



Sri Venkateswara  
College of  
Engineering

AICTE Sponsored International E-Conference on

# SMART TECHNOLOGIES IN ELECTRIC VEHICLES AND POWER GRID

## JAN 27-29 2021





## Message from the Cheif Patron

Welcome to the International E- Conference on SMART TECHNOLOGIES IN ELECTRIC VEHICLES AND POWER GRID sponsored by AICTE. By organizing this Conference, the College continues its commitment in bringing together researchers from academia, industry and R&D national laboratories from all over the world for intellectual interactions, scholarly discussions and creative collaborations. The current challenges faced by the world and more importantly India are Energy and Sustainability. The Conference's multidisciplinary approach on Electric Vehicle and Smart Grid is more relevant now than ever before because it is now that the borders between various disciplines are not distinct.

I am happy to learn that in spite of the global pandemic crisis, this conference has attracted more than 100 number of paper submissions from academicians, and industry professionals. I am sure this conference will provide all the participants with opportunity to present, contribute, and examine scientific questions, achievements, issues and challenges in the emerging fields of Electric Vehicle and Smart Grid. Finally, I would like to thank each of you for attending this impressive conference and bringing your expertise to our gathering.

Dr.A.C. Muthiah  
Chairman  
Sri Venkateswara Educational  
and Health Trust



## Message from the Patron

I am delighted to note that the Department of Electrical and Electronics Engineering, Sri Venkateswara College of Engineering has organized an International E- Conference on SMART TECHNOLOGIES IN ELECTRIC VEHICLES AND POWER GRID sponsored by AICTE, New Delhi.

Being pollution is related with conventional electrical energy production, and conserving this energy using some smart technologies will reduce the pollution. Not only conserving but also use the renewable energy methods to produce this energy will save some natural resources. I am sure that this conference will create an ideal platform for the researchers from academia, Industry and R&D laboratories, to participate, present and share their knowledge in the emerging fields of Electric Vehicle, Smart grid and Renewable energy towards the conference objectives.

I hope that all the participants will be benefitted through meaningful interaction in this conference, and I wish the conference a grand success.

Prof. Muthukumaran Sivanandham  
Secretary  
Sri Venkateswara Educational  
and Health Trust



## Message from the Patron

Conferences at different levels are necessary and crucial for the adoption of newer and smart technologies in Engineering and technology ecosystem. Sharing of Intellectual outcome and securing critical feedback from peers, forge the effective adaptation of these technologies. At the outset, I would like to congratulate the organizers of International E- Conference on SMART TECHNOLOGIES IN ELECTRIC VEHICLES AND POWER GRID in bringing together all the researchers from different parts of the world in an online mode to share their research outcomes. The current pandemic situation has created newer opportunity for the students and the experts from around the world to meet in an online mode.

I am pleased to know that over 100 papers have been received for this E- Conference from across the country. I am sure that this Conference will serve the purpose of providing the right stage for the researchers to showcase their findings and present to the experts in their chosen field.

The challenges in the adoption of Electric vehicle and wide spread implementation of smart grid technologies necessitates the coming together of Engineers and Scientists from academia and industries across the globe. The proceedings of this conference will serve as a repository of information that will inspire and make the participants ready for the next level in their digital transformation journey.

I wish the Conference a great success.

Dr.S.Ganesh Vaidyanathan  
Principal  
Sri Venkateswara College of Engineering

## Message from the convener



I am very glad that the International E- Conference on SMART TECHNOLOGIES IN ELECTRIC VEHICLES AND POWER GRID sponsored by AICTE, New Delhi, has shaped into a three day event that provides a common platform to bring diversified researchers in the field of Smart Electric Vehicle; Smart grid; Smart Battery Management; Device Modeling, Circuits and Systems; Communication, Computing in EV and Micro grid; and Smart Technologies in EV and Smart Grid. STEP 2021 brings engineers, scientists and students across the globe to share their research findings, thereby creating a meaningful network and possible collaboration.

On behalf of the organizing committee, we are glad in welcoming all the delegates and participants to the STEP 2021 from 27th to 29th January 2021. We hope that the interactions in the E-conference will have a positive impact on the realization of smart technologies in the above mentioned emerging fields.

We would like to thank all the members of the organizing committee for making this event successful. We thank all the participants for their contribution, and wish all get benefitted from the E-Conference.

Dr. KR. Santha  
Vice-Principal  
Professor and Head / EEE  
Coordinator-STEP 2021





Dr.C.Gopinath, Asso. Professor/EEE



Ms. S.Arulmozhi, AP / EEE



Ms. N.Shanmugavadivu, AP / EEE



Dr.T.Annamalai, AP / EEE



Mr.D.S.Purushothaman, AP / EEE



Prof. J. Venkatesan, HOD / AUT



Prof. R. Anitha, HOD / CSE



Prof. R. Muthukumaraswamy, HOD  
/ APM



Prof. V. Sumitha, HOD / BIO



Prof. S. Muthukumar, HOD / ECE



Prof. A. Bhaskaran, HOD / APH

Prof. N. Meyyappan, HOD / CHE



Prof. V. Vidya, HOD / INT

Prof. G. Devasagayam, HOD / ACH







Prof. R. Kumutha, HOD / CVE



Prof. S. Krishnan, HOD / MAR



Prof. T. Murugavel, HOD / HSS



Prof. S. Ramesh Babu, HOD / MEC

# DAY-1

01

## Inauguration

02

### Inaugural Address:

Prof.VignaKumaran A/L Ramachandramurthy  
Head of Power Systems,  
Power Engineering Centre  
UniversitiTenagaNasional ,  
The Energy University, Malaysia

03

### Keynote Lecture -1

Topic : Smart Grid  
Prof.K.Vijayakumar  
IIITDM, Kancheepuram

04

### Keynote Lecture -2

Topic: Electric Vehicle - Fuel Cell  
Dr. R. Balaji,  
Senior Scientist, Centre for Fuel Cell Technology,(ARCI)  
IITM Research Park , Taramani, Chennai-600113

05

### Technical Session - I Smart Electric Vehicles

Session Chair 1: DrK.Padmanathan,  
Director, Nest Lives Private Limited, Chennai  
Session Chair 2: Dr.V.Ganesh, AUT, SVCE  
Session Chair 3: Dr. C.Gopinath, EEE, SVCE

06

### Technical Session - II Smart Grid

Session Chair 1: Dr.D.Silas Stephen, Panimalar Engineering College,  
Chennai  
Session Chair 2: Dr. S.G. Bharathidasan, EEE, SVCE  
Session Chair 3: Dr.M.Sankar, EEE, SVCE

# DAY-2

01

## Keynote Lecture -3

Topic: Smart Battery Management  
Mr. P Prasanth Kumar  
HarithaTechLogixPvt.Ltd , Bengaluru

02

## Keynote Lecture -4

Topic: Research Awareness about Electric Vehicle  
Mr. S. Sundareswaran, Head- Opns  
-EV, Ashok Leyland, Chennai.

03

## Technical Session - III Smart Technologies- Communication

Session Chair 1: Dr. P. Karuppanan, MNNIT, Allahabad  
Session Chair 2: Dr.P.Jothilakshmi, ECE, SVCE  
Session Chair 3: Dr. T. Sukumar, IT, SVCE  
Session Chair 4: Dr. S. R. Malathi, ECE, SVCE

04

## Technical Session - IV Smart Technologies

Session Chair 1: Dr.P.Prabhavathy, SRMIST Deemed University,  
Session Chair 2: Dr. J.M.Gnanasekar, CSE, SVCE  
Session Chair 3: Dr. C.Yaashuwanth, IT, SVCE

05

## Technical Session - V Smart Technologies

Session Chair 1: Dr.N P Subramaniam, Pondicherry Engineering College, Puducherry  
Session Chair 2: Dr. G.A.Sathish Kumar, ECE, SVCE  
Session Chair 3: Dr. N. Rajeswari, CSE, SVCE

# DAY-2

06

## Keynote Lecture -5

Topic: Research Awareness about Electric Vehicle  
Mr. S. Sundareswaran  
Head- Opns -EV, Ashok Leyland, Chennai

07

## Keynote Lecture -6

Topic: Renewable Energy - EV and Smart Grid /  
Investigation on the Advanced control Strategies  
of Grid-tied Solar PV system  
Prof.B.ChittiBabu,  
IIITDM, Kancheepuram

08

## Technical Session - VI Smart Technologies & Battery Management

Session Chair 1: Dr. S. Sathiyamurthy, Easwari  
Engineering College, Chennai  
Session Chair 2: Dr. R . Ramesh, MEC, SVCE  
Session Chair 3: Dr. R.Palani, CHE, SVCE

09

## Technical Session - VII Renewable Energy

Session Chair 1: Dr.S.Abdul Rahman, University of  
Gondar, Ethiopia  
Session Chair 2: Dr.M.Gajendran, MEC, SVCE  
Session Chair 3: Dr.M.YogeshKumar, CHE, SVCE

10

## Technical Session - VIII Smart Technologies, IOT

Session Chair 1: Dr.R. N. Ponnalagu, BITS Pilani, Hyderabad  
Session Chair 2: Dr. G. Padmavathy, ECE, SVCE  
Session Chair 3: Dr. R. Karthikeyan, EEE, SVCE  
Session Chair 4: Dr.K.S.Gayathri, CSE, SVCE

# DAY-3

01

## Keynote Lecture -7

Topic: Power Converter Topologies - Electric Vehicle  
Prof.P.Sanjeevikumar,  
Aalborg University, Department of Energy Technology,  
Denmark

02

## Technical Session - IX Power Converter

Session Chair 1: Dr.S.Albert Alexander, Kongu  
Engineering College, Erode  
Session Chair 2: Dr. Sudhakar K Bharatan,EEE, SVCE  
Session Chair 3: Dr. T.Annamalai , EEE, SVCE

03

## Technical Session - X Power Converter

Session Chair 1: Dr.S.Arunachalam, Jubail Industrial  
College , Saudi Arabia  
Session Chair 2: Dr. N K Mohanty, EEE, SVCE  
Session Chair 3: Dr.R.Govindarasu,CHE, SVCE

04

## Technical Session - XI Battery Management & Nano Technology

Session Chair 1: Dr.K.Venkatraman, SCSVMV Deemed  
UniversityKanchipuram  
Session Chair 2: Dr. V. Nalinkanth Veerabadran Ghone,PhD  
(USA), CHE,SVCE  
Session Chair 3: Dr.S.Ponnuvel, MEC, SVCE  
Session Chair 4: Dr. R. Kannadasan, EEE, SVCE

05

## Valedictory Function

Valedictory Address:  
Prof. Vaidehi Vijayakumar  
Vice Chancellor,  
Mother Teresa Women's University, Kodaikanal.



# ABOUT THE PROGRAM

The International E-Conference on Smart Technologies in Electric Vehicles and Power grid, STEP-2021 was sponsored by All India Council for Technical Education, AICTE and was organized by the Department of Electrical and Electronics Engineering of Sri Venkateswara College of Engineering. STEP 2021 was a three day conference which was conducted from 27th January 2021 to 29th January 2021. The conference was hosted online on Google Meet platform at 10.00 A. M and was witnessed by over 100 participants.

The conference provides space for the researchers to present their results of research work and knowledge sharing in the field of smart technologies in EVs and Power Grid. It also enables in creating collaborative links between academia and professional practitioners and their workplaces, aiming at long-term sharing of knowledge and discussions of current innovations

# INAUGURAL FUNCTION



The Inaugural function was held on 27th January, Forenoon Session **Dr.Sudhakar K Bharatan**, Assistant HOD, EEE department, warmly welcomed the gathering. Following which a delightful Prayer song was sung.

**Dr. C. Gopinath**, Associate Professor of EEE department and Organizing Secretary of STEP 2021 delivered the welcome address and wished good luck to all the participants.

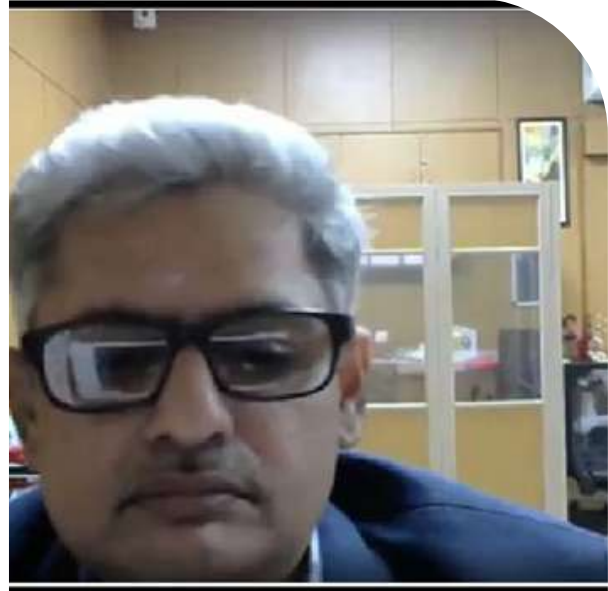


Followed by the welcome address, the conference address was delivered by **Dr. K. R. Santha**, Vice Principal and Head of the Department, EEE. Dr. K. R. Santha expressed her gratitude to the Principal and the Secretary for giving the opportunity to the Electrical and Electronics department to organize this international E-conference.



**Dr. M. Sivanandham**, Secretary of Sri Venkateswara Educational and Health Trust, delivered the patron address and inspired the participants with the upcoming innovations in the electric field all over the world. He also gave insights on energy management and implementation of Electric vehicles.

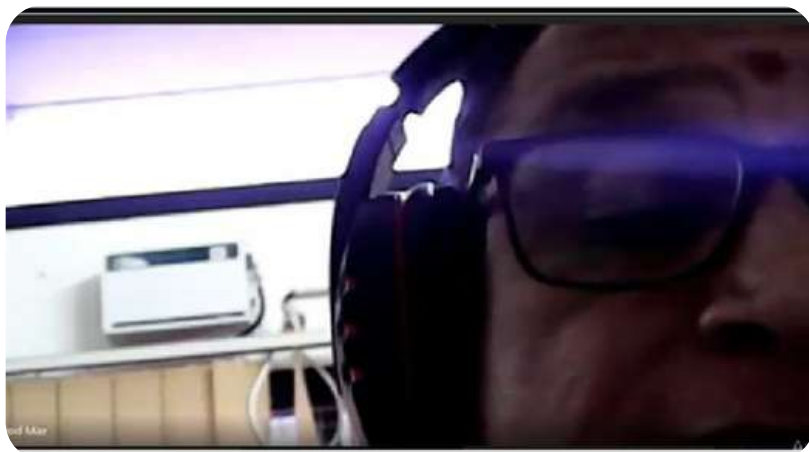
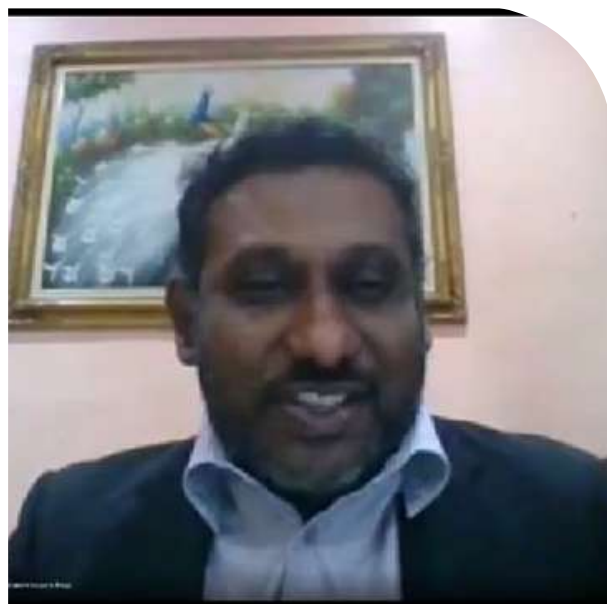
Followed by the patron address by Dr. M. Sivanandham, **Prof. Dr. S.Ganesh Vaidyanathan**, Principal of SVCE, delivered the presidential address and he insisted on the usage of smart technologies to benefit the society.



**Dr. S. Ramesh Babu**, Hod of Mechanical department, then introduced and welcomed the chief guest of the inauguration ceremony, Prof.Vigna Kumaran A/L Ramachandramurthy.



The chief guest, **Prof. Vigna Kumaran A/L Ramachandra Murthy** is the Head of Power Systems, Power Engineering Centre, Universiti Tenaga Nasional, The Energy University, Malaysia. He gave the participants detailed insights on deployment of electric vehicles. He also motivated the upcoming researchers and supervisors with important key points like mindset, practical thinking, ethics, etc.



The inauguration ceremony came to an end by the vote of thanks delivered by **Prof. S. Krishnan**, Head of the Marine Department.

After the inaugural address the program was conducted as per the schedule. Every day in each session a keynote lecture was delivered by the expert speakers in respective field. Few such keynote address and technical session details were given below.



27/01/2021

# KEYNOTE SESSION-I

time: 1:30-2:00PM

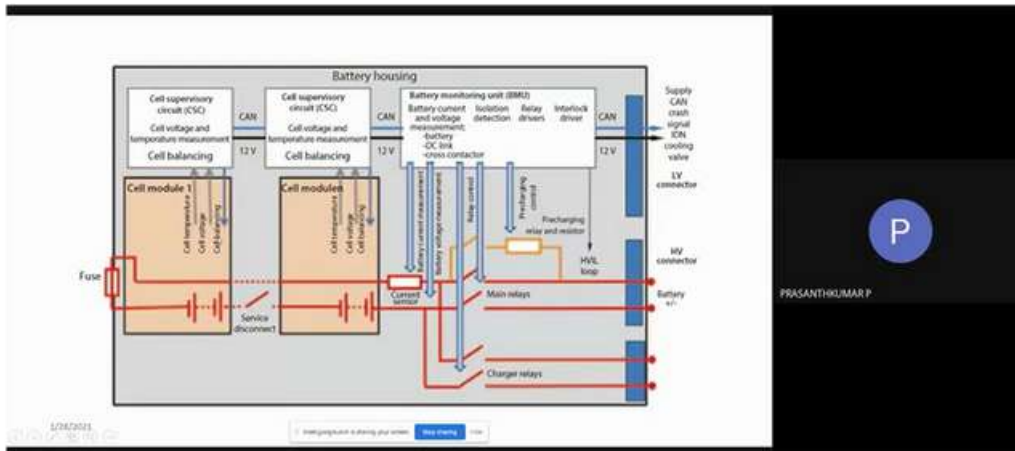


The Keynote Lecture 1 was held on 27th January 2021 at 1.30 PM on Google Meet platform with over 50 participants. The lecture was on the topic "Smart Grid Technologies" and it mainly focussed on IoT and Wind Energy Systems. The lecturer Dr. K.Vijayakumar, Professor in the School of Electrical and Computer Engineering, Indian Institute of Information Technology Design and Management. His research interest includes dsp based power electronics, controllers for renewable energy, industrial electronics and control, smart grid and SMPS for telecommunication systems. During his lecture, he gave detailed explanations on the roles of IoT in Smart Grid. This lecture lasted for about 30 minutes.

28/01/2021

# KEYNOTE SESSION-III

time: 9:30-10:00AM



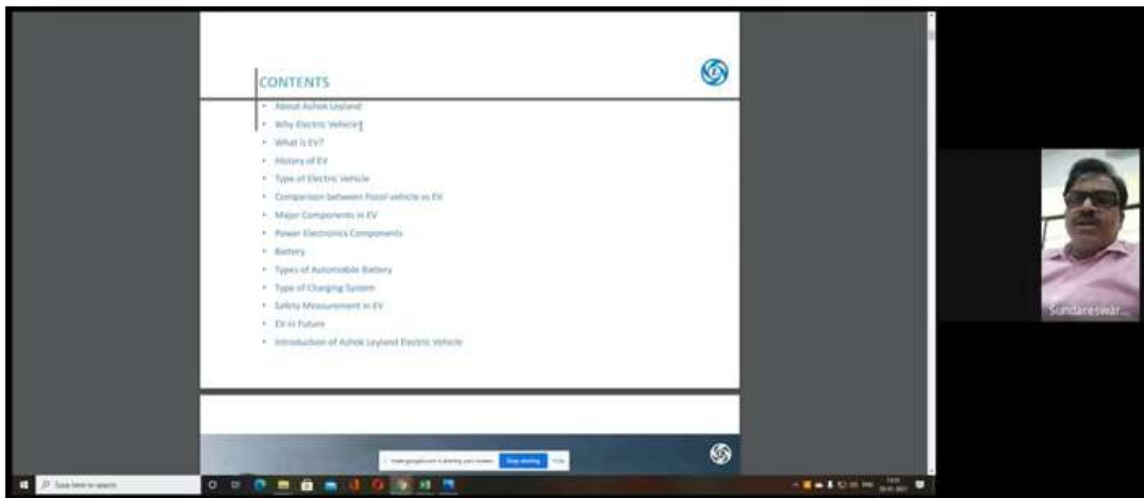
The Keynote Lecture 3 was held on Google Meet with a count of more than 100 participants. It commenced with Prof. Sudhakar K Bharatan introducing the Lecturer of the hour- Mr. P Prasanth Kumar who is currently working at Haritha TechLogix Pvt. Ltd, Bengaluru as a Technical consultant and Trainer. Till date, he has trained more than 4500 students and 1000 faculties and 500 professionals from various automotive domains.

The lecture was focused on the topic 'Smart Battery Management' and it lasted for 30 minutes. With the EVs being the future automotive vehicle running the world, he sublimely elucidated the importance of compact batteries and an efficient BMS. It concluded with an interactive questionnaire.

28/01/2021

# KEYNOTE SESSION-V

time: 9:30-10:00AM



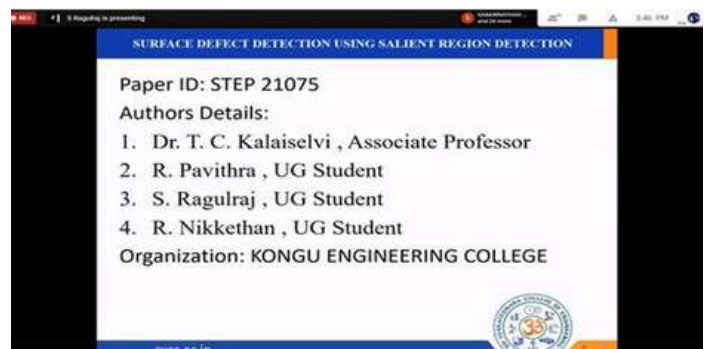
The keynote lecture 5 was hosted online in Google Meet platform on 28th January 2021 at 1.30 PM. Over 60 participants witnessed this lecture. The topic of this lecture was "Research Awareness about Electric Vehicle" and it was presented by Mr. S. Sundareswaran, Head- Opns -EV, Ashok Leyland, Chennai. The lecture covered various aspects of the Electric Vehicle Ecosystem including Terminology, History, Power Electronics Components, Battery and Charging Stations. The lecture also gave an insight into Electric Vehicle Production in Ashok Leyland. The lecture came to an end with the questionnaire.

# Technical Session Report

27/01/2021

## TECHNICAL SESSION - I

time: 1:30-2:00PM



As a part of the conference, on day 1 – 27th January 2021, at 2.30 PM, Technical Session-I on “Smart Electric Vehicles” commenced with a total strength of 22. Mrs. Arulmozhi, Assistant professor, dept of EEE hosted the entire session. First, she introduced and welcomed our session chairs for session 1. Session chair 1: Dr K. Padmanathan, Director, NestLives Private Limited, Chennai.

Session chair 2: Dr. V. Ganesh, AUT, SVCE.

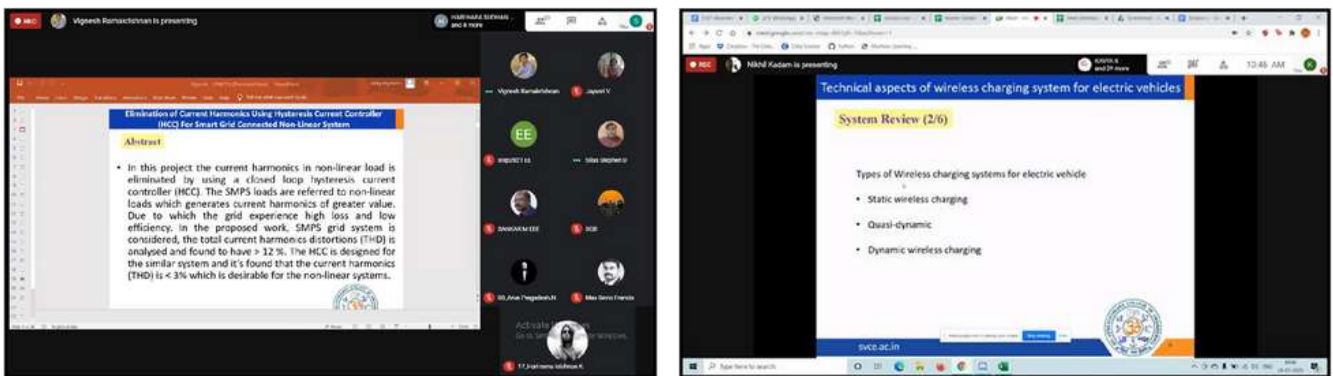
Session chair 3: Dr. C. Gopinath, EEE, SVCE

Followed by a welcome address, she welcomed the participants of that session, and moved on with presentations. Session 1 had 8 presentations on Smart Electric Vehicles by various students, faculties and research scholars of various colleges. The authors are provided with 7 minutes presentation and 3 mins discussion with session chairs. The event ended by 5.00 pm.

27/01/2021

# TECHNICAL SESSION-II

time: 2:30-5:00PM



Technical Session 2 of the STEP Conference concentrated on the domain of "Smart Grid". Session Chair 1: Dr.D.Silas Stephen, Panimalar Engineering College, Chennai

Session Chair 2: Dr. S.G. Bharathidasan, EEE, SVCE

Session Chair 3: Dr.M.Sankar, EEE, SVCE

The session chairs presided over the session. The session began at 2:30 P.M. with the strength of 21 authors and co-authors from various Institutions. A total of 7 Papers was presented during the course of this session, everything based on the domain of smart grid technologies. Each paper was allocated 10 minutes time which consisted 7 minutes of presentation and 3 minutes of questionnaire. After each paper is presented the session was open to questions and discussions. The questions were raised by the fellow presenters and the session chair. Also many ideas, comments and suggestions were given to each presenter as to how their works could be improved by the Session chair, which they found very useful. The feedback form was posted in regular intervals and the presenters were asked to fill it.



28/01/2021

# TECHNICAL SESSION-III

time: 10:30AM-01:00PM



The technical session 3 held on the topic SMART TECHNOLOGIES. The session started at 10:30AM. Dr.C.Gopinath gave an introduction about the head session chair , Dr.P.Karuppan who received IETE J.C.Bose Memorial award.. Along with Dr.P.Karuppanan , there were 3 more session chairs.

Session Chair 1: Dr. P. Karuppanan, MNNIT,Allahabad Session Chair 2: Dr.P.Jothilakshmi , ECE, SVCE Session Chair 3: Dr. T. Sukumar , IT, SVCE Session Chair 4: Dr. S. R. Malathi, ECE, SVCE

The head session chair shared his views on smart technologies and gave instruction to the participants. There were totally 9 teams . Each team was given 7 minutes for their presentation and 3 minutes for questionnaire session.This event had a maximum of 54 students. And the participants presented their unique papers and answered the questions asked by the session chairs.Once the participants completed their presentations , they were asked to fill the feedback forms and the session chairs evaluated them with their questions . Finally the session chairs discussed all the presentations and selected the winner. The Technical session 3 ended by 1PM.

# VALEDICTORY FUNCTION

Three Days, Seven Keynote Lectures, Eleven Technical Sessions, 100+ Technical Papers, 400+ Presenters, the International E-conference on Smart technologies in Electric Vehicles and Power Grid, STEP-2021 has come to its end with this Valedictory Function. The valedictory function commenced at 2 P.M. on 29.01.2021. Total of 140 Students, Research Scholars, Professors, were present during the course of the valedictory function.

It was graciously hosted by Ms.Arulmozhi.S AP/EE and Ms.Maadhuri.M AP/EE. The Welcome address was delivered by Dr.J.Venkatesan Professor & Head / AE, SVCE.



A detailed conference report was given by Dr.KR.Santha ,Professor & Head / EE SVCE.



Dr.R.Anitha Professor & Head / CS, SVCE introduced the Chief Guest of the function Dr.Vaidehi Vijayakumar Vice Chancellor, Mother Teresa Women's University, Kodaikanal.



The Valedictory Address was given by Dr.Vaidehi Vijayakumar with a brief note about smart technologies, smart charging electric vehicles, also discussed various ideas on improving the grid efficiency, AI and IoT.

## BEST PAPER AWARDS LIST:

S.NO	PAPER ID	TITLE OF THE PAPER/AUTHOR
1	STEP21116	<b><i>Influence of fuel contaminants on Performance of PEM Fuel Cell</i></b> Dr.N Nachiappan, Dr. S. Ananda Babu, Sanjaiy .N, Vijayan A Sabarinathan G M
2	STEP21078	<b><i>Operational Cost Optimization in Micro Grid using Spider Monkey Optimization</i></b> V. Pramila, Dr. S. Chandramohan, Dr. C. N. Ravi
3	STEP21070	<b><i>Accident Prediction &amp; Analysis using machine learning</i></b> Mohammed Thowfiq S, Saija S, Om Vignesh K, Sharon Femi P
4	STEP21114	<b><i>A keystroke Framework for specific explorations in MOOCs</i></b> Nisha R S, Radha R
5	STEP21129	<b><i>Frequency Ancillary Support by VSWECS in Deregulated Environment</i></b> Mr.S.Kumaravel
6	STEP21027	<b><i>Optimized Portable Beverage Maker with Voice Recognition, Fruit Classification, Battery Efficiency with Qahe and Automated Dry-Cleaning Mechanism</i></b> P. Arul, P. Aaron Jerin Roger, VS. Gowtham , R. Gurucharan

7	STEP21044	<b>Smart Intelligent System Based on Solar Power</b> D. Amudhavalli, RM. Alagu kavery , D. Mythili
8	STEP21082	<b>Autism Detection Intelligence using AI</b> Shravan Srinivasan, Vaishali M, Vedith.R , Meenakshi.P.
9	STEP21113	<b>Thermographic Analysis of Photovoltaic Quasi Z- Source Multilevel Inverter</b> Dr.D.Umarani, Dr. R.Seyezhai
10	STEP21024	<b>Design And Control Of New Modified Cascaded H Bridge Multilevel Inverter</b> Augustin A, Dr. R. Karthikeyan, Dr. T. Annamalai
11	STEP21107	<b>Device Modeling of ZnO Based Mosfet Using Consul Multiphysics</b> M.Sasikala, Mr.S.Sudharsanam , Dr.K.B.Sudhakar



**EDITORIAL TEAM FOR**  
**STEP 2021**

**Dr. KR. Santha**  
Professor & Head

**Dr. Sudhakar K Bharatan**  
Professor

**Dr. C.Gopinath**  
Associate Professor

**Ms. S. Sinthamani**  
Assistant Professor

# CERTIFICATE FOR THE PARTICIPANTS

STEP 2021

   **Sri Venkateswara College of Engineering**  
Autonomous - Affiliated to Anna University  
Pennalur, Sriperumbudur, Tamil Nadu | [www.svce.ac.in](http://www.svce.ac.in) 

PAPER ID : STEP 21015 **The Certificate of Appreciation**

This is to certify that  
**Dr / Mr / Ms. ARULMOZHI S**  
of  
**SRI VENKATESWARA COLLEGE OF ENGINEERING**  
has attended and presented a paper entitled  
**Design and Analysis of Non Isolated Multi Input Multi Output Dc-Dc Converters for Electric Vehicle Applications**  
in the AICTE sponsored International E- Conference on "Smart Technologies in Electric Vehicles and Power Grid (STEP-2021)"  
Organised by Sri Venkateswara College of Engineering, Pennalur on 27<sup>th</sup> - 29<sup>th</sup> January, 2021.

  
Dr. K R. Santha  
Vice Principal, Prof & Head / EEE  
Co-ordinator

  
Prof. Dr. S Ganesh Vaidyanathan  
Principal

Top Ranked Affiliated Institution in Tamil Nadu    5/5 Star Rated Innovation Cell    Top Performer    Recognized Incubation Center    Certified Organization    Accreditations