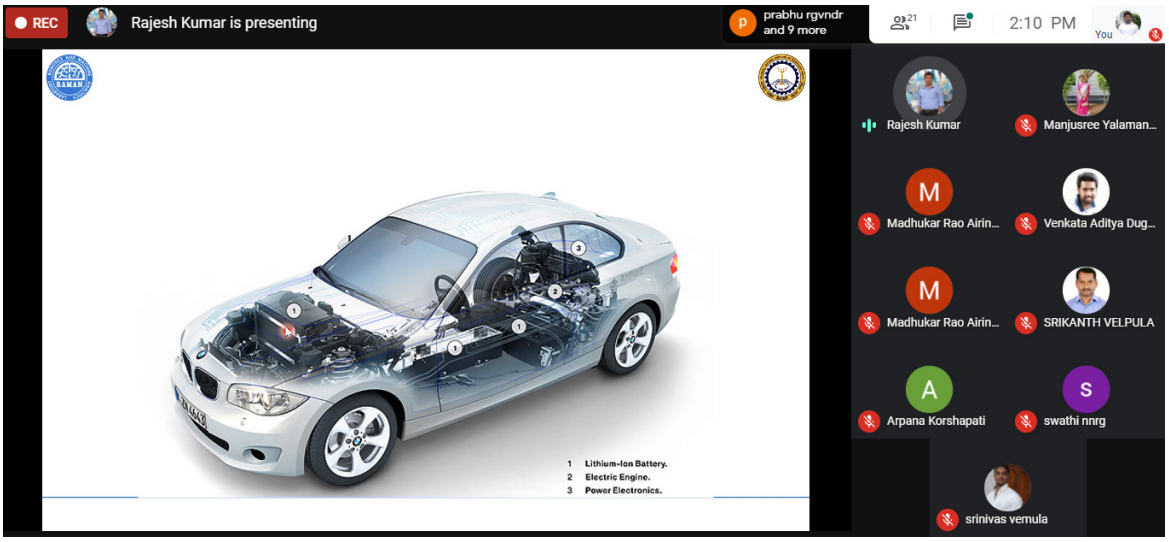
Dr. Rajesh Kumar received his B.Tech. degree from NIT Kurukshetra, India, the M. Tech. degree in Power System and the Ph.D. degree in Intelligent Systems MNIT, Jaipur. He was Post Doctorate Research Fellow in the Department of Electrical and Computer Engineering at the National University of Singapore (NUS), Singapore, from 2009 to 2011. Currently, he has been working as a Professor with the Department of Electrical Engineering, MNIT, Jaipur. Dr. Kumar research interests focus on Intelligent Systems, Machine Intelligence, Power Management, Smart Grid and Robotics. Dr. Kumar has published over 450 research articles, has supervised 20 PhD and more than 30 M.Tech thesis. He has 12 patents to his name. He received 03 academic awards, 12 best paper awards, 06 best thesis award, 04 professional awards and 25- student

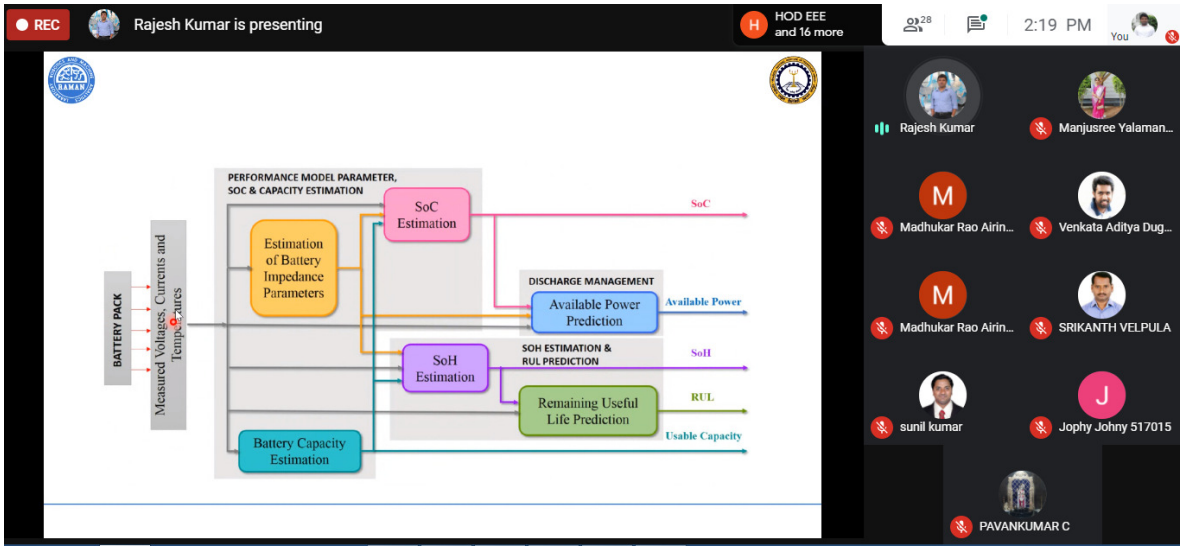
award. He has received the Career Award for Young Teachers in 2002 from Government of India. He is on 12 Journal Editorial Boards. He is an Associate Editor of IEEE Access, IEEE ITeN (Industrial Electronics technology News), Associate Editor, Swarm and Evolutionary Computation, Elsevier, Associate Editor, IET Renewable and Power Generation, Associate Editor, IET Power Electronics, Associate Editor, International Journal of Bio Inspired Computing and Deputy Editor-in-Chief, CAAI Transactions on Intelligence Technology, IET. Dr. Kumar is a Senior Member IEEE (USA), Fellow IET (UK), Fellow IE (INDIA), Fellow IETE, Life Member CSI, Senior Member IEANG and Life Member ISTE.

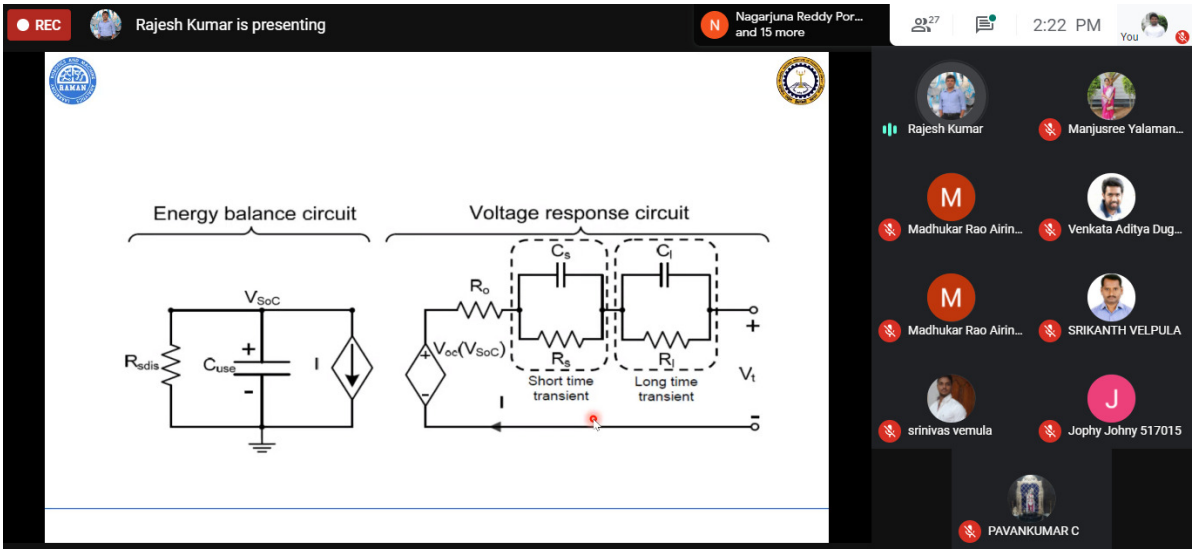
Report: Important points covered by Prof Rajesh Kumar,

- Electric transportation.
- Concept of battery management system.
- Performance model parameter, SoC and capacity estimation.
- Charging and discharging criteria.
- State of charge and state of health estimation.
- Energy balance and voltage resonance circuits.
- Minimum energy method; least squares method.
- Selection of order of fit.
- Under fit or over fit: picking an appropriate order.
- Linear regression analysis.
- Goodness of fit and the correlation coefficient.
- Equation for charging rate, state of charge and depth of charge.



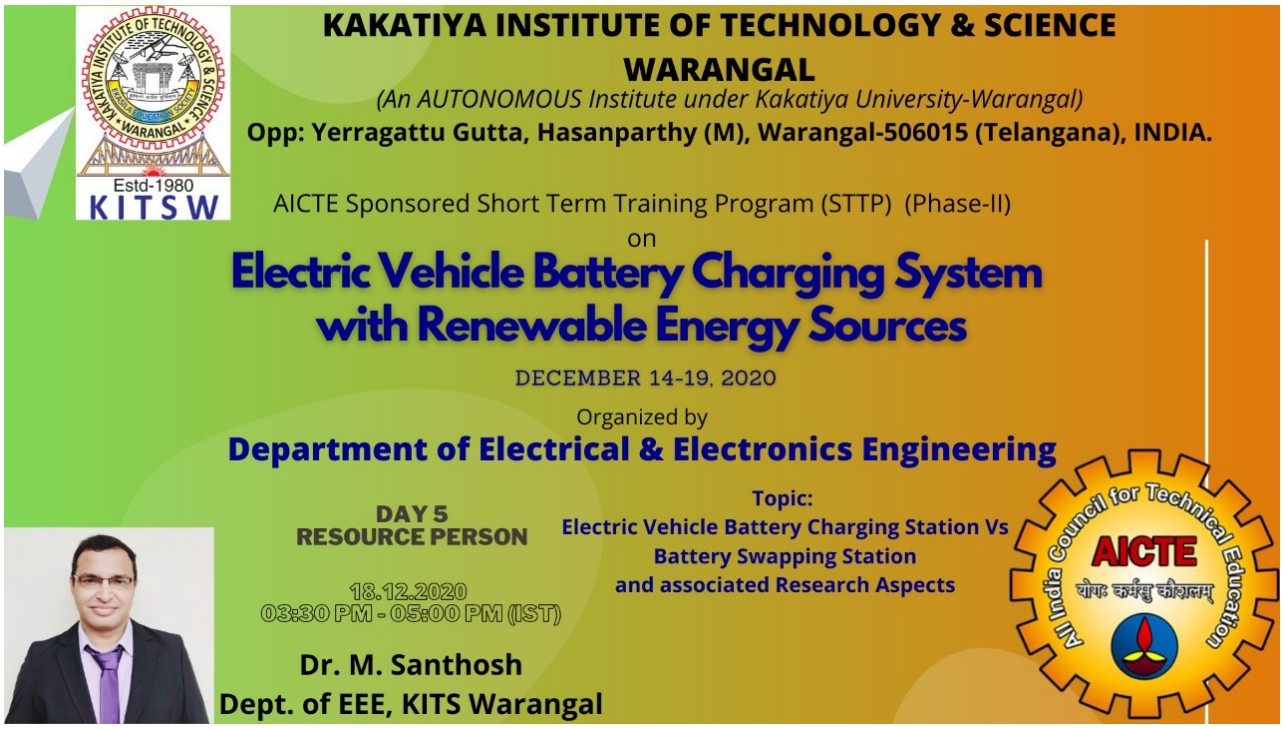

REC
Rajesh Kumar is presenting
prabhu rgvndr and 9 more
2:10 PM
You
1 Lithium-Ion Battery.
2 Electric Engine.
3 Power Electronics.
Rajesh Kumar
Manjusree Yalaman...
Madhukar Rao Airin...
Venkata Aditya Dug...
Madhukar Rao Airin...
SRIKANTH VELPULA
Arpana Korshapati
swathi nnrg
srinivas vemula


REC
Rajesh Kumar is presenting
HOD EEE and 16 more
2:19 PM
You
PERFORMANCE MODEL PARAMETER, SOC & CAPACITY ESTIMATION
BATTERY PACK
Measured Voltages, Currents and Temperatures
Estimation of Battery Impedance Parameters
SoC Estimation
SoC
DISCHARGE MANAGEMENT
Available Power Prediction
Available Power
SOH ESTIMATION & RUL PREDICTION
SoH Estimation
SoH
Remaining Useful Life Prediction
RUL
Battery Capacity Estimation
Usable Capacity
Rajesh Kumar
Manjusree Yalaman...
Madhukar Rao Airin...
Venkata Aditya Dug...
Madhukar Rao Airin...
SRIKANTH VELPULA
sunil kumar
Jophy Johny 517015
PAVANKUMAR C


REC
Rajesh Kumar is presenting
Nagarjuna Reddy Por... and 15 more
2:22 PM
You
Energy balance circuit
Voltage response circuit
V_{SoC}
R_{sdis}
C_{use}
I
R_o
C_s
C_l
$V_{oc}(V_{SoC})$
R_s
R_l
Short time transient
Long time transient
V_t
Rajesh Kumar
Manjusree Yalaman...
Madhukar Rao Airin...
Venkata Aditya Dug...
Madhukar Rao Airin...
SRIKANTH VELPULA
srinivas vemula
Jophy Johny 517015
PAVANKUMAR C

Session X (18th December 2020)

TITLE: Electric vehicle battery charging station Vs battery swapping station and associated research aspects



Resource Person:

Dr. M. Santhosh,

Assistant Professor, EEE Department,
KITS Warangal.

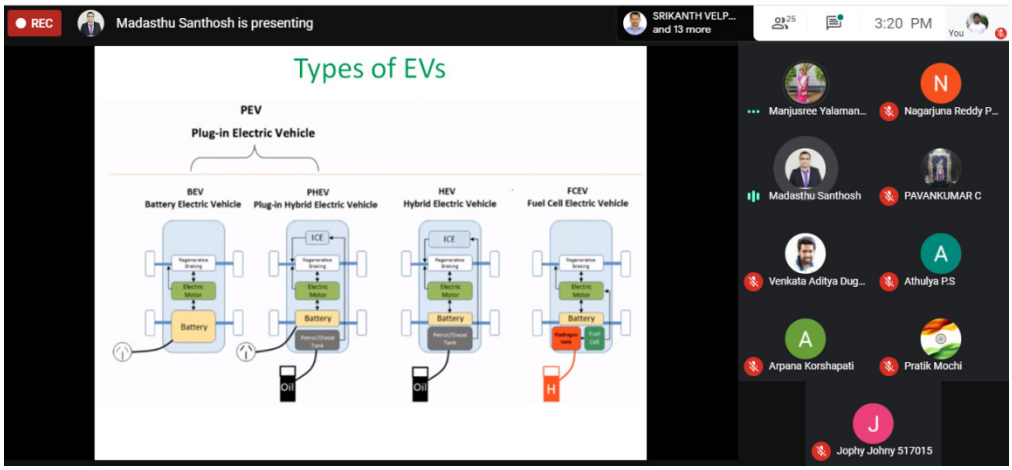
Biography:

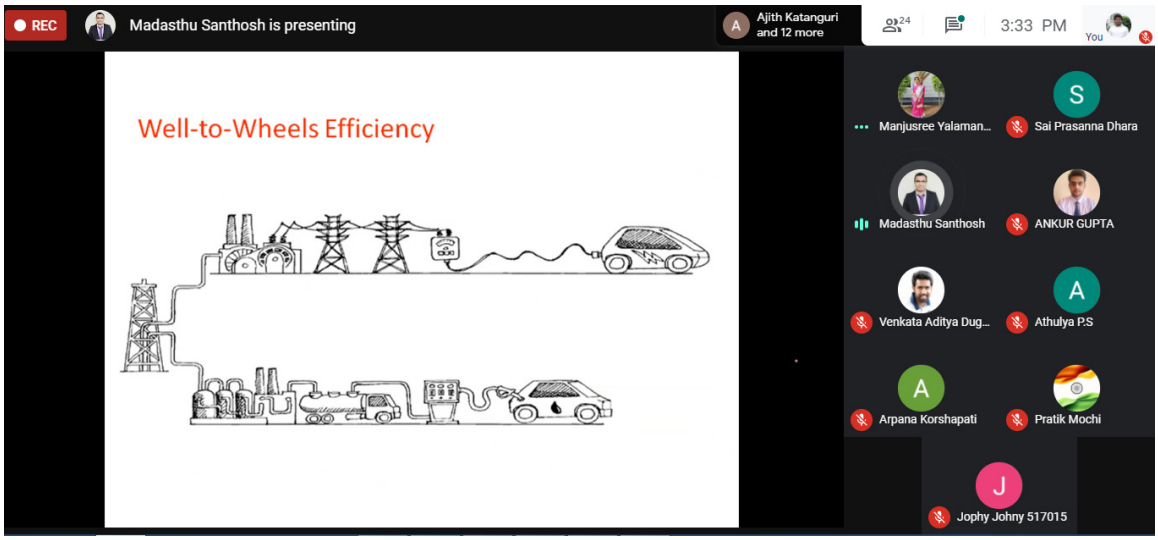
Dr. M. Santhosh received his B.Tech degree in Electrical and Electronics Engineering under JNTU, Hyderabad in 2009. He did his M.Tech in Electrical Power Systems from JNTUH College of Engineering, Jagitial in 2014. He received his Ph.D. degree from National Institute of Technology Warangal in October, 2020. He has 5 years of teaching and research experience. He has received outstanding reviewer award-2018 presented by Applied Soft Computing journal (Elsevier). Received the recognized reviewer award from Applied Energy Journal (Elsevier), Ecological Modelling (Elsevier), IEEE Access, IEEE journal of emerging and selected topics in PE (JESTPE), Lecture Notes in Electrical Engineering (Springer), and Wind Engineering journal

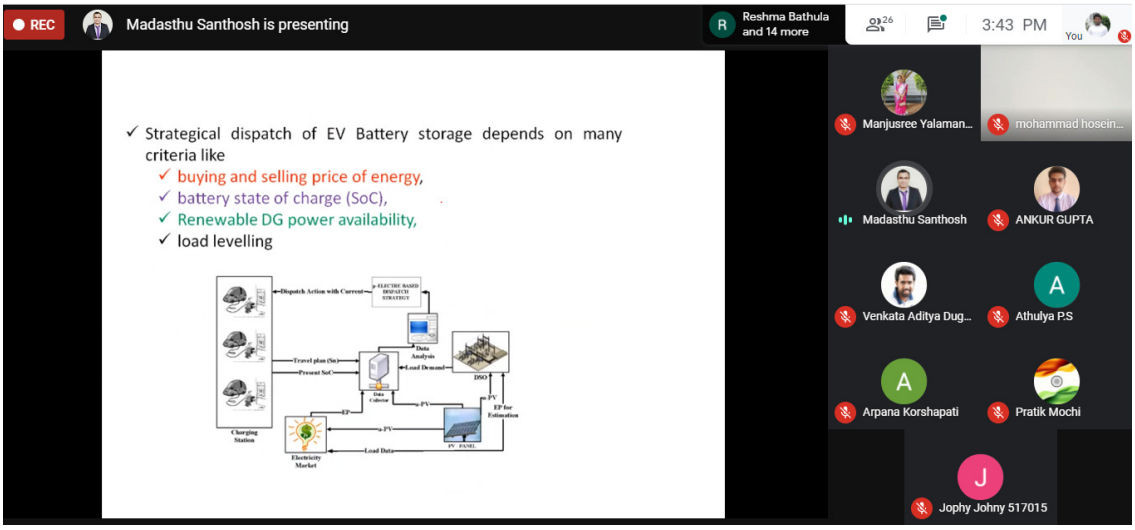
(Sage publications). He recognized for reviewing articles for reputed conferences such as PEDES, TPEC, and SEFET. He is Member IEEE-USA, and Member of Institution of Engineers-India. He has 4 international journals and 10 IEEE international and national conferences. His research interests include Artificial Intelligence and Machine Learning applications in power systems, Wind speed and wind power forecasting, Power System Control and Optimization with Renewable Energy, Block chain applications in smart grids, Electric Vehicle Fast Charging Stations study in Microgrids. He is currently working as Assistant Professor in EEE department at KITS Warangal.

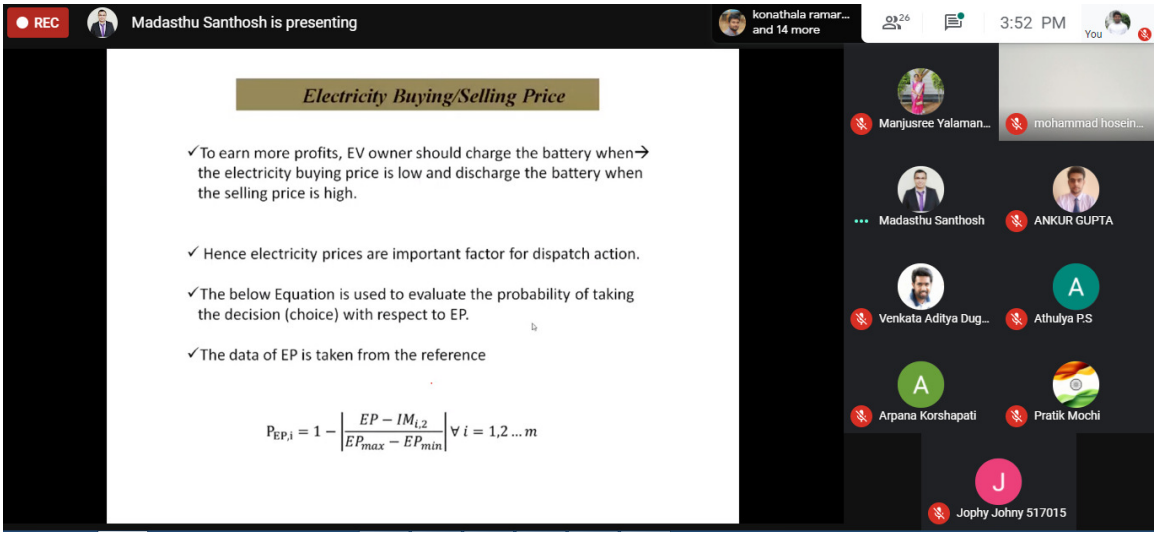
Report: Important points covered by Dr. M. Santhosh

- Introduction about electrical distribution system.
- What is a good power system?
- Types of EV's such as
  - Parallel Hybrid
  - Plug in hybrid
  - Micro hybrid
  - Series hybrid
  - Battery electric
- Drastic change in price of EV and comparison of IC engine and motor.
- Well to wheels efficiency.
- Declared country EV development goals for 2020-2030 span.
- Charging and discharging criteria of an EV.
- State of charge and state of health.
- Electricity buying and selling price.
- Placement of charging stations.
- Loss minimization and profit maximization.
- Deterrents to early user adoption.



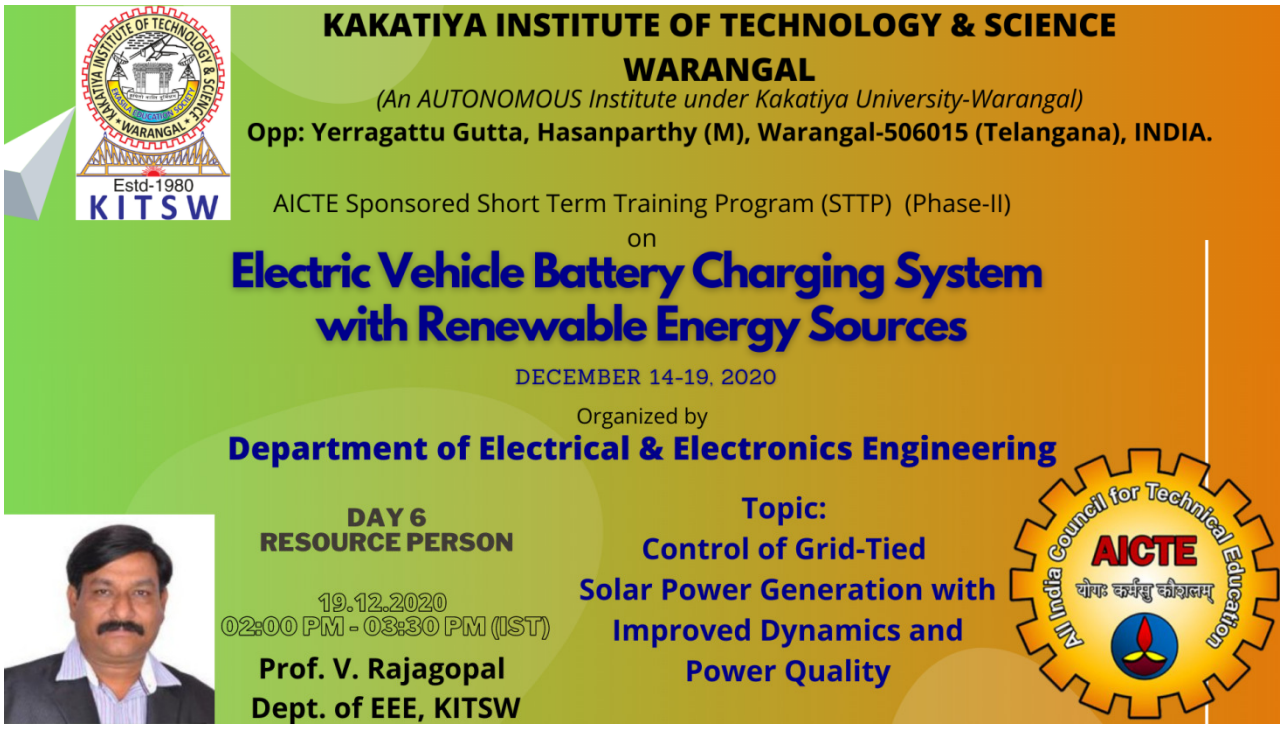

REC
Madasthu Santhosh is presenting
Ajith Katanguri and 12 more
3:33 PM
You
Well-to-Wheels Efficiency
Manjusree Yalaman...
Sai Prasanna Dhara
Madasthu Santhosh
ANKUR GUPTA
Venkata Aditya Dug...
Athulya P.S
Arpana Korshapati
Pratik Mochi
Jophy Johny 517015


REC
Madasthu Santhosh is presenting
Reshma Bathula and 14 more
3:43 PM
You
✓ Strategical dispatch of EV Battery storage depends on many criteria like
✓ buying and selling price of energy,
✓ battery state of charge (SoC),
✓ Renewable DG power availability,
✓ load levelling
Manjusree Yalaman...
mohammad hosein...
Madasthu Santhosh
ANKUR GUPTA
Venkata Aditya Dug...
Athulya P.S
Arpana Korshapati
Pratik Mochi
Jophy Johny 517015


REC
Madasthu Santhosh is presenting
konathala ramar... and 14 more
3:52 PM
You
Electricity Buying/Selling Price
✓To earn more profits, EV owner should charge the battery when→ the electricity buying price is low and discharge the battery when the selling price is high.
✓ Hence electricity prices are important factor for dispatch action.
✓The below Equation is used to evaluate the probability of taking the decision (choice) with respect to EP.
✓The data of EP is taken from the reference
$P_{EP,i} = 1 - \left| \frac{EP - IM_{i,2}}{EP_{max} - EP_{min}} \right| \forall i = 1,2 \ldots m$
Manjusree Yalaman...
mohammad hosein...
Madasthu Santhosh
ANKUR GUPTA
Venkata Aditya Dug...
Athulya P.S
Arpana Korshapati
Pratik Mochi
Jophy Johny 517015

Session XI (19th December 2020)

TITLE: Control of Grid-Tied Solar Power Generation with Improved Dynamics and Power Quality



Resource Person:

Prof V. Rajgopal,

Professor, EEE Department,
KITS Warangal

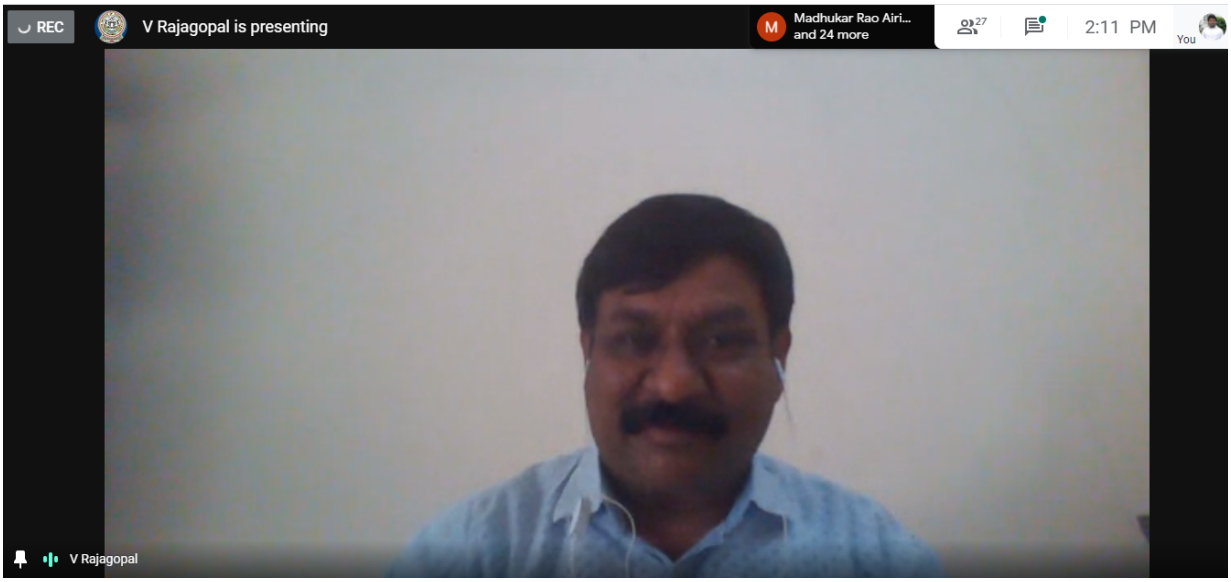
Biography:

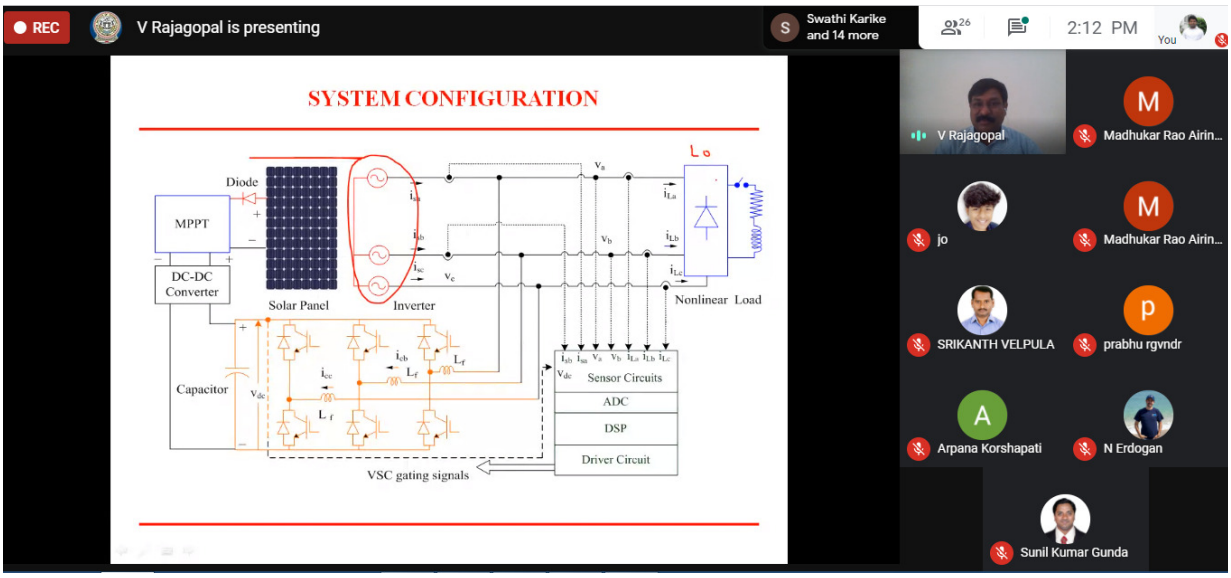
RAJAGOPAL VEERAMALLA was born in Kazipet, Warangal, India, in 1969. He received the AMIE (Electrical) degree from The Institution of Engineers (India), M.Tech Degree from the Uttar Pradesh Technical University India and Ph D degree in Indian Institute of Technology (IIT) Delhi. Currently he is working as a Professor of EEE, Kakatiya Institute of Technology and Science Warangal Telangana India. His area of interest includes power electronics and drives, renewable energy generation and applications, FACTS, and power quality. He has 01 patent, 14 International & National Journals and 40 IEEE and National conferences held at India and

abroad. He is a life member of the Indian Society for Technical Education (ISTE) and Fellow of Institution of Engineers (India) (IE (I)).

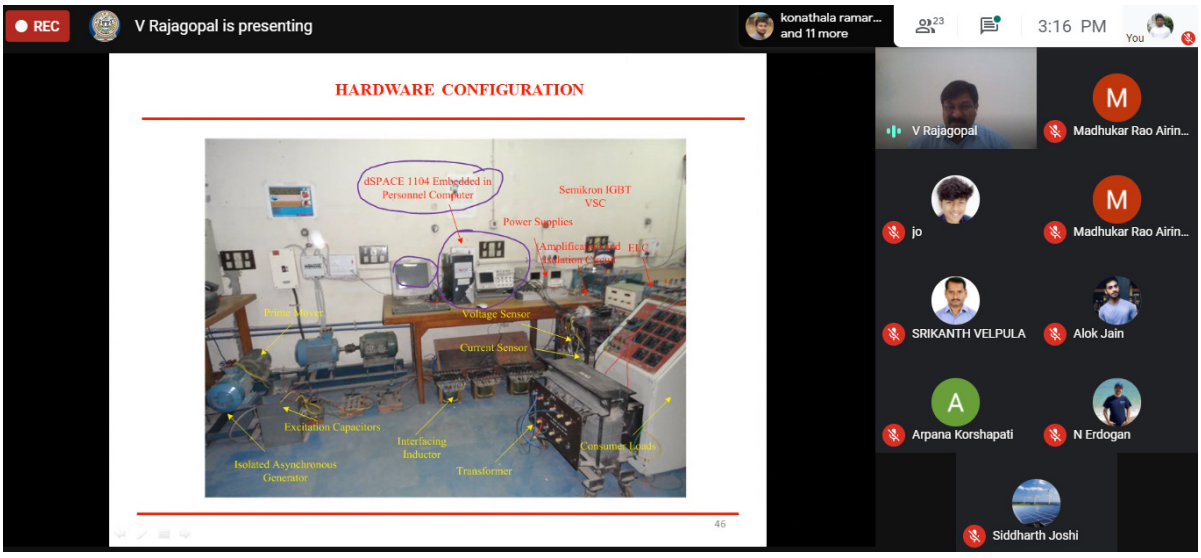
Report: Important points covered by Prof V. Rajgopal

- System configuration of a grid connected inverter.
- Components of GCI such as, solar panel, inverter, DC-DC converter, control algorithm to generate gate pulses.
- Introduction about solar energy.
- Solar cells, modules, panels, and arrays.
- Solar roof tiles.
- Introduction about DSTATCOM.
- Main challenges of solar power injection to grid such as
  - How we interconnect?
  - Poor voltage profile.
  - Power quality.
  - Load balancing.
  - Safety precautions.
- Control algorithm to generate the gate pulses:
  - Synchronous reference frame (SRF) theory.
  - Unit template technique.
- Terms related to solar power such as, irradiance, temperature, wind speed and wind direction.
- I-V and P-V curves under various conditions.
- DC-DC converter interfacing.
- MPPT: Perturb and observe, and Hill climbing algorithm.
- Photograph of experimental prototype.
- Simulation and experimental results.



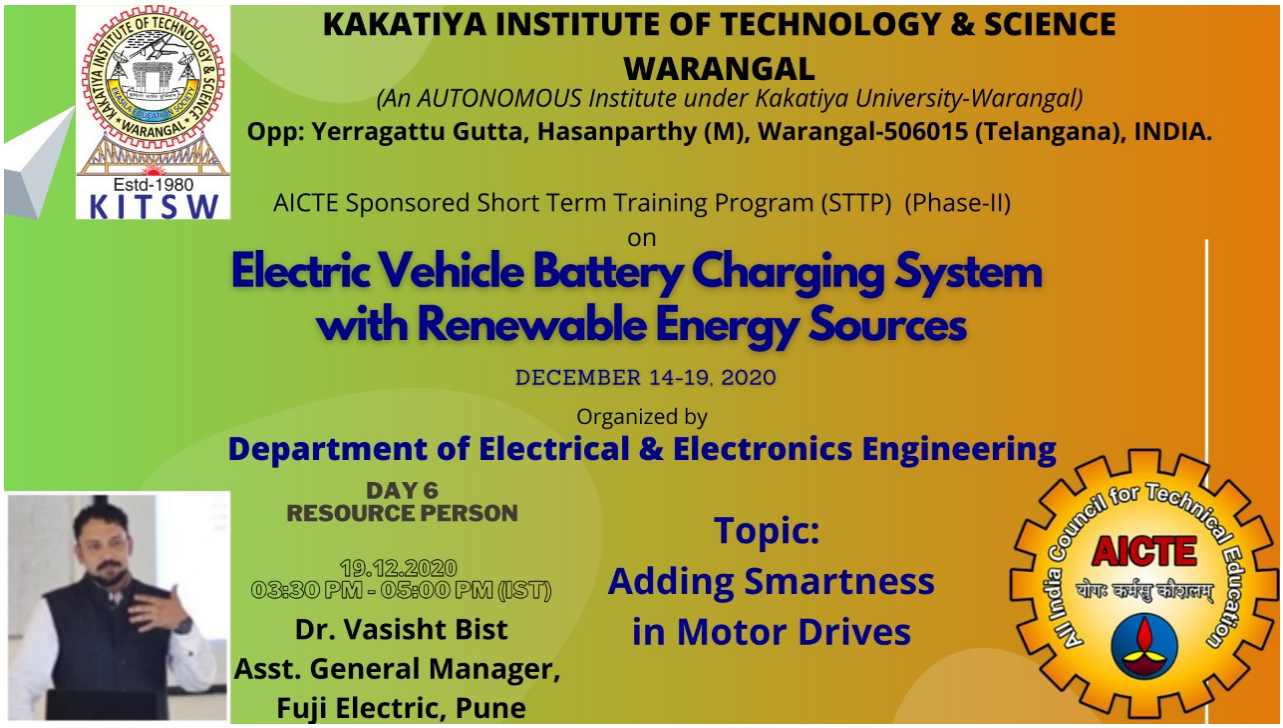

REC
V Rajagopal is presenting
Swathi Karike and 14 more
2:12 PM
You
SYSTEM CONFIGURATION
Diode
MPPT
DC-DC Converter
Solar Panel
Inverter
Nonlinear Load
Capacitor
Sensor Circuits
ADC
DSP
Driver Circuit
VSC gating signals
V Rajagopal
Madhukar Rao Airin...
jo
SRIKANTH VELPULA
prabhu rgvndr
Arpana Korshapati
N Erdogan
Sunil Kumar Gunda


REC
V Rajagopal is presenting
srinivas vemula and 15 more
2:31 PM
You
Solar Roof tiles
V Rajagopal
Damodhar Reddy
jo
Madhukar Rao Airi
SRIKANTH VELPULA
prabhu rgvndr
Arpana Korshapati
N Erdogan
Siddharth Joshi


REC
V Rajagopal is presenting
konathala ramar... and 11 more
3:16 PM
You
HARDWARE CONFIGURATION
dSPACE 1104 Embedded in Personnel Computer
Semikron IGBT VSC
Power Supplies
Voltage Sensor
Current Sensor
Excitation Capacitors
Interfacing Inductor
Transformer
Isolated Asynchronous Generator
Consumer Loads
V Rajagopal
Madhukar Rao Airin...
jo
SRIKANTH VELPULA
Alok Jain
Arpana Korshapati
N Erdogan
Siddharth Joshi

Session XII (19th December 2020)

TITLE: Adding Smartness in Motor Drives



Resource Person:

Dr. Vasisht Bist,

Asst General Manager,
Fuji Electric, Pune

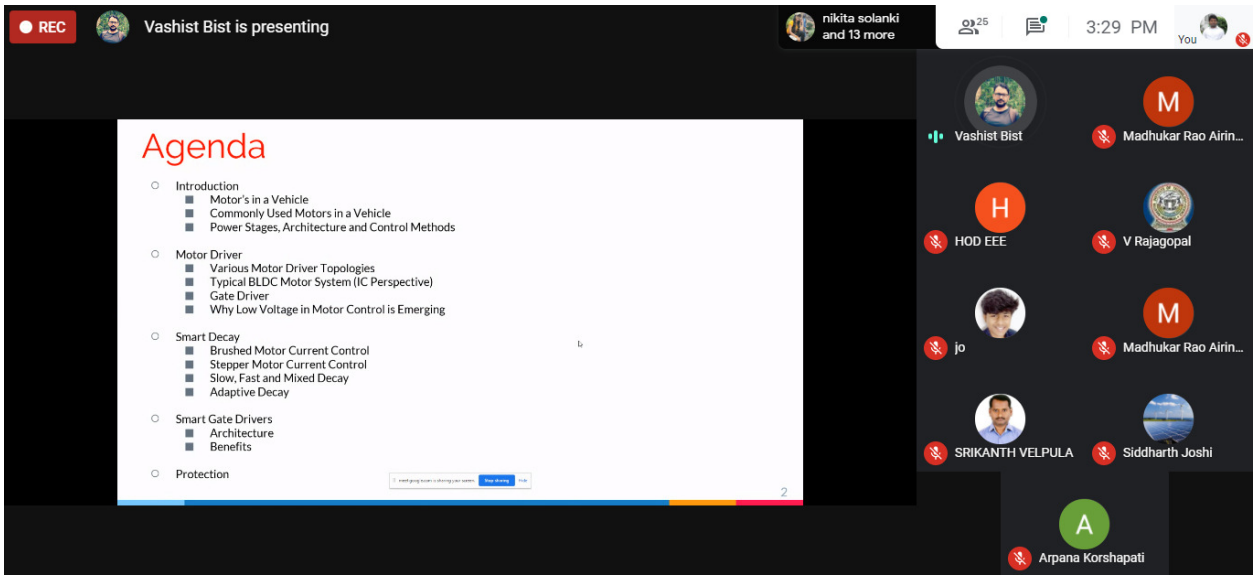
Biography:

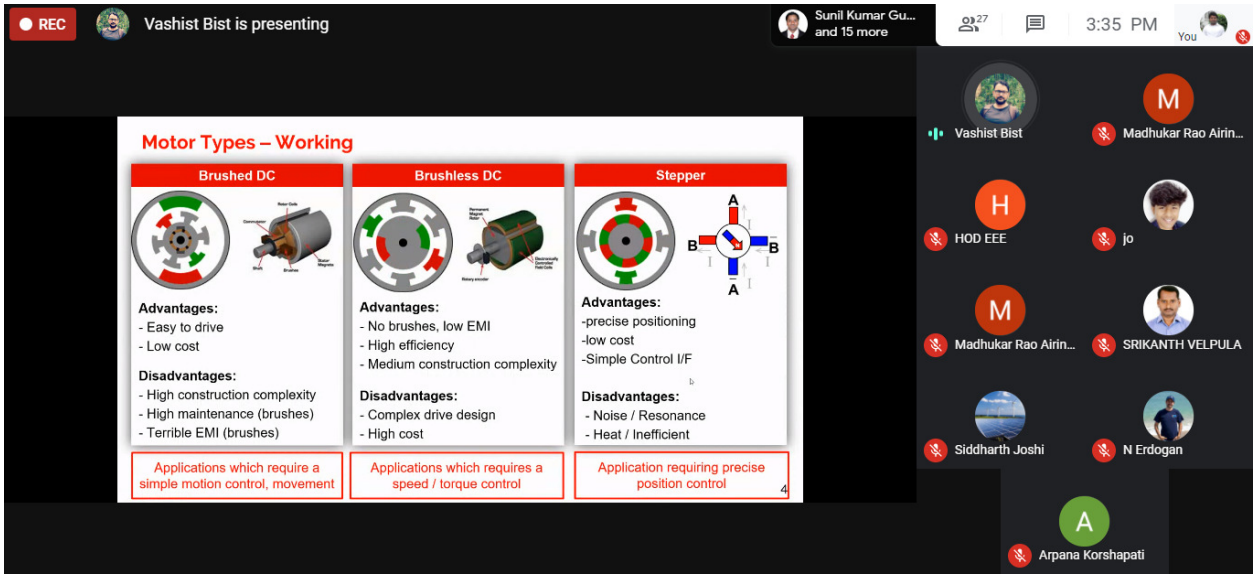
He is currently working as an Assistant General Manager (R&D) for the Research in Advanced Technologies group in Fuji Electric Consul Neowatt, Pune. He has worked as a Systems Engineer for Motor Drives in Texas Instruments, Bengaluru, India. Prior to that, He was working as a Systems Engineer (Power IC) in Avant Garde Solutions (Consultant for Allegro Micro Systems LLC USA) in Mumbai, Maharashtra, India. He has completed PhD. in Electrical Engineering with Specialization in Power Electronics, Electrical Machines and Drives from Indian Institute of Technology (IIT) Delhi. Prior to that, He has completed B. E. (Gold Medalist) and Diploma (Silver Medalist) in Instrumentation and Control Engineering in from Sant Longowal Institute of Engineering and Technology (SLIET), Longowal, Punjab in 2010 and

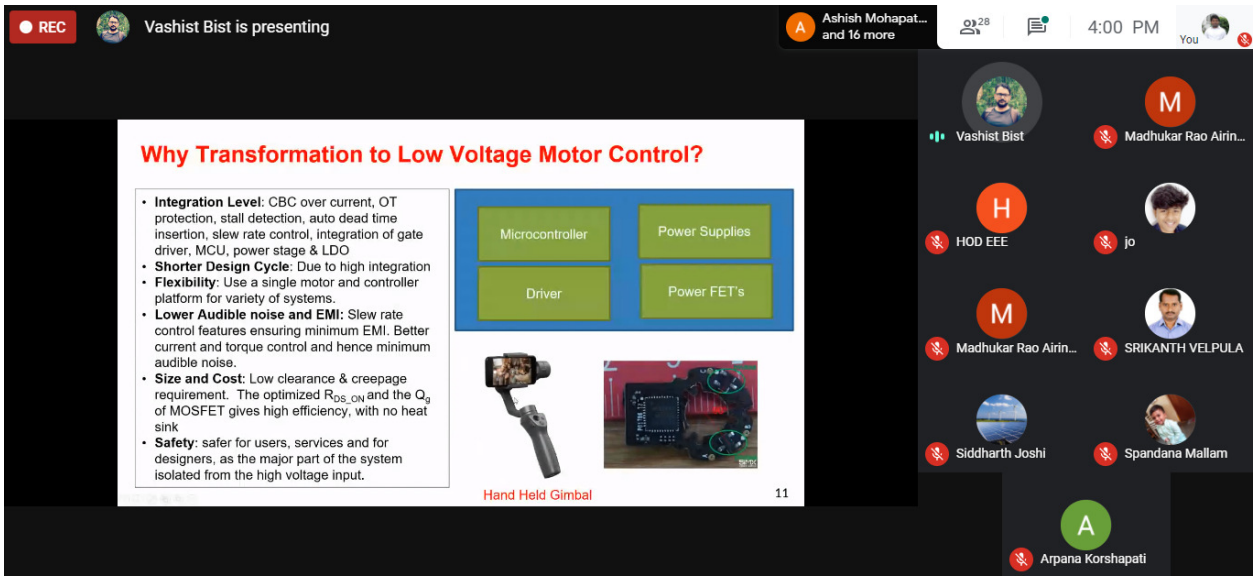
2007 respectively. He has been involved in the "Design and Development of Improved Power Quality Converters fed Permanent Magnet Brushless DC Motor Drives" at IIT Delhi. This research work was focused on the development of a low cost and highly efficient power factor correction (PFC) converters based brushless DC (BLDC) motor drive for low power applications. This work targets household appliances such as fans, refrigerators, water pumps etc.

Report: Important points covered by Dr. Vashist Bist

- Motors in a vehicle such as brushed dc motor, stepper motor and brushless dc motor and their working.
- Advantages and limitations of various motors.
- Power state architecture control methods for brushed dc motors, such as
  - Single switch.
  - Half bridge.
  - Full bridge.
- Power state architecture control methods for stepper motors, such as
  - Unipolar stepper.
  - Bipolar stepper
  - Micro stepper.
- Power state architecture control methods for brushless dc motors, such as
  - Single phase BLDC.
  - Three-phase trapezoidal BLDC.
  - Three-phase sinusoidal BLDC.
- Motor driver topologies, gate driver, controller, integrated driver.
- Explanation of motor driver system with an example.
- Why transformation to low voltage for motor control.
- Working of a brushed dc motor.
- Operation and control of a bipolar stepper motor.
- Why de decay modes matter in stepper motors.
- How smart gate drive works.
- Smart gate drive technology and its benefits.
- Examining the gate drive system.

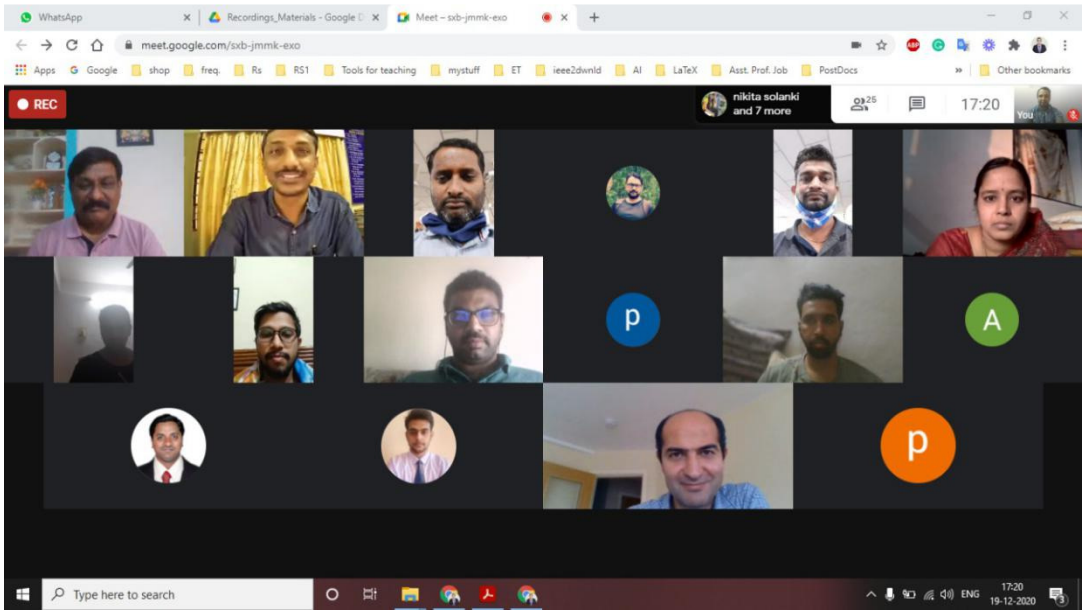

REC
Vashist Bist is presenting
nikita solanki and 13 more
3:29 PM
You
Agenda
Introduction
Motor's in a Vehicle
Commonly Used Motors in a Vehicle
Power Stages, Architecture and Control Methods
Motor Driver
Various Motor Driver Topologies
Typical BLDC Motor System (IC Perspective)
Gate Driver
Why Low Voltage in Motor Control is Emerging
Smart Decay
Brushed Motor Current Control
Stepper Motor Current Control
Slow, Fast and Mixed Decay
Adaptive Decay
Smart Gate Drivers
Architecture
Benefits
Protection
2
Vashist Bist
Madhukar Rao Airin...
HOD EEE
V Rajagopal
jo
Madhukar Rao Airin...
SRIKANTH VELPULA
Siddharth Joshi
Arpana Korshapati

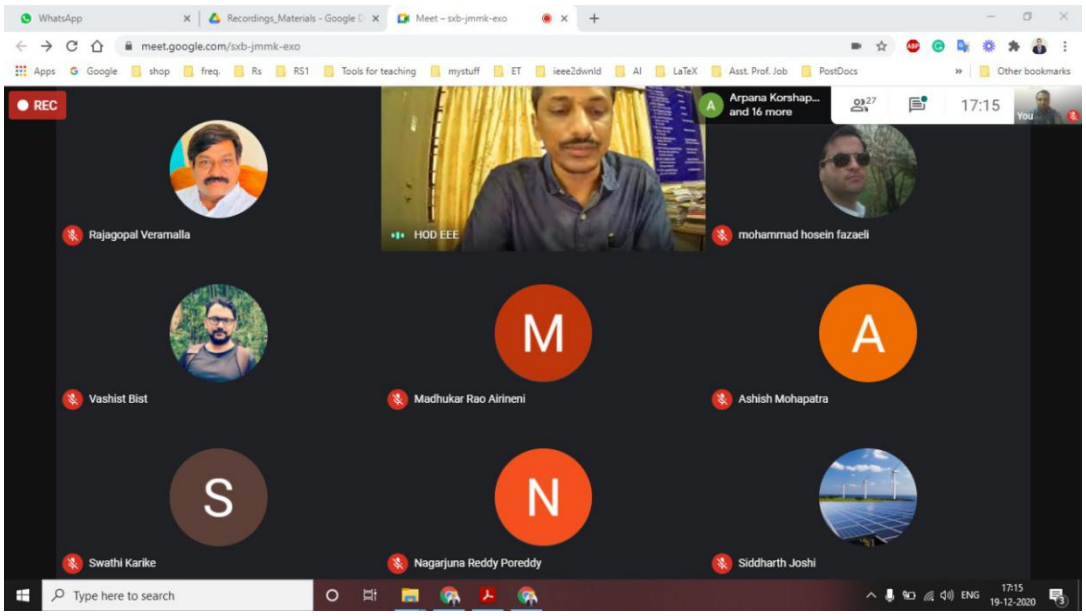

REC
Vashist Bist is presenting
Sunil Kumar Gu... and 15 more
3:35 PM
You
Motor Types – Working
Brushed DC
Brushless DC
Stepper
Advantages:
- Easy to drive
- Low cost
Disadvantages:
- High construction complexity
- High maintenance (brushes)
- Terrible EMI (brushes)
Advantages:
- No brushes, low EMI
- High efficiency
- Medium construction complexity
Disadvantages:
- Complex drive design
- High cost
Advantages:
-precise positioning
-low cost
-Simple Control I/F
Disadvantages:
- Noise / Resonance
- Heat / Inefficient
Applications which require a simple motion control, movement
Applications which requires a speed / torque control
Application requiring precise position control
4
Vashist Bist
Madhukar Rao Airin...
HOD EEE
jo
Madhukar Rao Airin...
SRIKANTH VELPULA
Siddharth Joshi
N Erdogan
Arpana Korshapati

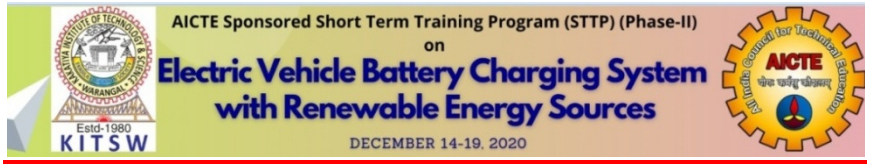

REC
Vashist Bist is presenting
Ashish Mohapat... and 16 more
4:00 PM
You
Why Transformation to Low Voltage Motor Control?
Integration Level: CBC over current, OT protection, stall detection, auto dead time insertion, slew rate control, integration of gate driver, MCU, power stage & LDO
Shorter Design Cycle: Due to high integration
Flexibility: Use a single motor and controller platform for variety of systems.
Lower Audible noise and EMI: Slew rate control features ensuring minimum EMI. Better current and torque control and hence minimum audible noise.
Size and Cost: Low clearance & creepage requirement. The optimized R_{DS_ON} and the Q_g of MOSFET gives high efficiency, with no heat sink
Safety: safer for users, services and for designers, as the major part of the system isolated from the high voltage input.
Microcontroller
Power Supplies
Driver
Power FET's
Hand Held Gimbal
11
Vashist Bist
Madhukar Rao Airin...
HOD EEE
jo
Madhukar Rao Airin...
SRIKANTH VELPULA
Siddharth Joshi
Spandana Mallam
Arpana Korshapati

Valedictory Ceremony

Prof. C. Venkatesh, Convener of this STTP started the valedictory ceremony by introducing the Chief Guest Sri Dr. Vashist Bist, followed by a brief explanation of the sessions conducted in this STTP. Chief Guest addressed all the participants and explained the importance of the research on electric vehicle for the present and future generations.







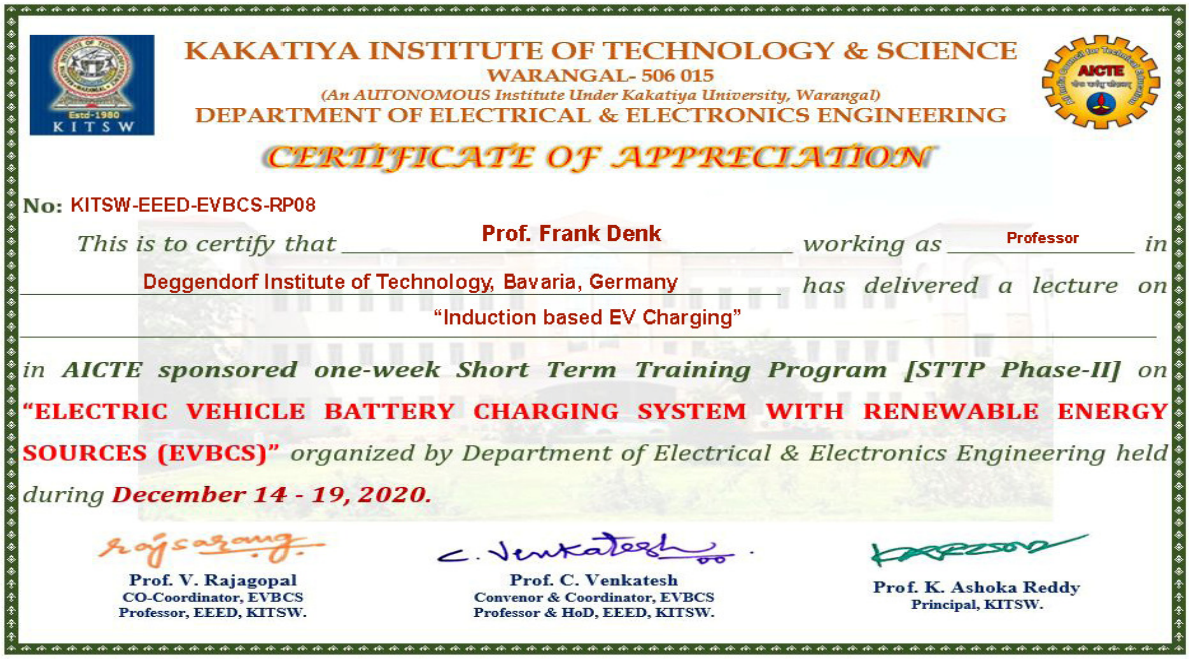
List of Participants

Unique Identification Number	Full Name	Designation	Name of the Organisation / Institute
EVBCS2001	Ashish Kumar M	Research Scholar	IIT Ropar, India
EVBCS2002	Ranjith Kumar B	Research Scholar	Anna University, CEG
EVBCS2003	Purusothaman V	Professional Assistant	CEG Campus, Chennai
EVBCS2004	Arpana Korshapati	Research Scholar	Auckland University of Technology
EVBCS2005	Pratik Mochi	Assistant Professor	Chandubhai S. Patel Institute of Technology, CHARUSAT
EVBCS2006	Abdelazeem Hassan	Research Scholar	eaea
EVBCS2007	Sibtain Hassan	Industry Delegate	Eversource Energy
EVBCS2008	Nikita Solanki	Research Scholar	IIITDM, Jabalpur
EVBCS2009	Prabu.G	Industry Delegate	Warar Energy
EVBCS2010	Ankur Gupta	Research Scholar	Indian Institute of Information Technology, Design and Manufacturing, Jabalpur
EVBCS2011	Venkata Aditya Duggaraju	Research Scholar	Indian Institute of Technology, Mandi
EVBCS2012	Ritesh Sunil Khatavkar	Research Scholar	jain college of engineering
EVBCS2013	Dr. Prerak Bhardwaj	Assistant Professor	Jaipur Engineering College and Research Centre, Sitapura, Jaipur
EVBCS2014	Sunil Kumar Gunda	Assistant Professor	Kakatiya Institute of Technology & Science, Warangal
EVBCS2015	Mavurapu Srinivas	Assistant Professor	Kakatiya Institute of Technology and Science, Warangal
EVBCS2016	D. Rakesh Chandra	Assistant Professor	Kakatiya Institute of Technology and Science, Warangal
EVBCS2017	Dr. Y. Manjusree	Assistant Professor	Kakatiya Institute of Technology and Science, Warangal
EVBCS2018	D Sai Prasanna	Assistant Professor	Maturi Venkata Subba Rao Engineering College College
EVBCS2019	Gökhan Yüksek	Research Scholar	Mersin University
EVBCS2020	Neetu Sidhharth	Research Scholar	MNIT Jaipur
EVBCS2021	Vipin Das P	Research Scholar	Motilal Nehru National Institute of Technology Allahabad

EVBCS2022	Swathi Karike	Assistant Professor	Nalla Narasimha Reddy Educational Society Group of Institutions
EVBCS2023	Kesari Hanumanthu	Research Scholar	NIT TRICHY
EVBCS2024	Dr. Alok Jain	Assistant Professor	Pandit Deendayal Petroleum University
EVBCS2025	Siddharth Joshi	Assistant Professor	Pandit Deendayal Petroleum University
EVBCS2026	Athulya PS	Assistant Professor	Rajadhani institute of Engineering and technology
EVBCS2027	Prasanna P	Mechanical engineer	Dr Ambedkar institute of technology, Bangalore
EVBCS2028	Konathala Purna Chandra Ramarao	Research Scholar	Sagi Ramakrishnam raju engineering college
EVBCS2029	Jophy Johny	Research Scholar	Sahrdaya collage of engineering and technology
EVBCS2030	Dr. Damodhar Reddy	Assistant Professor	Sasi Institute Of Technology & Engineering
EVBCS2031	Syamnaresh Garlapati	Assistant Professor	SRKR Engineering College
EVBCS2032	Talha Mujahid	Research Scholar	The Superior College (University Campus) Lahore
EVBCS2033	Ahmed Hassan	Research Scholar	The Superior College, Lahore Pakistan
EVBCS2034	M Surendar	Assistant Professor	UCETW, Kakatiya University
EVBCS2035	Arati Chougala	Research Scholar	Vellore Institute of Technology
EVBCS2036	Mohd Aarish Shaheen	Assistant Professor	University of Kashmir
EVBCS2037	Purushotaman	Industry Delegate	Warar Energy
EVBCS2038	Ganesh S	Research scholar	VMKV Engineering College
EVBCS2039	Dr. A. Rajasekhar	Assistant Professor	Kakatiya Institute of Technology and Science, Warangal
EVBCS2040	V. Srikanth	Assistant Professor	Kakatiya Institute of Technology and Science, Warangal
EVBCS2041	Sharmila	Industry Delegate	Warar Energy
EVBCS2042	Reenu Bose	Assistant Professor	SCMS school of Engineering.
EVBCS2043	M. Spandana	Assistant Professor	Kakatiya Institute of Technology and Science, Warangal
EVBCS2044	Dr. Kiran Kumar Nallamekala	Professor	Vardhaman College of Engineering
EVBCS2045	Mohammad Hosein Fazael	Industry Delegate	TAVANIR, TEHRAN
EVBCS2046	Nuh Erdogan	Research Scholar	University College Cork, National REsearch Centre
EVBCS2047	Aveens Varghese	Research Scholar	Sahrdaya College of Engg and Tech, Kerala

Sample Certificates

Resource Person



KAKATIYA INSTITUTE OF TECHNOLOGY & SCIENCE
WARANGAL- 506 015
(An AUTONOMOUS Institute Under Kakatiya University, Warangal)
DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

CERTIFICATE OF APPRECIATION

No: KITSW-EEED-EVBCS-RP08

This is to certify that Prof. Frank Denk working as Professor in Deggendorf Institute of Technology, Bavaria, Germany has delivered a lecture on "Induction based EV Charging"

in AICTE sponsored one-week Short Term Training Program [STTP Phase-II] on "ELECTRIC VEHICLE BATTERY CHARGING SYSTEM WITH RENEWABLE ENERGY SOURCES (EVBCS)" organized by Department of Electrical & Electronics Engineering held during December 14 - 19, 2020.

Prof. V. Rajagopal, CO-Coordinator, EVBCS, Professor, EEED, KITSW.
Prof. C. Venkatesh, Convenor & Coordinator, EVBCS, Professor & HoD, EEED, KITSW.
Prof. K. Ashoka Reddy, Principal, KITSW.

Participant

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

PARTICIPATION CERTIFICATE

No: KITSW-EEED-EVBCS2011

This is to certify that Venkata Aditya Duggaraju working as Research Scholar in Indian Institute of Technology, Mandi has actively participated in AICTE sponsored one week Short Term Training Program [STTP Phase-II] on "ELECTRIC VEHICLE BATTERY CHARGING SYSTEM WITH RENEWABLE ENERGY SOURCES (EVBCS)" organized by Department of Electrical & Electronics Engineering held during December 14 - 19, 2020.

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