



Sri Venkateswara
College of
Engineering

ASSOCIATION OF ELECTRICAL AND ELECTRONICS
ENGINEERS

PRESENTS A

TECHNICAL MAGAZINE

ON

**TECHNOLOGY DEVELOPMENT
OF E-VEHICLES**



28-5-2020

TO

30-5-2020

MESSAGE FROM CONVENER



I am very glad that the International Workshop on Technology Development of E-Vehicles, has shaped into a three day event that provides a common platform to bring diversified researchers in the field of Electric Vehicle, Smart Battery Management, Device Modeling, Smart Technologies in EV. This international workshop 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 workshop from 28 th to 30th may, 2020. We hope that the interactions in the E-vehicle workshop will have a positive impact on the realization of technology development of E vehicle 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 international workshop on Technology Development in E-vehicle.

Dr. KR. Santha
Vice-Principal,
Professor and Head , EEE
Convener

CO-ORDINATORS



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Assistant Professor

Expert Speaker Details



Mr. Ganesh Nagarajan
Director & Country Manager,
ePropelled Systems Pvt Ltd
Email: ganesh@epropelled.com

Topic: Fundamentals EV Technology & EV Architecture

Date: 28-05-2020 (Session 1)

Topic: EV Traction Motor Design Process & Consideration

Date: 28-05-2020 (Session 2)

Bachelor of Engineering	Electrical & Electronics Engineering, SCSVMV University, Kanchipuram, India (2004)
Master of Engineering	Power Electronics & Drives, SVCE, Anna University, Chennai (2007)
Experience	14 + years of Experience in the Field of Electric Motor Design, Analysis & prototype of special electric machine's in ePropelled system's PVT Ltd.
Earlier organization	Renault Nissan Business Centre India Pvt Ltd, Mahindra REVA, Comstar automotive.
Publications and Patent	3 International Conferences Paper, 2 Journal Paper & 3 Patents



Dr. A. Deepak,
Electromagnetic Design Engineer
ePropelled Systems Pvt Ltd
deepaka@epropelled.com

Topic: Importance of FEA Tools in Electrical Design.
Date: 29-5-2020

Bachelor of Engineering	Thirumalai Engineering college, Kanchipuram 2006
Master of Engineering and Doctrate	CEG, Anna university Chennai in 2009. He completed his PhD degree in Anna university 2017
Experience	13 years of teaching experience , currently Electromagnetic design engineer for the ePropelled team, He published more than 12 research papers in various reputed journals like Elsevier & Springer publishers .
Area of Interest	His area of interest is finite element analysis of special electrical machines & application of power electronics in electrical drives



Mr. Harish K
Lead - Power Electronics Software
ePropelled Systems Pvt Ltd

Topic: xEV's : Configurations & Controls.

Date: 29-5-2020

Bachelor of Engineering	Vignan's Lara Institute of Science (2011)
Master of Engineering	Power Electronics & Drives from VIT, Vellore(2014)
Experience	Lead Power Electronics Software for the ePropelled team, earlier in M&M in the Advanced technology group. He has worked on multiple projects which range from prototyping to production level software. His work includes the development of controls & software for xEV's & UAV's
Area of Interest	His primary research interests include Sensorless control, LQR control in propulsion control units for Automotive & Aerospace domains.



Satyam Panchal- Ph.D., P.Eng.,
Adjunct Professor,
Department of Mechanical and Mechatronics
Engineering,
University of Waterloo, 200 University Avenue West,
Waterloo, Ontario, Canada, N2L 3G1,
Office: E5-3017, Phone: +1-519-888-4567-Ext 31605
Email: satyam.panchal@uwaterloo.ca

Topic: Fundamentals of Lithium-ion battery and Electric Vehicle Modeling

Date: 30-05-2020

Dr. Satyam currently works as "Adjunct Professor" in the Department of Mechanical and Mechatronics Engineering at University of Waterloo (UW), Ontario, Canada. His research area is thermal management of lithium-ion batteries for electric vehicles (EVs) and hybrid electric vehicles (HEVs). He is currently working a project called "Battery life cycle management for Ford Escape PHEV and EV" and the project is supported by Transport Canada. He is also actively working on the research area of "lithium-ion battery thermal, degradation, electrochemical, and CFD modeling. For battery pack testing and modeling, he also worked at Green and Intelligent Automotive (GAIA) lab at Univ. of Waterloo. He has published more than 25 refereed articles in highly reputable international journals. He is also a member of Professional Engineers Ontario (PEO) in Canada since 2016. Additionally, Dr. Panchal is also an excellent teacher and won 5 awards in consecutive years for teaching excellence at Univ. of Waterloo.

SCHEDULE

Day-1
Session-1

*Fundamentals of EV
Technology & EV
Architecture*



Day-1
Session-2

*EV Traction Motor
Design Process &
Consideration*



Day-2
Session-3

*xEV's -
Configurations &
Controls*



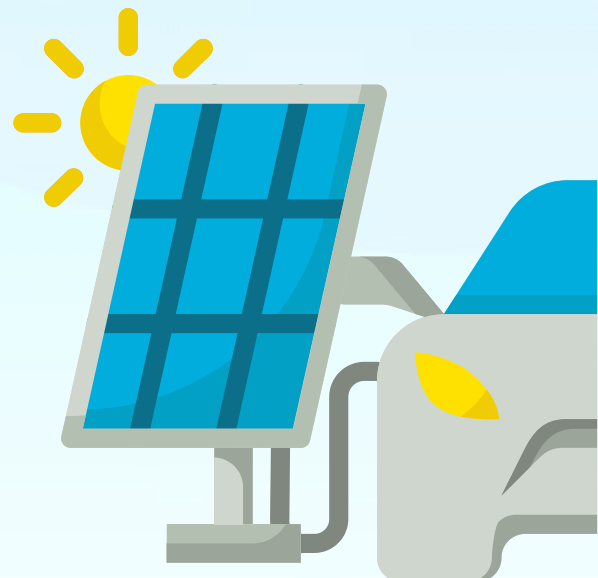
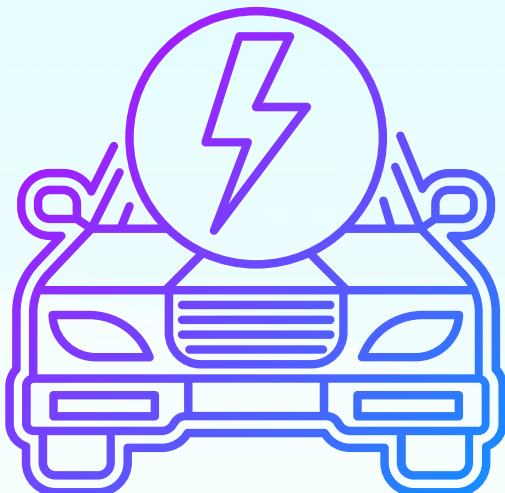
Day-2
Session-4

*Importance of FEA
Tools in Electrical
Design*



Day-3
Session-5

*Fundamentals of
Lithium- battery and
Electric Vehicle
Modeling*



ABOUT THE PROGRAM

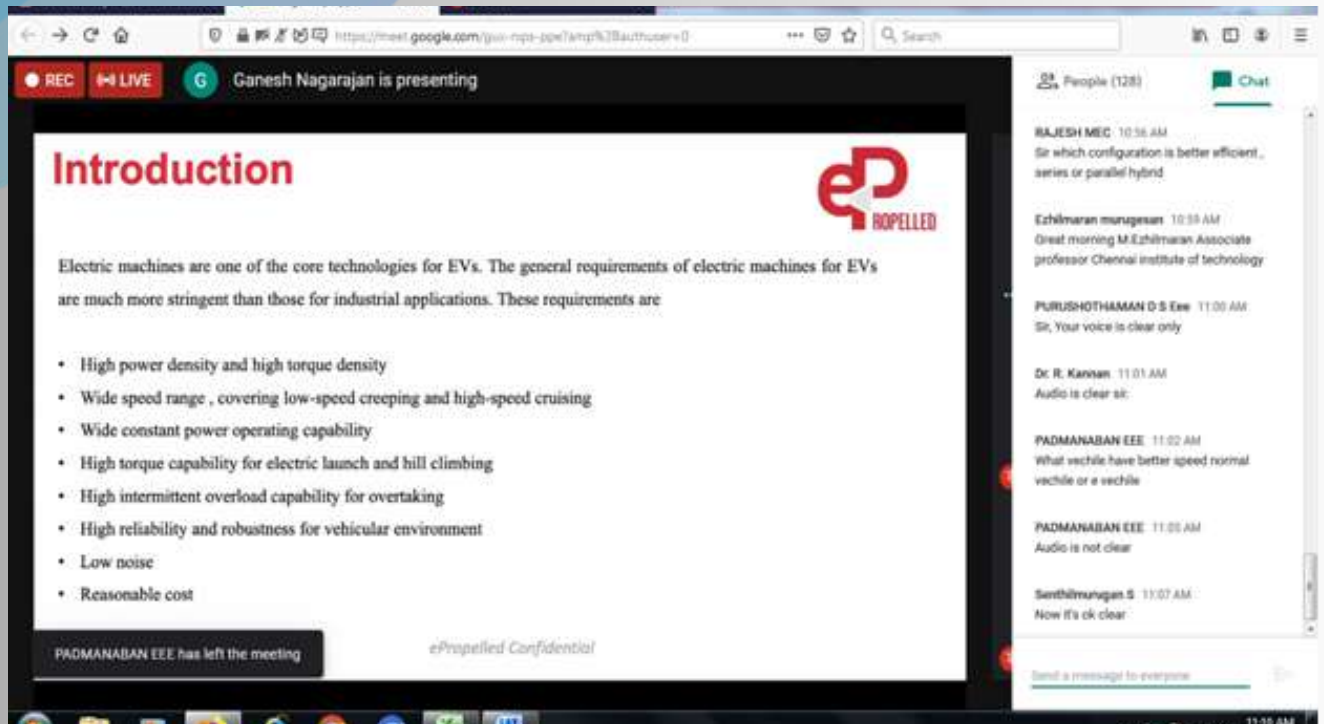
The EEE department of Sri Venkateswara College of Engineering organized three days online international workshop on "Technology Development of E-Vehicles" from 28 - 30 May 2020. Faculties, research scholars and students of various engineering colleges and SVCE registered for this event. Nearly 300 participants registered for this event. The main focus of the workshop was to impart knowledge on the fundamentals and architecture of E-vehicles, selection of motor, battery and control aspects in E-vehicle technology. The sessions were organised in online using Google Meet and also were live streamed for the benefits of faculty and students of EEE.

The workshop commenced with a welcome address to the expert and participants and the objectives and importance of the workshop was explained. Dr.KR. Santha, Vice Principal, Professor and Head of the Department-EEE addressed the gathering with importance of the workshop. Dr.KR Santha further introduced the topic of the lecture to the participants by sharing her views and made the participants aware of the scope in future.



DAY 1 -28TH MAY

SESSION-1



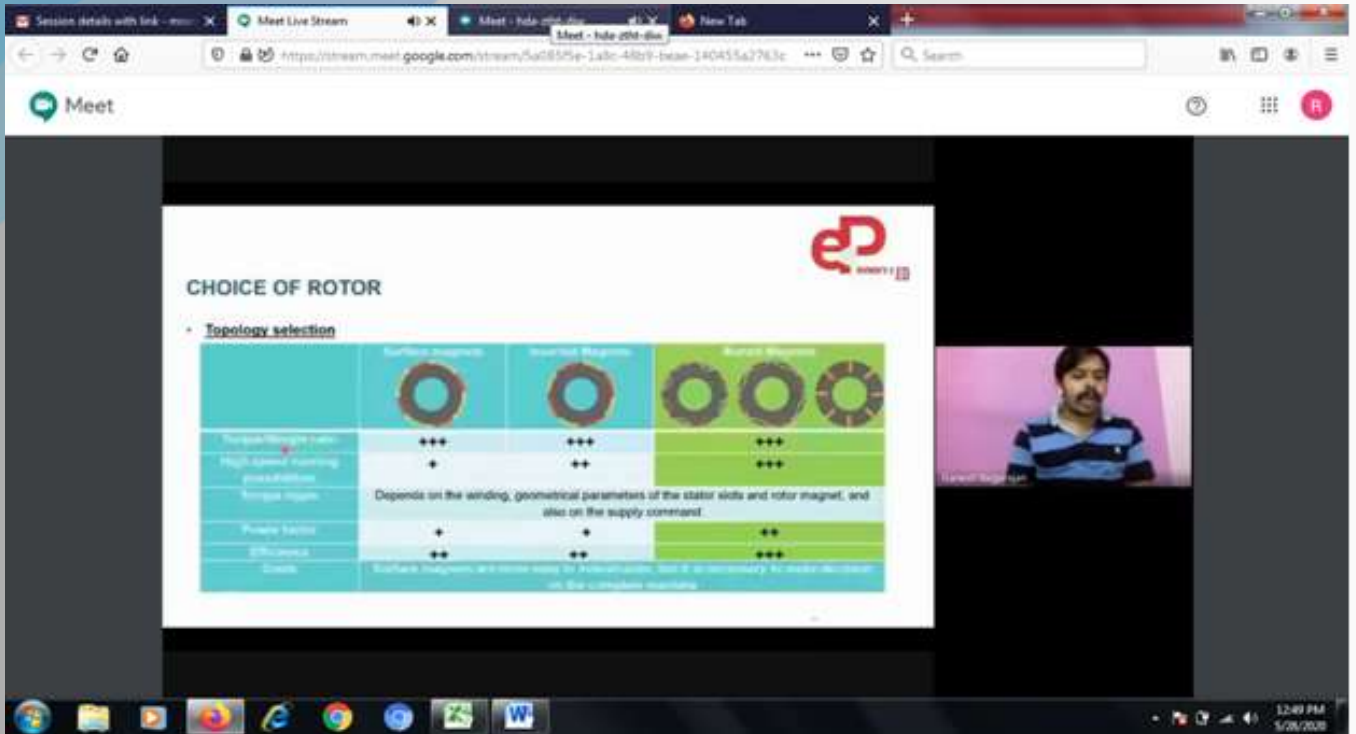
The lecture for the first session of day 1 was delivered by Mr. Ganesh Nagarajan, Director, ePropelled Systems Pvt. Ltd. The topic was Fundamentals of EV Technology & EV Architecture.

Nearly 208 participants attended online session and about 80 students joined the live stream session.

The Speaker started the presentation with the brief history of electric Vehicle. Architecture of electric and hybrid electric Vehicle was discussed in detail. Also, different types of electric motors used in EV and the characteristics expected from them for EV application were discussed.

DAY 1 -28TH MAY

SESSION-2

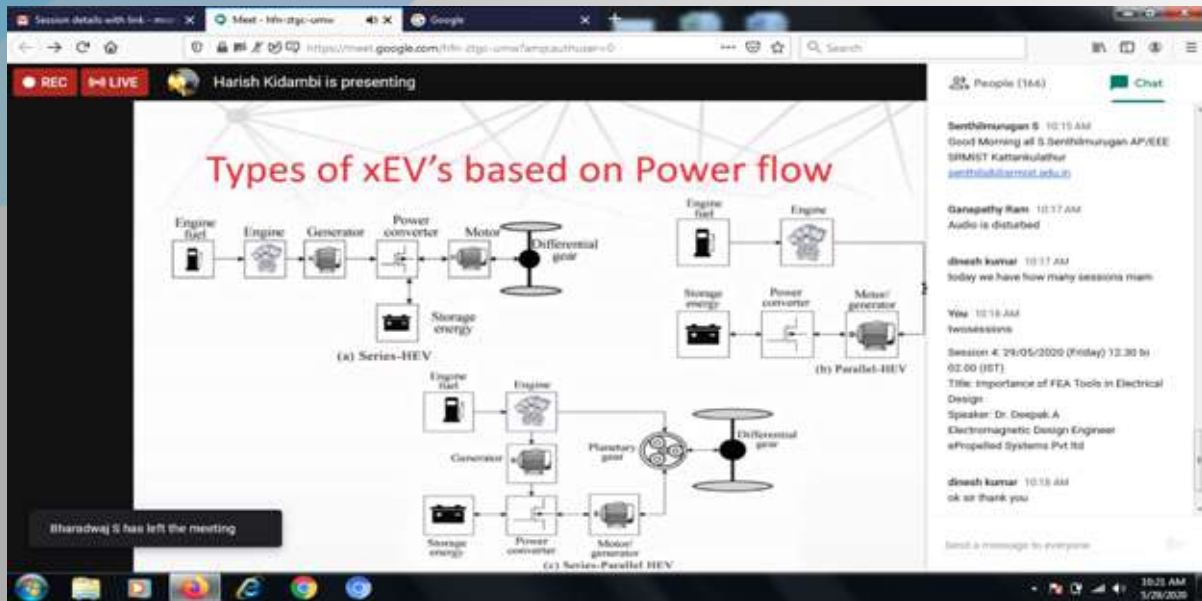


Mr Ganesh continued his presentation in the session 2 on the same day titled EV Traction Motor Design Process & Consideration. The presentation dealt with the design process involved in electric motor such as cooling methods applied for electric motors and losses in various types of motors. He also touched upon the thermal analysis approach and design process flow of electric motor.



DAY 2 -29TH MAY

SESSION-3



On Day 2 Session 3, Mr. Harish K, Lead Engineer - Power Electronics Software division, ePropelled Systems Pvt. Ltd. He spoke on xEV's - Configurations & Controls.

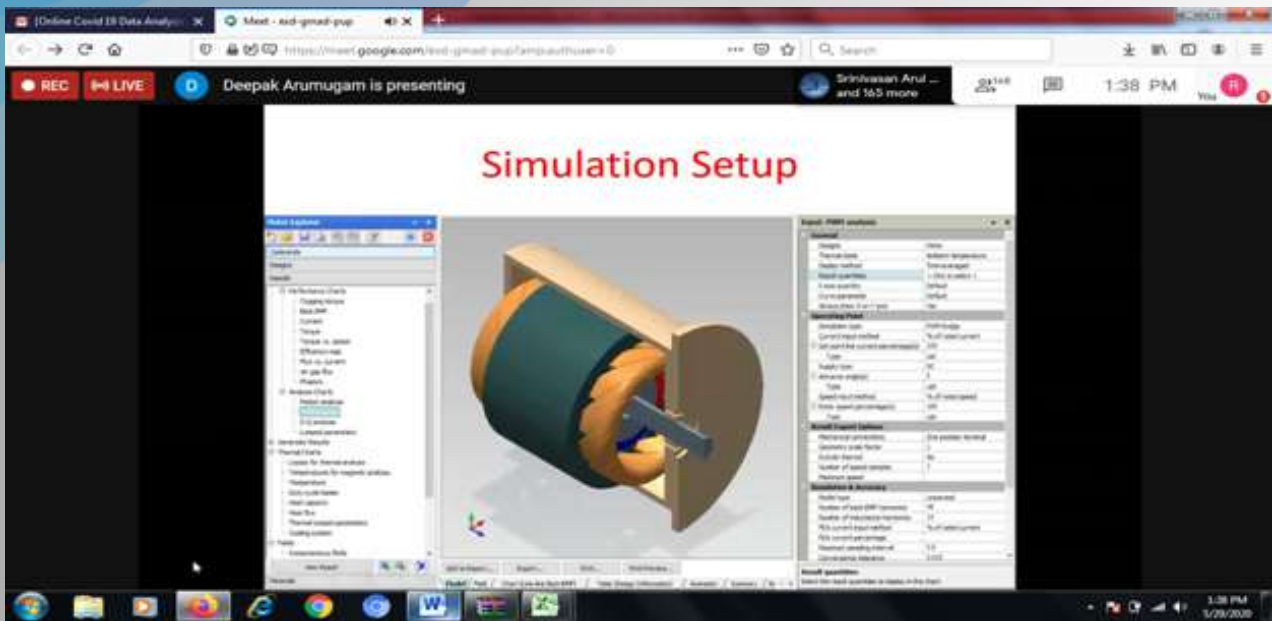
Nearly 196 participants attended online session and about 80 students joined the live stream session. Mr. Harish explained about concept of hybrid power drain, different xEV's configuration (based on power flow and motor position).

The different configurations of EV based on power flow, Motor position and power have been dealt in this session. He focused on the Low level and High-level power application control strategies in EV technology. MATLAB and other model-based design platforms for EV has also been dealt in detail.



DAY 2 -29TH MAY

SESSION-4



On Day 2 session 4 Dr. A. Deepak, Electromagnetic Design Engineer, ePropelled Systems Pvt. Ltd., Chennai , delivered a lecture on Importance of FEA Tools in Electrical Design who threw light upon the machine design requirements in E-Vehicle applications. Nearly 176 participants attended online session and about 80 students joined the live stream session Dr. Deepak highlighted on the various software tools used for machine design and also gave a demonstration on "Motor Solve" software for simple machine modeling. In addition, he briefly explained the various job and research opportunities in the field of machine design in future and motivated the participants.



DAY 3 -30TH MAY

SESSION-5



The international speaker Dr Satyam Panchal, Ph.D., P. Eng., Adjunct Professor, University of Waterloo, Canada threw further light upon the topic "Fundamentals of Lithium-ion battery and Electric Vehicle Modeling" during session 5 of Day 3.

Nearly 211 participants attended online session and about 80 students joined the live stream session.

This presentation dealt with the manufacturing process of Li- ion battery and challenges involved in the integration EV. Energy and Cost analysis of battery with EV was highlighted. Various EV modeling parameters and different battery models was explained in this session.



OUTCOME

The vast majority of faculty and student participants participated actively by posting their questions and all doubts were cleared by the dignitaries and they also offered support for projects. Each and every session were highly informative, and lot of practical inputs were given along with a strong message about the importance of innovative outputs.



Editorial Team



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