ITEC is aimed at helping the industry transition from conventional vehicles to advanced electrified vehicles.



2013 IEEE Transportation Electrification Conference and Expo (ITEC'13)

Components, Systems, and Power Electronics - From Technology to Business and Public Policy



June 16-19, 2013

Adoba Hotel Dearborn/Detroit (Former Hyatt Regency) Dearborn, Michigan, USA











Welcome Message from General Chair



It is my utmost pleasure to welcome you to the 2013 IEEE Transportation Electrification Conference and Expo (ITEC'13). ITEC is aimed at helping the industry in the transition from conventional vehicles to advanced electrified vehicles. The conference is focused on components, systems, standards, and grid interface technologies, related to efficient power conversion for all types of electrified transportation, including electric vehicles, hybrid electric vehicles, and plug-in hybrid electric vehicles (EVs, HEVs, and PHEVs) as well as heavyduty, rail, and off-road vehicles and airplanes and ships.

The ITEC'13 organizing committee has been working wholeheartedly to compose this excellent technical conference for you. Thanks to their dedication and countless hours of work as well as ITEC's strategic and business plan and leadership of IEEE Power Electronics Society, Industry Applications Society, and Power & Energy Society, ITEC has quickly become the main global technical event for transportation electrification.

We have an excellent conference planned for you to experience, with a comprehensive program exceptionally attractive to industry, government agencies, and general public, in addition to the academic researchers, students, and educators. ITEC includes an Educational EV/HEV Boot Camp with two parallel short courses offered by internationally renowned industry experts. In addition, we have world-class plenary speakers covering current status and future trends in transportation electrification. The program will also include state-of-the-art tutorials and numerous panel discussions, as well as over 100 high-quality technical paper presentations. Furthermore, this year, ITEC includes a track, sponsored by the Department of Energy's electric drive vehicle engineering program known as E3- Electrifying the Economy - Educating the Workforce: *Taking Charge of the Electric Vehicle Industry's Educational Needs*.

We are passionately looking forward to meeting you at ITEC'13, wish you the heartfelt welcome to ITEC'13, and hope that you have a memorable experience. If you are not part of the broader organizing community of ITEC and would like to be directly involved with the conference, we welcome you to join forces with us in improving ITEC and addressing the needs of the industry—after all ITEC is your conference.

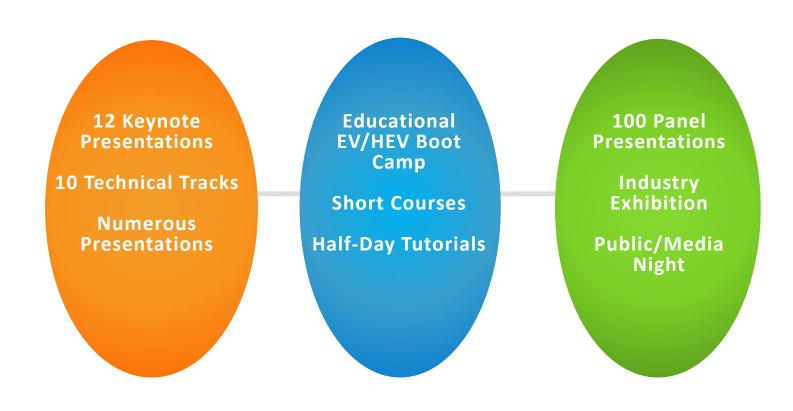
Warmest Regards,

Alireza Khaligh

General Chair, ITEC'13

You will experience...

ITEC is focused on components, systems, standards, and grid interface technologies, related to efficient power conversion for all types of electrified transportation, including electric vehicles, hybrid electric vehicles, and plug-in hybrid electric vehicles (EVs, HEVs, and PHEVs) as well as heavy-duty, rail, off-road vehicles, airplanes and ships.



We have features for every step of the way...



IT'S ABOUT THE KNOWLEDGE SHARED...

Deepak Divan

President and CTO VARENTEC, INC.

Jay Iyengar

Vice President, Aerospace Engineering & Technology EATON CORPORATION

Robert Chin

Group Manager in Electrical
Machines and Motion Control
ABB CORPORATE RESEARCH

Connie Bezanson

Technology Manager, Office of Vehicle Technologies **DEPARTMENT OF ENERGY**

Martin Dober

Senior Vice President
MICHIGAN ECONOMIC
DEVELOPMENT

Pam Wylie

Technology Planning Manager FORD MOTOR COMPANY

Juergen Wiesenberger

Director

CONTINENTAL AUTOMOTIVE

Noel R. Mack

Group Director, Driveline, Transmission & Hybrid Electric Systems RICARDO, INC.

Zilal Zhao

Director of Global Product Management MAGNA ELECTRONICS

Michael Harpster

Director of Propulsion Systems Research Lab GENERAL MOTORS

Martin Dober

Senior Vice President
MICHIGAN ECONOMIC
DEVELOPMENT

Rupert Stuetzle

Chief Technology Officer **UBITRICITY**

It's About Collaboration

All conference registrants are welcome to attend the panel discussions, which are in parallel with technical sessions, at no additional charge.

Panels are expected to be 80 minutes in duration and are scheduled in the afternoons of Monday (June 17, 2013) and Tuesday (June 18, 2013) as well as morning of Wednesday (June 19, 2013).

At each panel, the panel moderator/organizer and panelists will each give a short 10-15 minute presentation/speech and then open the floor to the audience for an open panel discussion and O&A.

Panel 1 Automotive Technology Roadmap

Panel 2

Game Changing Technologies in Power Conversion for Electrification of Vehicles (Air, Sea, Ground)

Panel 3

Educational Programs on Transportation Electrification: Current Status and Future Needs

Panel 4
Wireless Charging

Panel 5
Wide Bandgap Devices

Panel 6

Economy and Workforce Development of Electric Vehicle Industry

Panel 7
Rare Earth Free Magnet Material

Panel 8 Chargers

Panel 9

The Evolution of Heavy Duty Vehicle Integrated Electronics Systems

Panel 10

Aerospace Applications – More Electric Aircraft

Panel 11

IEVC Forum: Innovating The Transportation Landscape Via Advanced Vehicle-To-Infrastructure Connectivity

Panel 12

Role of Entrepreneurship in Transportation Electrification Opportunities/Challenges

Panel 13

Energy Storage Systems

Panels 14

Transportation Electrification Standards Roundtable

General Chair

Alireza Khaligh, University of Maryland at College Park

General Co-Chairs

Burak Ozpineci, Oak Ridge National Laboratory, USA Bulent Sarlioglu, University of Wisconsin-Madison, USA

Program Chair

Mahesh Krishnamurthy, Illinois Institute of Technology, USA

Program Co-Chair

Anand Sathyan, Chrysler Group LLC, USA

Assistant Program Chair

Narayan C. Kar, University of Windsor, Canada

IEEE TAB/FDC Electric Vehicle Committee Co-Chairs and IEEE Transportation Electrification Initiative Chairs

Russell Lefevre, 2008 President, IEEE-USA Lee Stogner, 2010-2011 Director, IEEE Board of Directors

IAS Representatives

Burak Ozpineci, Oak Ridge National Laboratory Ayman El-Refaie, GE Avoki Omekanda, GM Mohammad Islam, Nexteer Automotive

PES Representatives

Paul Bishop, Secretary of IEEE P2030.1 Guide for Electric-Sourced Transportation Infrastructure Abdel-Aty Edris, Quanta Technology

Publications Chair

Omer C. Onar, Oak Ridge National Laboratory, USA

Registration Chair

Berker Bilgin, MacAUTO, McMaster University, Canada

Education Chair

Marshall Molen, Mississippi State University, USA

Awards Chair

John Shen, Illinois Institute of Technology, USA

Technical Chair for Electric Machines

Hossein Dadkhah, Chrysler LLC

IEEE Southeastern Michigan Section Liaison Chair, Kevin Taylor

Automotive Industry Liaison Chairs

Suresh Gopalakrishnan, GM Michael Degner, Ford Hong Yang, Chrysler LLC

Commercial Vehicle Industry Liaison Chair

William Batten, Oshkosh Corporation

Rail Vehicle Industry Liaison Chair

Tim Richter, GE Global Research

Off-Road Vehicle Industry Liaison Chairs

Nader Nasr, Oshkosh Corporation Long Wu, John Deere

Aerospace Industry Liaison Chairs

Waleed Said, Hamilton Sundstrand Kamiar Karimi, The Boeing Company Nick Nagel, Triumph Aerospace Sayeed Mir, Eaton Aerospace

Naval/Ship Industry Liaison Chair

Uday Deshpande, General Atomics

Battery Industry Liaison Chair

Said Al-Hallaj, All Cell Technologies

Technical Track Chairs and Co-Chairs

Track 1: Power Electronics and Electric Motor Drives

Chair: Fariborz Musavi, Delta-q Technologies Corp, Canada

Co-Chair: Zhong Nie, Chrysler LLC, USA

Track 2: Electric Machines and Actuators

Chair: Narayan C. Kar, University of Windsor, Canada

Co-Chair: Xiaodong Shi, Mercedes-Benz, USA

Track 3: Battery and Battery Management

Chair: Elias Ayana, Cummins Power Generation, USA Co-Chair: Ganga Jayaraman, Woodward MPC, Inc, USA

Track 4: Electric, Hybrid Electric, and Plug-in Hybrid Electric Vehicle System Architectures

Chair: Sheldon Willimason, Concordia University, Canada

Co-Chair: Shuai Lu, Chongqing University, China

Track 5: Smart Grid, Electrical Infrastructure, and V2G

Chair: Srdjan Lukic, North Carolina State University, USA

Co-Chair: Richard Scholer, Chrysler LLC, USA

Track 6: Electrification of Heavy-Duty and Off-Road Vehicles

Chair: Jin Wang, Ohio State University, USA

Co-Chair: Amin Hasanzadeh, Florida State University, USA

Track 7: Fuel Cells and Applications in Transportation

Chair: Omer C. Onar, Oak Ridge National Laboratory, USA

Co-Chair: Berker Bilgin, MacAUTO, Canada

Track 8: Electrical Systems and Components for Sea, Undersea, Air, and Space Vehicles

Chair: Babak Nahid-Mobarakeh, University of Lorraine, France

Co-Chair: Chris Edrington, Florida State University, USA

Track 9: Modeling, Simulation, and Control

Chair: Ali Davoudi, University of Texas at Arlington, USA

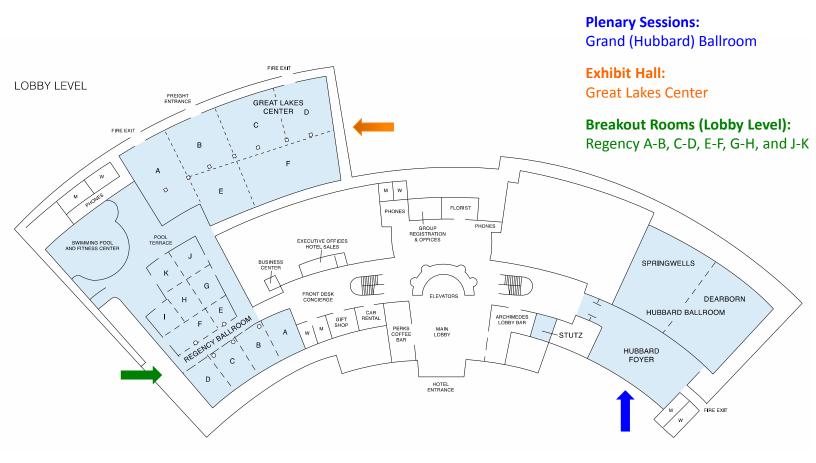
Co-Chair: Ilse Cervantes, Institute for Scientific and Technological Research of San Luis

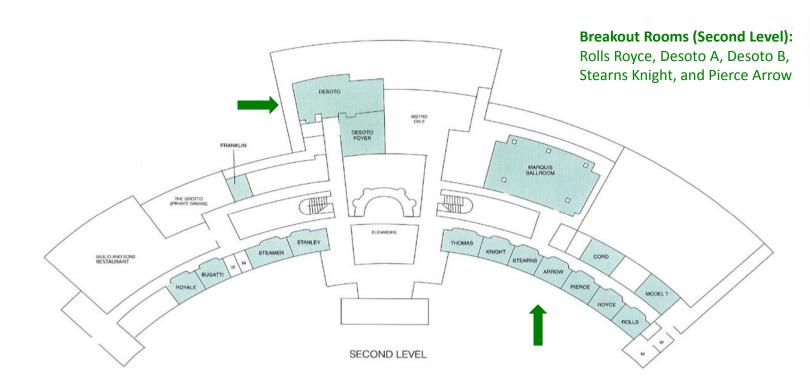
Potosi, Mexico

Track 10: Standards, Policies, and Regulations for Transportation Electrification

Chair: Sanjaka G. Wirasingha, Chrysler LLC, USA Co-Chair: Baiming Shao, Mercedes-Benz, USA

Meeting Room Floor Plan





Program-at-a-Glance

	7:30AM- 8:30AM	8:30AM- 10:05AM	10:20AM-	10:20AM- 12:00PM	12:00PM- 2:00PM	2:00PM- 3:20PM	3:20PM- 4:20PM	4:20PM- 5:40PM	5:40PM- 7:30PM
Sunday June 16, 2013		Educational Educational EV/HEV Boot Camp		Educational Educational EV/HEV Boot Camp	Lunch (on own)	Educational Educational EV/HEV Boot Camp	llsH tidi	Educational EV/HEV Boot EV/Camp	
Monday June 17, 2013	egistration	Plenary Session 1	e Break	Plenary Session 1	Poster Session 1 Exhibit Hall Buffet Lunch	Tutorial 1 Session 1 Panel 1 Panel 2 Panel 3	reak at Exh	Tutorial 1 Session 2 Panel 4 Panel 5	Public/ Media Night in Exhibit Hall
Tuesday June 18, 2013	nference R	Plenary Session 2	эӊоЭ	Plenary Session 2	Poster Session 2 Exhibit Hall Buffet Lunch	Session 3 Session 4 Panel 7 Panel 8	S offee B	Session 5 Session 6 Panel 9 Panel 10	Conference Social Event in Exhibit Hall
Wednesday June 19, 2013	0)	Tutorial 2 Session 7 Session 8 Panel 12		Tutorial 2 Session 9 Panel 13 Panel 14	EXI	Exhibit Hall Open:)pen: , 17 th 12.0		7.30 PM

Monday, June 17th, 12:00 Noon – 7:30 PM Tuesday, June 18th, 12:00 Noon – 7:30 PM

Sunday, June 16, 2013 Educational EV/HEV Boot Camp



ITEC's Educational EV/HEV Boot Camp includes four half-day long short courses, which are scheduled for Sunday, June 16, 2013. These short courses are offered by industry leaders and are suitable for industry managers and engineers as well as researchers and students. The morning sessions will start at 8:30 AM and conclude at 12:00 noon, with a 30-minute break from 10:10 AM until 10:40 AM. The afternoon sessions will start at 2:00 PM and conclude at 5:30 PM with a 30-minute break from 3:30 PM until 4:00 PM.

Short Course 1: Wireless Power Transfer (WPT) Systems

Sunday, June 16, 2013 8:30 AM – 12:00 Noon

Venue: Regency A-B



Instructors: Dr. John Miller and Dr. Omer Onar, Oak Ridge National Laboratory

Short Course Description: Wireless power transfer (WPT) is a convenient, safe, and autonomous means for charging electric and plug-in hybrid electric vehicles. This tutorial covers the essentials of magnetic resonance coupling and relevant aspects of WPT operation, an analytical approach to calculate the coupling coefficient of WPT, a control strategy based on grid-side power converter regulation, to optimize overall system performance, as well as modeling and simulation of WPT along with some experimental results obtained from the Oak Ridge National Laboratory. Experimental studies performed at the Oak Ridge National Laboratory covers the stationary and in-motion wireless power system operation results, performance of different coil designs, system characteristics under different switching frequencies, load clamping voltage, DC link voltage, high frequency inverter duty cycle, coil spacing, misalignment, foreign obstacles between the coils, insertion loss due to road surfacing materials, and the step-down transformer at the inverter input for increased inverter efficiency.

Instructors Short Biographies: Dr. John M. Miller is an IEEE and SAE fellow. Dr. Miller is the director of the Power Electronics and Electrical Power Systems Research Center and the manager of the Advanced Power Electronics and Electric Motors Program at the Oak Ridge National Laboratory. He has authored over 190 publications and holds 54 U.S. patents. Dr. Miller is the recipient of various awards and recognitions. Dr. Omer C. Onar is an R&D staff and Alvin M. Weinberg Fellow at the Power Electronics and Electric Machinery Group at the Oak Ridge National Laboratory. He is the recipient of the 2008–2009 Transportation Electronics Fellowship from the IEEE Vehicular Technology Society and the 2009 Joseph J. Suozzi INTELEC® Fellowship from the IEEE Power Electronics Society. He is the principle author/coauthor of over 45 journal and conference papers.

Sunday, June 16, 2013 Educational EV/HEV Boot Camp

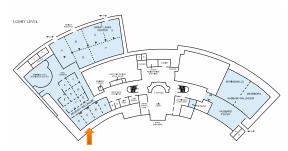


Short Course 2: Power Electronics Thermal Packaging and Reliability

Sunday, June 16, 2013

8:30 AM - 12:00 PM Venue: Regency C-D

Instructors: Dr. Patrick McCluskey¹ and Dr. Avram Bar-Cohen^{1,2}
¹University of Maryland, ²Defense Advanced Projects Agency
(DARPA)



Short Course Description: Power electronics are the critical enabling technology for electrified transportation. Their widespread incorporation has resulted in significant improvements in efficiency over previous technologies, but it also has made it essential that the reliability of power electronics be characterized and enhanced. Recently, increased power levels, made possible by new compound semiconductor materials, combined with increased packaging density have led to higher heat densities in power electronic systems, especially inside the switching module, making thermal management more critical to performance and reliability of power electronics. Following a review of heat transfer principles and thermal management techniques, along with prognostic health management approaches to assess and ensure reliability, this short course will present the latest developments in the packaging, assembly, and thermal management of power electronic modules and systems, along with modeling and testing techniques. This course will emphasize thermal management techniques capable of addressing the reliability concerns associated with increased power levels, power density, and temperature in power electronic components.

Instructors Short Biographies: Dr. Patrick McCluskey is an Associate Professor of Mechanical Engineering at the University of Maryland, College Park, where he conducts research in the Center for Advanced Life Cycle Engineering (CALCE) in the areas of thermal management, reliability, and packaging of electronic microsystems for use in extreme temperature environments and high power applications. Dr. McCluskey has published more than 100 refereed technical articles on these subjects, and has edited three books. He is an associate editor of the IEEE Transactions on Components, Packaging, and Manufacturing Technology. Dr. McCluskey is a fellow of the International Microelectronics and Packaging Society (IMAPS).

Dr. Avram Bar-Cohen is an internationally recognized leader in the development and application of thermal science and engineering to microelectronic and optoelectronic systems. In his role at the Defense Advanced Projects Agency (DARPA) and through his professional service in IEEE and ASME, he has helped to define and guide the field of thermal packaging. He is the sitting President of the Assembly for International Heat Transfer Conferences, an Honorary member of ASME, and Fellow of IEEE, as well as Distinguished University Professor in the Department of Mechanical Engineering at the University of Maryland. Dr. Bar-Cohen is a recipient of numerous awards and recognitions. He has co-edited 16 books, authored/co-authored some 400 technical papers, delivered 65 keynote, plenary and invited lectures, and holds 8 US and 3 Japanese patents.

Sunday, June 16, 2013 Educational EV/HEV Boot Camp



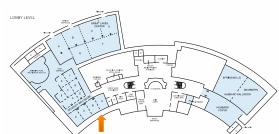
Short Course 3: Overview of Power Electronics Product Development Cycle and Fundamentals of Charger Design

Sunday, June 16, 2013 2:00 PM – 5:30 PM

Venue: Regency C-D

Instructors: Dr. Fariborz Musavi and Dr. Deepak S. Gautam

Delta-Q Technologies Corp.



Short Course Description: This seminar covers fundamental aspects of single stage versus two stage topologies in battery charging applications from characteristics of subsystems to component level requirements. The first part of the presentation will cover topics on topology selection, semiconductor and passive components selection and feedback control considerations for battery charging application. Charger operating strategies and controls are explained in the light of meeting transient and regulatory requirements. Technical details about charger performance, protections, and use of various simulation packages will also be covered. The second half of the seminar will emphasize on a practical product development cycle for designing an industrial and automotive battery charger. Thermal management techniques along with mechanical packaging considerations for design for manufacturability (DFM) will also be discussed. Some of the most common design and analysis techniques like DFMEA and WCCA will also be presented with examples. A typical test setup for testing a battery charger performance in the lab will be presented along with details for selecting some of the commonly used test and measuring test equipment. Examples from some of current product models are used to explain the current state of art of battery chargers. Potentials and challenges of industrial and automotive battery charging are also discussed.

Instructors Short Biographies: Dr. Fariborz Musavi has been with several high-tech companies including EMS Technologies Inc., Montreal, QC, Canada, DRS Pivotal Power, Bedford, NS, Canada and Alpha Technologies, Bellingham, WA, USA. Currently he is with Delta-Q Technologies Corp., Burnaby, BC, Canada, where he works as Manager of Research, Engineering and is engaged in research on simulation, analysis, and design of battery chargers for industrial and automotive applications. His current research interests include high power, high efficiency converter topologies, high power factor rectifiers, electric vehicles, and sustainable and renewable energy sources. Dr. Musavi is the recipient of the 2011 First Prize Paper Award from the IEEE Industry Applications Society.

Deepak S. Gautam is currently working for Delta-Q Technologies Corp., Burnaby, BC, Canada as a Power Electronics Engineer where his main responsibility is to develop high frequency switch-mode battery chargers for automotive and industrial application. His research interests are dc-dc and acdc converters, resonant converters and feedback control circuits. Mr. Gautam is the recipient of the University of Victoria fellowship, Andy Farquharson award for excellence in graduate student teaching and a best poster presentation award at the APEC 2012.

Sunday, June 16, 2013 Educational EV/HEV Boot Camp



Short Course 4: Design and Optimization of Traction Motors with ACE+ Suite

Sunday, June 16, 2013

2:00 PM - 5:30 PM

Venue: Regency A-B



Instructors: Kunal Jain and Emmanuel Bot, ESI Group

Short Course Description: The development of a low-cost, high-performance interior permanent magnet (IPM) traction motor is essential to large-scale commercialization of Electric Vehicles. The traction motor not only drives the propulsion of the vehicle but also recharges the battery through regenerative braking. Additionally, the motors must operate consistently under extreme hot and cold temperatures along with varied road conditions. The key design barriers include the need of higher operating temperatures, increased energy density, durability, and reduced weight. The design and optimization process of the motors must help engineers address the above barriers. These challenges can be addressed in a systematic fashion with ACE+ Suite. ACE+ Suite is an ideal engineering design and analysis tool used by over 400 organizations worldwide because of its strong advanced CFD/Multiphysics capabilities. ACE+ Suite couples CFD, Electromagnetics, Structural, and Plasma solutions with each other. In the first half of the tutorial, an overview of electromagnetic capabilities of ACE+ Suite will be provided. Topics covered will include fundamentals of electromagnetics, losses in permanent magnets, eddy currents, skin effects. Subsequently, multiphysics phenomena such as Joule heating, Inductive Heating will be discussed. In addition, using CFD to perform parametric analysis and optimization studies will be addressed. In the second half, a few sample problems will be explained and solved on the concepts covered in the first half. The participants will leave the seminar ready to explore the world of multiphysics in design and optimization of traction motors.

Instructors Short Biographies: Kunal Jain is the Product Manager for ACE+ Suite. Prior to that, he was a lead developer of CFD-ACE+ solver with a strong focus on Fuel Cells. Emmanuel Bot is the Lead Applications Engineer focusing on Automotive Applications with ACE+ Suite. Prior to that, Emmanuel was a Support Engineer providing support to ACE+ suite customers worldwide.

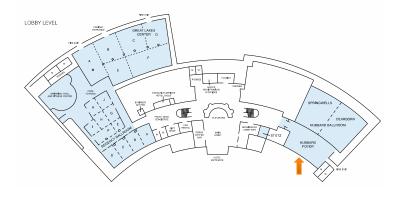


Plenary Session 1

Monday, June 17, 2013 8:30 AM – 12:00 Noon

Venue: Grand (Hubbard) Ballroom

Chair: Dr. Ali Emadi, McMaster University



Welcome and Introduction

8:30 AM - 8:35 AM

Dr. Alireza Khaligh, General Chair, 2013 IEEE Transportation Electrification Conference and Expo Dr. Dong Tan, President, IEEE Power Electronics Society

Keynote Presentation 1: Integrating Distributed Energy Resources and Electric Vehicles 8:35 AM – 9:05 AM

Speaker: Dr. Deepak Divan, President and CTO, Varentec, Inc.

Short Biography: Deepak Divan is President and CTO of Varentec, a company funded by green-tech venture capital firm Khosla Ventures that is providing innovative solutions to achieve a smart and dynamically controllable grid. He has over 35 years of experience in industry and academia in the areas of power electronics applied to utility and industrial systems. Deepak is a Fellow of the IEEE, past President of the IEEE Power Electronics Society, and has been requested to speak at dozens of conferences and symposiums on topics related to next generation power electronics to emerging solutions for dynamic grid control. From 2004-2011, he served as Professor in Electrical and Computer Engineering and Founding Director of the Intelligent Power Infrastructure Consortium at the Georgia Institute of Technology in Atlanta. Previously, Dr. Divan was a Professor in Electrical Engineering at the University of Wisconsin – Madison. He has over 250 papers and 40 issued and pending patents. Recently, Deepak spoke on a keynote panel at the ARPA-E Summit in Washington DC, on the topic "Future Grid: Beyond Smart Meters". Dr. Divan combines unique perspectives on the changing landscape on the Transmission & Distribution grid, and the need for a transition to dynamic grid control, including advanced power electronics solutions. His research interests are in dynamic grid control, sustainable energy and advanced power electronics.

Keynote Presentation 2: Clean Transportation: In The Air and On The Roads 9:05 AM – 9:35 AM

Speaker: Jay Iyengar, Vice President, Aerospace Engineering & Technology, Eaton Corporation

Short Biography: Jay Iyengar has over 23 years of professional experience in complex propulsion systems & components in the transportation segment, covering both Automotive and Aerospace industries. Her current responsibilities include leading global Aerospace engineering & technology organization for Eaton Aerospace Group, a leaders of Aerospace Hydraulic, Fuel & Electrical power management. She received a M.S. degree in Mechanical Engineering from Wayne State University; a M.S. degree in Mechanical Engineering from Indian Institute of Technology, Bombay, India; and a B.S. degree in Mechanical Engineering from Mysore University, India.

Keynote Presentation 3: Two Sides Of The Same Coin" – Competitiveness Edges Via a Balanced Act In Research and Development

9:35 AM - 10:05 AM

Speaker: Dr. Robert Chin, ABB Corporate Research

Short Biography: Robert Chin is the Group Manager in Electrical Machines and Motion Control at ABB Corporate Research Centre in Scandinavia. He is leading corporate technology development activities in areas of electrical motors, generators and drive control, in connection to various ABB business units. He was the recipient of Cape Town Cooperation Silver Gilt Medal in 1998 and Mandel Cambridge Bursary in 1999. He is the Chairman of IEEE Industry Application Society (IAS) Sweden Chapter. Robert holds a doctoral degree in electrical engineering with a specialization in electrical machines.

Coffee Break

10:05 AM - 10:20 AM

DOE E3 Welcome Messages

10:20 AM - 10:30 AM

Welcome message from the Senator Debbie Stabenow, U.S. Senator for Michigan Farshad Fotouhi, Dean, College of Engineering, Wayne State University Jean Redfield, President and CEO, NextEnergy

Keynote Presentation 4: An Overview of DOE Activities and Efforts on Transportation Electrification

10:30 AM - 11:00 AM

Speaker: Connie Bezanson, Technology Manager, Office of Vehicle Technologies, Department of Energy

Short Biography: Connie Bezanson serves as the technology manager for education and outreach at the Office of Vehicle Technologies within the U.S. Department of Energy. She manages the Graduate Automotive Technology Education, Advanced Vehicle Competition, and the Electric Drive Education activities funded by the Recovery Act. She received a B.S. in Mechanical Engineering from The Catholic University of America. Connie Bezanson has experience managing several advanced vehicle competitions including EcoCAR and Challenge X and serves as the DOE manager responsible for collaborations with the Automotive X Prize.

Keynote Presentation 5: Michigan and the Electric Vehicle Industry

11:00 AM - 11:30 AM

Speaker: Martin Dober, Senior Vice President, Michigan Economic Development Corporation

Short Biography: Martin Dober is senior vice president of entrepreneurship and innovation for the Michigan Economic Development Corporation (MEDC). In this role, he leads a team focused on delivering programs that encourage entrepreneurship and innovation across business sectors, and directs all programs under the state's 21st Century Jobs Fund – a \$1 billion, ten-year initiative to transform Michigan's economy. This includes managing a \$100 Million portfolio of direct investments into early stage companies; and \$80 Million of recent investments into the infrastructure to support entrepreneurs around the state – including pre-seed capital programs, business incubator and accelerator support, statewide business plan competitions, university technology transfer initiatives, and other support services for start-up companies. Before joining the MEDC, Dober held senior-level business development positions in several small technology companies, including iRobot Corporation, American Systems Technology, Inc., and EIP, Inc. His career also includes experience in mergers & acquisitions at Delphi, corporate finance at Chrysler, and engineering at the Budd Company.

Keynote Presentation 6: Roadmap towards a Sustainable Electric Vehicle Market 11:30 AM – 12:00 Noon

Speaker: Pam Wylie and Lois Miller, Managers, Electrification Business Strategy, Ford Motor Company

Short Biography: Lois Miller and Pam Wylie are Ford Motor Company's managers of Global Electrification Business Strategy. Appointed to this position April 2012 as long-time job share partners, Lois & Pam lead the strategy and planning for the next generation of Ford's global electric vehicle portfolio, touching all aspects of electrified transportation. Prior to taking their current role, Lois & Pam have held several key management positions within the Ford Product Strategy and Planning organization, including manager of the North America Cycle Plan, manager of Global Technology Planning and manager of Small Car Planning & Strategy. Prior to their planning roles, Lois & Pam held several positions within Product Development, including Chassis Product Design, Program Management, Quality and Product Launch experiences. Lois first joined Ford in 1990 in Explorer Quality and Pam joined Ford in 1992 in Advanced Engineering. Lois received her bachelor's degree in Electrical Engineering from Bucknell University and completed advanced studies in Business Administration at Central Michigan University. Pam received her bachelor's degree in Mechanical Engineering from the University of Michigan and her master's degree in Mechanical Engineering and master's degree in Business Administration from the University of Michigan.

HALF-DAY TUTORIALS

ITEC conference registrants are welcome to attend the tutorials at no additional charge. Tutorials are expected to be three hours in duration and are scheduled in parallel with the conference sessions. The afternoon tutorials will start at 2:00 PM and conclude at 5:40 PM with an hour break from 3:20 PM until 4:20 PM. The morning tutorial will start at 8:30 AM and conclude at 12:00 noon, with a 30-minute break from 10:10 AM until 10:40 AM. These tutorials are offered by technical leaders and are suitable for industry managers and engineers as well as researchers and students.

Tutorial 1: Energy Storage for BEVs: An Engineering Perspective

Monday, June 17, 2013

2:00 PM - 5:40 PM

Venue: Regency A-B

Speakers: Mr. Ashish Arora and Dr. John Martens, Exponent

Engineering and Scientific Consulting



Tutorial Description: Energy storage for HEVs and EVs is making a transition to the Lithium ion-based chemistries due to the advantages of relatively lower cost and weight and higher energy density and reliability. Various design topologies and comprehensive battery management systems are implemented to manage the battery system and ensure proper operation. As such, a system level approach to designing the battery system is used to ensure that the required safety features operate as intended and provide adequate safety, reliability and performance. This tutorial will cover topics including: General battery system requirements for HEVs and EVs, Introduction to the lithium-ion technology and its operation, A comparison of battery chemistries for BEVs, Steps involved in the manufacture of Lithium ion cells, Techniques used for the characterization and evaluation of battery performance, Typical design topologies and battery management architectures employed for small and large format lithium-ion batteries, Control circuit topologies used to mitigate the safety concerns typically associated with Lithium-ion batteries, Typical tests performed on battery systems and the approach taken by industry standards to evaluate the safety and reliability of batteries used in both HEVs and EVs.

Speakers Short Biographies: Ashish Arora is a Principal Engineer in Exponent's Electrical and Computer Engineering practice. Mr. Arora specializes in electrical and electronic systems particularly in power converter and rechargeable battery technology design and safety evaluation. Dr. John D. Martens is a Principal Engineer in Exponent's Electrical Engineering and Computer Science practice. He specializes in control systems and software, microprocessor-based and computer systems, circuit design and analysis, electronic components failure analysis, and consumer products design and failure analysis.

Poster Session 1

Poster Session 1: Power Electronics, Motor Drives, and Vehicular Applications **Session Chairs:** Dr. Avoki M. Omekanda, Staff Research Engineer, General Motors - Global R&D Center Dr. Emad Dlala, Application Engineer – Ansys Inc. Monday, June 17, 2013 12:00 PM - 2:00 PM Venue: Great Lakes Center (Exhibit Hall) PS-1 A Simplified Power Loss Calculation Method for PFC Boost Topologies Fariborz Musavi¹, Wilson Eberle² and William G. Dunford² ¹Delta-Q Technologies Corp., Canada, ²The University of British Columbia, Canada PS-2 A Novel Highly Efficient Tank-Less Inverter for Transportation Applications Abhinava Chaitanya Moreddy and Venkataraman Aditya Nanyang Technological University, Singapore PS-3 Neutral-Point Voltage Balancing of Three-Level Inverter Using Modified Carrier-Based Space Vector Modulation and THD Comparison with the Two-Level Inverter Lekha Sejpal¹, Luiz Lopes¹, Amar Mohammed² and Sheldon Williamson¹ ¹Concordia University, Canada, ²TM4 Inc., Canada PS-4 Analysis and Design of Dual Clamp Current Fed DC-DC Converter for a 28V Li-Ion Electric Accumulator Parampreet Kaur Toor¹, Ali Emadi¹ and Hassan A. Kojori² ¹McMaster University, Canada, ²Honeywell Aerospace, Canada PS-5 Analysis and Design of a High Voltage Electric Accumulator Abdul Lateef¹, Ali Emadi¹ and Hassan Kojori² ¹McMaster University, Canada, ²Honeywell Aerospace, Canada PS-6 **Design Considerations for Wireless Electric Vehicle Charging** Matthew Bloom, Geng Niu and Mahesh Krishnamurthy Illinois Institute of Technology, USA PS-8 Integrated DC/DC **Fuel** Multiple Input Converters Supervisory Control for Cell/Battery/Ultracapacitor Electric Vehicle Seyoung Kim and Sheldon Williamson Concordia University, Canada PS-9 An Electro-Thermal Cycle-Lifetime Estimation Model for LiFePO4 Batteries Junyi Shen, Serkan Dusmez, and Alireza Khaligh University of Maryland at College Park, USA **PS-10** Study of Permanent Magnet Machine Based Flywheel Energy Storage System for Peaking Power Series **Hybrid Vehicle Control Strategy** Xiaomin Lu, Lakshmi Varaha Iyer, Kaushik Mukherjee and Narayan Kar University of Windsor, Canada

17

Poster Session 1

PS-11	Hybrid Energy Storage System (HESS) in Vehicular Applications: A Review On Interfacing Battery And Ultra-capacitor Units Amir Ostadi and Mehrdad Kazerani University of Waterloo, Canada
PS-12	Fault Sensitive Modeling and Diagnosis of PEM Fuel Cell for Automotive Applications Ali Mohammadi ¹ , David Bouquain ¹ , Deatrice Bouriot ¹ , Abdesslem Djerdir ¹ and Davood Khaburi ² ¹ Universite de Technologie de Belfort-Montbeliard, France, ² University of Science and Technology, Iran
PS-13	Pulse Charger with Zero Current Switching and Isolation for Electric Vehicles and Renewable Energy Applications Sunil Abeyratne ¹ , Parami Wijesinghe ¹ and Chamika Liyanagedera ² ¹ University of Peradeniya, Sri Lanka, ² Purdue University, USA
PS-14	Review and Comparison of Inductive Charging Circuit Topologies for Electric and Hybrid Electric Vehicles Bernardo Peschiera and Sheldon Williamson Concordia University, Canada
PS-15	Wavelet-Transform Based Energy and Power Decoupling Strategy for an Ultracapacitor-Battery Hybrid Power-Split Gear Powertrain Serkan Dusmez and Alireza Khaligh University of Maryland at College Park, USA
PS-16	Study of the Electric Power Balance in a Vehicle for the Choice of the Battery Gianmarco Capano, Maurizio Mozzone and Narayan Kar University of Windsor, Canada
PS-17	Extended Kalman Filter Based Battery State Of Charge (SOC) Estimation for Electric Vehicles Chenguang Jiang, Allan Taylor, Chen Duan and Kevin (Hua) Bai Kettering University, USA
PS-18	Study of Misalignment for On Road Charging Venugopal Prasanth and Pavol Bauer Delft University of Technology, Netherlands
PS-19	SOC Estimation for Aged Lithium-Ion Batteries Using Model Adaptive Extended Kalman Filter Saeed Sepasi, Reza Ghorbani and Bor Yann Liaw University of Hawaii at Manoa, USA
PS-20	Simulation Analysis of a Pitch Trim Actuator Ganga Jayaraman and Zenon Szulyk Woodward Inc., USA
PS-21	A Comprehensive Review of Power Electronic Converter Topologies to Integrate Photovoltaics (PV), AC Grid, and Electric Vehicles Nina Naghizadeh and Sheldon Williamson Concordia University, Canada
PS-22	Brushless Wound-Rotor [Synchronous] Doubly-Fed Machine only By Brushless Real-time Control Frederick Klatt Best Electric Machine, USA

17

Poster Session 1

PS-23	Electrical Bearing Damage A Lurking Problem in Inverter-Driven AC Traction Motors Adam Willwerth and Matthew Roman Electro Static Technology, USA
PS-24	Space Vector Based Field Oriented Control of Permanent Magnet Synchronous Motor with a 3-Level Scheme Pinkymol Harikrishna Raj, Ali Iftekhar Maswood and Aditya Venkataraman Nanyang Technological University, Singapore
PS-25	System Identification for Fault Diagnosis of Permanent Magnet Machines Dusan Progovac, Le Yi Wang and George Yin Wayne State University, USA
PS-26	Optimal Design Considerations for Interior Permanent Magnet Motor for a Range-Extended Electric Vehicle Yong Jiang, Zhi Yang and Mahesh Krishnamurthy Illinois Institute of Technology, USA
PS-27	Poly-Phase Motor Drives Under Fault and Normal Conditions: Application for a Five-Phase Induction Motor Salem Alloune University of Bejaia, Algeria
PS-28	Regenerative Braking of Battery-Powered Converter-Controlled PM Synchronous Machines Aravind Samba Murthy and David Taylor Georgia Institute of Technology, USA

	Technical Session 1: Power Electronics- I Session Chairs: Dr. Chandra Namuduri, Technical Fellow – General Motors R&D Center Elias Aymana, Cummins Generation
	Monday, June 17, 2013 2:00 PM — 3:20 PM Venue: Regency J-K
S1-1	Analysis and Optimization of Buffer Circuits in High Current Gate Drive Yang Xue, Zhiqiang Wang, Leon Tolbert and Benjamin Blalock University of Tennessee, USA
\$1-2	Comprehensive Topological Analyses of Isolated Resonant Converters in PEV Battery Charging Applications Haoyu Wang and Alireza Khaligh University of Maryland at College Park, USA
S1-3	Wide Bandgap Device Characteristics for Hybrid Electric Vehicle Applications Ranbir Singh, GeneSic Semiconductor Inc., USA
S1-4	A Comparative Evaluation of Control Techniques for Grid-Side AC-DC Converter in a Two-Stage Level- two Bidirectional Battery Charger Noreen Wong, Kun Zhuge and Mehrdad Kazerani University of Waterloo, Canada

	Technical Session 2: Advances in Transportation (Industry Presentation-Only session) Session Chairs: John Gibson, Chief Engineer – Chrysler Group LLC Silva Hiti, Technical Fellow – General Motors
	Monday, June 17, 2013 4:20 PM – 5:40 PM Venue: Regency J-K
S2-1	Hybrid Power Electronics Development Challenges to VDA specifications Brian Peaslee Magna Electronics, USA
S2-2	Advanced Solutions and Optimization for Electric Machines Emad Dlala Ansys Inc., USA
S2-3	Inverters for HEV/PHEV/BEV Steven Kowalec Continental Corporation, USA
S2-4	Magnet Options for Traction Motor Applications Steve Constantinides Arnold Magnetics, USA

Panel 1: Automotive Technology Roadmap

Monday, June 17, 20123

2:00 PM - 3:20 PM

Venue: Regency C-D

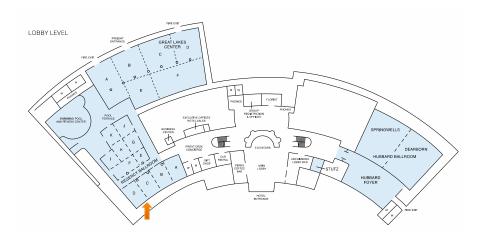
Panel Moderator: Dr. Ali Emadi, Canada Excellence Research Chair in Hybrid Powertrain and

Director of MacAUTO, McMaster University

Panelists:

Mengyang Zhang, Senior Technical Specialist, Chrysler Group LLC
Haoran Hu, Chief Scientist, Eaton Corporation
Bob Storc, Robert Storc Consulting LLC
Scott Heywood, Engineering Group Manager, Energy Balance and Strategy Group, GM
Mark Jennings, Technical Leader, Electrified Propulsion Systems Research & Advanced Engineering,
Ford Motor Company

Panel Summary: This panel discusses a technology roadmap (short term and long term) for the automotive industry by focusing on advanced vehicle technologies that are expected to be widely adopted by the industry in the coming decades. Panelists will present their own view of the current status and future trends and answer questions including: What are the major technical challenges facing the industry? How cost-effective are various advanced vehicle technologies including electrified powertrains, advanced engines, and lightweight materials? What are the advantages and disadvantages of various powertrain technologies? What are the most promising solutions to improve fuel economy, reduce emissions, and enhance safety and performance? What are the most cost-effective technologies to address the new and emerging requirements including the North American 2025 CAFÉ Standards? What's the role of electro-mechanical powertrain integration? How do we improve sustainability in transportation? What technical breakthroughs are needed?



Panel 2: Game Changing Technologies in Power Conversion for Electrification of Vehicles (Air, Sea, Ground)

Monday, June 17, 2013

2:00 PM - 3:20 PM

Venue: Regency E-F

Panel Organizer and Moderator: Dr. Bulent Sarlioglu, Assistant Professor and Associate Director of WEMPEC, University of Wisconsin–Madison

Panelists:

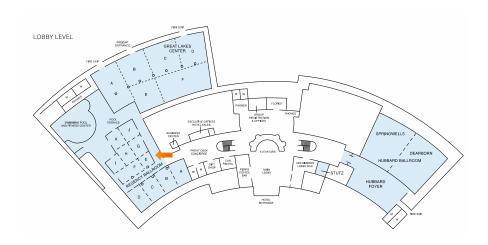
Dr. Saeid Habibi, Senior NSERC Industrial Research Chair, McMaster University

Dr. Bulent Sarlioglu, University of Wisconsin–Madison

Dr. John Miller, Oak Ridge National Laboratory

Dr. Robert Chin, ABB Corporate Research

Panel Summary: This panel is for discussing the transformative and incremental technologies from the perspective of electrical and electro-mechanical power conversion for electrification of all vehicles. Panel intends to highlights synergies and contrasts among electrification of various vehicles including more electric airplanes, electric vehicles, and ships. The panel intends to facilitate information exchange and discussion about new power system architectures and new game changing technologies such as wide bandgap devices for power electronics and integrated drive systems using high-speed electric machines. The panel will draw attendees from aerospace, automotive and marine OEMs (Tier 1 and Tier 2), and researchers from the field.



Panel 3: E3 Panel: Educational Programs on Transportation Electrification: Current Status and Future Needs

Monday, June 17, 2013 2:00 PM – 3:20 PM

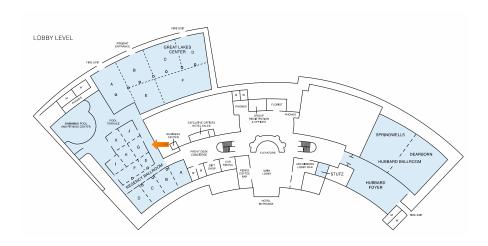
Venue: Regency G-H

Panel Moderator: Jerry Ku and Steve Salley, Wayne State University

Panelists:

Gary Caille, Colorado State University
James Gover, Kettering University
Jeffrey Naber, Michigan Technology University
Don Siegel, University of Michigan
Angela Rolufs, Director, Missouri University of Science and Technology
Steven O. Salley, Wayne State University
Jerry Ku, Wayne State University

Panel Summary: This panel will discuss the status of programs and courses developed with support by the Department of Energy for the advancement of electric drive vehicle engineering educational programs. Panelists will discuss recent progress of their programs, including enrollment and student demand, student placement and employment, student survey results and other outcome measures. They will also assess the need for additional courses and curricular changes in the area of transportation electrification.



Panel 4: Wireless Charging

Monday, June 17, 2013

4:20 PM - 5:40 PM

Venue: Regency C-D

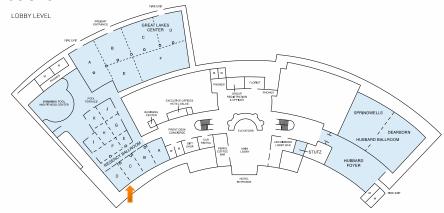
Panel Moderator: Dr. John Miller, Oak Ridge National Laboratory

Panel Organizers: Dr. John Miller and Dr. Omer C. Onar, Oak Ridge National Laboratory

Panelists:

Rebecca Hough, Co-Founder & CEO, Evatran David Schatz, VP, WiTricity (or Katie Hall, WiTricity) Andrew Daga, CEO, Momentum Dynamics Jeff Muhs, Utah State University Grzegorz Ombach, VP of Engineering, Qualcomm

Panel Summary: Wireless power transfer (WPT) is a convenient, safe, and autonomous mean for electric and plug-in hybrid electric vehicle charging that has seen rapid growth in recent years for stationary applications. WPT does not require bulky contacts, plugs, and wires, is not affected by dirt or weather conditions, and is as efficient as conventional charging systems. When applied inmotion, WPT additionally relives range anxiety, adds further convenience, reduces battery size, and may help increase the battery life through charge sustaining approach. In the 1990's there were isolated cases of inductive charging and other non-contacting means proposed, but it was not until the mid-2000's when DOE took interest, then in 2008 investigated evanescent wave power transfer, that private industry escalated their activities. This panel session covers the insights from leading industry executives and researchers, wireless charging and EV public policy, issues and challenges of vehicle and infrastructure integration, synergies and interactions between roads and vehicles, recent technological advancements, emerging standards, and the broader deployment considerations.



Panel 5: Wide Bandgap Devices

Monday, June 17, 2013

4:20 PM - 5:40 PM

Venue: Regency E-F

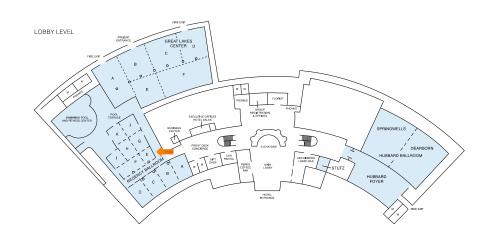
Panel Moderator: Patrick McCluskey, University of Maryland and Burak Ozpineci, Oak Ridge

National Laboratory

Panelists:

David Grider, Power Program Manager, Cree, Inc.
Madhu Sudhan Chinthavali, Oak Ridge National Laboratory
Ranbir Singh, GeneSiC Semiconductor
Karim S. Boutros, HRL Laboratories LLC
Benjamin Blalock, University of Tennessee

Panel Summary: Over the last 20 years, a revolution has occurred in the generation, distribution, and use of power, as power electronics have replaced hydraulic, pneumatic and other traditional control methods. This has occurred as a result of the smaller size and weight, higher efficiency (lower losses), and higher reliability of these solid-state power electronic switching systems. This revolution is now being extended via the incorporation of wide bandgap semiconductor devices in power electronic systems in place of silicon devices. These wide bandgap semiconductors promise even higher efficiency, faster switching, higher breakdown strength, higher thermal conductivity, and higher temperature operation. However, there are still issues related to material quality, device reliability, high temperature packaging, and thermal management of these wide bandgap power systems. We have assembled a panel of experts to address these issues standing in the way of widespread incorporation of wideband gap devices in power electronics.



Panel 6: E3 Panel: Economy and Workforce Development of Electric Vehicle Industry

Monday, June 17, 2013 4:20 PM – 5:40 PM

Venue: Regency G-H

Panel Moderator: CP Yeh¹ and Doug Fertuck², ¹Wayne State University, ²Macomb County

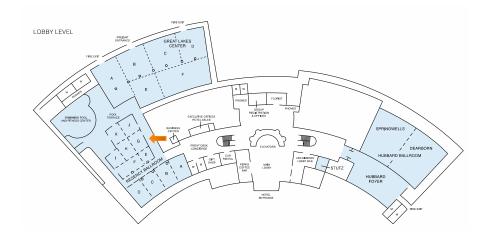
Community College

Panelists:

Douglas Fertuck, Macomb Community College, Associate Director of Center for Advanced Automotive Technology (CAAT)

Robert Feldmaier, Macomb Community College, Director of CAAT CP Yeh, Wayne State University, Chair of the Division of Engineering Technology Gene Liao, Wayne State University, WSU, Director of BS-ETT Program Randall Champagne, GM, co-President of MAGMA Gregory Moss, Denso, co-President of MAGMA

Panel Summary: The panel will address the following topics: engaging industry in curriculum development in electrified vehicle technology; the impact of future fuel economy improvement technologies on needed workforce skills (for technicians and engineers); strategies for upgrading skills of current employees; and the partnering of OEMs, suppliers, and academia to provide the necessary flow of skilled workers into the auto industry.



Monday, June 17, 2013 Technical Committee Meeting

Joint PELS/IAS Technical Committee Meeting

Monday, June 17, 2013

6:30 PM - 8:00 PM

Venue: Regency C-D

Agenda

ITEC Strategic Plan, Vision, Progress Report, and 3-Year Plan

6:30 PM - 7:00 PM

ITEC Steering Committee Chair: Ali Emadi, McMaster University

Annual Committee Meeting of the IEEE Power Electronics Society (PELS) Technical Committee (TC) on Vehicle and Transportation Systems

7:00 PM - 7:30 PM

TC Chair: Ali Emadi, McMaster University

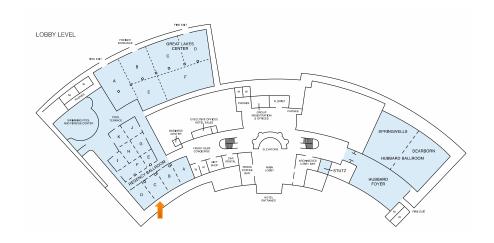
Committee Meeting of the IEEE Industry Applications Society (IAS) Transportation Systems Committee

7:30 PM - 8:00 PM

TC Chair: Iqbal Husain, North Carolina State University

This meeting is open to all conference attendees and will discuss the activities of the technical committees of PELS and IAS related to vehicle and transportation systems, including ITEC.

Please attend this joint meeting if you are interested in getting more involved with the activities of IEEE-PELS and/or IEEE-IAS (e.g., ITEC, other conferences, workshops, publications, awards, etc.).



Tuesday, June 18, 2013

Keynote Presentations

Plenary Session 2

Tuesday, June 19, 2012 8:30 AM – 12:00 Noon

Venue: Grand (Hubbard) Ballroom

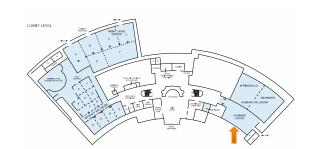
Chair: Dr. Silva Hiti, General Motors

Co-Chair: Dr. Babak Fahimi, University of Texas at Dallas



8:30 AM - 8:35 AM

Dr. Blake Lloyd, President, IEEE Industry Applications Society



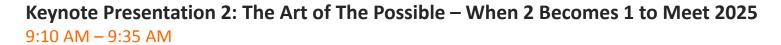
Keynote Presentation 1: Tailored to Fit: Customized degree of Powertrain Electrification Solutions

8:35 AM - 9:05 AM

Speaker: Speaker: Juergen Wiesenberger, Director of Continental Automotive

Short Biography: Juergen Wiesenberger is the Director for Continental's Hybrid Electrical Vehicles (HEV) Business Unit in North America. He has worked in the Automotive Industry for more than 25 years with expertise in Powertrain Control Systems and components. Wiesenberger began his career with Continental (Siemens Automotive in Germany) in 1987 and transferred to Auburn Hills, Michigan in 1994. Previously, Wiesenberger held the company's Director positions for Gasoline systems in Auburn Hill and Newport News, Va and Diesel systems in and Columbia, SC. overseeing globally all aspects of the Control systems and associated components for all US based customers. Wiesenberger earned a Mechanical Engineering degree from the Technical School in Landshut, Germany and an Electrical Engineering degree from the University of Regensburg, Germany.

Tuesday, June 18, 2013 Keynote Presentations



Speaker: Noel R. Mack, Product Group Director, Driveline, Transmission & Hybrid Electric Systems, Ricardo, Inc.

Short Biography: Noel Mack holds a bachelor of science in mechanical and aeronautical engineering and masters in engineering management. Noel is currently the Product Group Director for Driveline, Transmission and Hybrid Electric Systems for Ricardo Inc. Since his first position in 1985 as a project engineer in aeronautics and systems technology, he spent over a decade in aerospace before joining the automotive industry. He worked for Magna International for 13 years prior to joining Ricardo. Formerly, Noel was also an Adjunct Professor at the University of Detroit Mercy, where he taught a course in Hybrid Electric Vehicle Performance and Design.

Keynote Presentation 3: Hybrid/Electric Vehicle Power Electronics from Technology to Business to Public Policy

9:35 AM - 10:05 AM

Speaker: Zilai Zhao, Director, Global Product Manager, Power Electronics and Motors, Magna Electronics

Short Biography: Zilai Zhao is currently the Director of Global Product Management, responsible for Power Electronics and Motors, at Magna Electronics. Mr. Zhao has a Bachelor's degree from Tsinghua University, an MSEE degree from the University of California – Los Angeles and an MBA degree from the University of Michigan – Ann Arbor. Mr. Zhao has been working on vehicle electrification since late 90's, first as controls engineer and later moving into various engineering and business leadership roles. The 2012 Ford Focus Electric uses inverter and electric motor designed and produced by Mr. Zhao's team in Magna.

Coffee Break

10:05 AM - 10:25 AM

Tuesday, June 18, 2013 Keynote Presentations

Welcome from IEEE PES

10:25 AM - 10:30 AM

Dr. Noel Schulz, President, IEEE Power & Energy Society

Keynote Presentation 4: A Report of EVs in High-Utility Service

10:30 AM - 11:00 AM

Speaker: Micheal Austin, Vice President, BYD America

Short Biography: Micheal Austin received his degree in Design Engineering and completed a Masters in Mechanical Engineering from BYU. He worked for Motorola 15 years in functions including ODM Director for the Mobile Devices Business responsible for over \$3B in purchases annually and serving as Motorola's Global Energy Commodity Manager purchasing Motorola's battery products. He was selected as Motorola's Distinguished Innovator (with 22 US patents) in 1999. He has considerable Asian International business experience which proves invaluable in his current role as Vice President for BYD America. BYD is a \$40B Chinese company listed on the HKE and has over 200,000 employees.

Keynote Presentation 5: Opportunities and Challenges in Propulsion Electrification 11:00 AM – 11:30 AM

Speaker: Michael Harpster, Director - Propulsion Systems Research Lab, General Motors Company

Short Biography: Mike Harpster is the Director of Propulsion Systems Research Lab, GM Global Research and Development. Mike is responsible for leading all research and development globally for conventional and electrified propulsion systems. Mike began his career with General Motors in 1994 as a project engineer with Advanced Engine Engineering in Pontiac, Michigan. He has a diverse background having worked in Advanced Engineering, Advanced Powertrain Vehicle Integration and Powertrain Product Planning. In August 2005, he became Engineering Group Manger, Hybrid Architecture where he was responsible for managing a global team developing next generation electrified propulsion systems and conducting system analysis. His team invented the Chevrolet Volt production drive unit, of which he is a co-inventor. He was appointed Assistant Chief Engineer for Electrification in October 2008, where he was responsible for leading a product engineering team in developing next generation hybrid and EREV systems. He studied Engineering Science and Mechanical Engineering at Penn State, receiving a B.Sc. in 1992 and a M.Sc. in 1994.

Tuesday, June 18, 2013 Keynote Presentations

Keynote Presentation 6: Mobile Metering – Basis of an Intelligent Charging Infrastructure at Significantly Reduced Cost

11:30 AM - 12:00 Noon

Speaker: Dr. Rupert Stuetzle, CTO, ubitricity, Germany

Short Biography: Rupert Stuetzle holds a diploma in Electrical Engineering and a doctorate in Software Engineering, both from Munich University of Technology. After five years in management consulting with McKinsey & Co. he joined Bosch in 2004. For four years, he managed engine ECU series development for the biggest customer. He then spent four years with the electromobility unit as VP for EV systems engineering and head of development for power electronics components. Rupert joined ubitricity, a Berlin-based start-up, as CTO in 2012.

18

Poster Session 2

Poster Session 2: Transportation, Standards, Infrastructure and Policies **Session Chairs:** Dr. Srdjan Lukic, North Carolina State University Dr. Baiming Shao, Technical Specialist - Mercedes Benz R&D Tuesday, June 18, 2013 12:00 PM - 2:00 PM Venue: Great Lakes Center (Exhibit Hall) Electric Motor Control for Hybrid Electric Vehicles based on Different Driving Cycles Yi Hou¹, Alexandre Ravey², David Bouquain², Fei Gao², Abdellatif Miraoui² and Weiguo Liu¹ ¹Northwestern Polytechnical University, China, ²Universite de technologie de Belfort-Montbeliard, France Modeling and Simulation of a Photovoltaic (PV) Based Inductive Power Transfer Electric Vehicle Public **Charging Station** Dimko Miskovski and Sheldon Williamson Concordia University, Canada PS-31 **Comparison Criteria for Hybrid/Electric Vehicles Traction System Architectures** Alexandre Battiston¹, Jean-Philippe Martin¹, El-Hadj Miliani², Babak Nahid-Mobarakeh¹, Serge Pierfederici¹ and Farid Meibody-Tabar¹ ¹Universite de Lorraine, France, ²IFP Energies Nouvelles, France PS-32 Dynamic Decoupling Control of a Centrifugal Compressor for Fuel Cell Systems for Transportation **Applications** Dongdong Zhao¹, Qing Zheng², Fei Gao¹, David Bouquain¹, Bo Li² and Abdellatif Miraoui¹ ¹University of Technology of Belfort-Montbeliard, France, ²Gannon University, USA Plug-in Hybrid Electric Vehicle Energy System Using Home-to-Vehicle and Vehicle-to-Home: PS-33 **Optimization of Power Converters Operations** Swathi Rao¹, Berthold Florence^{2,3}, Pandurangavittal Koppal¹, Blunier Benjamin², Bouquain David², Sheldon Williamson³ and Miraoui Abdellatif² ¹National Institute of Technology, India, ²University of Technology of Belfort-Montbeliard, France, ³Concordia University, Canada PS-34 Analysis of Electric Vehicle Impacts in New Mexico Urban Utility Distribution Infrastructure Brian Arellano¹, Santiag Sena², Shahin Abdollahy², Olga Lavrova², Sara Stratton¹, and Jon Hawkins¹ ¹Public Utility Service Company of New Mexico, USA, ² University of New Mexico, USA PS-35 Improving the Performance of an Active Power Filter as a Part of a Next Generation, Multifunctional, **High Power, Electrical Vehicle Charging Station** Yongbin Chu, Shuo Wang and Russell Crosier University of Texas at San Antonio, USA **PS-36 Development of a Predictive Model for Regenerative Braking System** Andrea Caratti, Gabriele Catacchio, Carlo Gambino and Narayan Kar University of Windsor, Canada **PS-37** Degraded Control Strategy Using State-of-Health in Fuel Cell Hybrid Electric Vehicle Sebastien Faivre, Alexandre Ravey, David Bouquain and Abdesslem Djerdir University of Technology of Belfort-Montbeliard, France PS-38 Electric Go-Kart with Battery-Ultracapacitor Hybrid Energy Storage System Wellington Avelino¹, Fellipe Garcia², Andre Ferreira³ and Jose Antenor Pomilio¹ ¹University of Campinas, Brazil, ²Ekion Electric Vehicles Technologies, Brazil, ³Federal University Juiz de For a, Brazil PS-39 Systematic Approach to the Modeling and Control of Hybrid Electric Vehicle Powertrains

Georgia Institute of Technology, USA

18

Poster Session 2

PS-40	Comprehensive Energy Loss Minimization Strategy for Parallel Plug-in Hybrid Electric Vehicles Changjian Hu, Yimin Gao and Alex Q. Huang North Carolina State University, USA
PS-41	Design Study of Parallel HEV Drive Train with Full Size Engine Lin Lai and Mehrdad Ehsani Texas A&M University, USA
PS-42	On Electrification of Mass Excavation Erik Uhlin and Joakim Unnebaeck Volvo Construction Equipment, Sweden
PS-43	Distance Estimation Algorithm for Plug-In Hybrid Electric Vehicle Control Strategy Alexandre Ravey ¹ , Rui Wang ¹ , Srdjan M. Lukic ² and Abdellatif Miraoui ¹ ¹ University of Technology of Belfort-Montbeliard, France, ² North Carolina State University, USA
PS-44	Electric Vehicle Supply Equipment: A Safety Device Kenneth Brown Leviton Manufacturing Co. Inc., USA
PS-45	Methodology for Efficiency and Performance Evaluation in Electrical Vehicles in Bogota DC Mateo Cortes Guzman, Jaime Ramirez Parra and Javier Rosero Garcia Universidad Nacional de Colombia, Colombia
PS-46	The Critical Role of Microgrids in Transition to a Smarter Grid: A Technical Review Adhithya Ravichandran, Pawel Malysz, Shahin Sirouspour and Ali Emadi McMaster University, Canada
PS-47	A Test Bed to Monitor Smart Grid Power Quality Nafia Al-Mutawaly ^{1,2} and Mehdi Alimardani ² ¹ Mohawk College, Canada, ² McMaster University, Canada
PS-48	Maximizing the Penetration of Plug-In Electric Vehicles in Distribution Network Junhui Zhao, Yang Wang, Caisheng Wang, Feng Lin and Le Yi Wang Wayne State University, USA
PS-49	The Impact of PHEV/EV Chargers on Residential Loads - A Case Study Laith Al-Musawi ¹ , Rocky Tran ¹ , Michael Dang ² and Nafia Al-Mutawaly ^{1,3} ¹ McMaster University, Canada, ² Hydro One Networks, Canada, ³ Mohawk College, Canada
PS-50	On-Road Charging of Electric Vehicles Pavol Bauer and Theodora-Elli Stamati Delft University of Technology, Netherlands
PS-51	The Impact of PHEV/EV Chargers on Residential Loads - A Case Study Laith Al-Musawi ¹ , Rocky Tran ¹ , Michael Dang ² and Nafia Al-Mutawaly ^{1,3} ¹ McMaster University, Canada, ² Hydro One Networks, Canada, ³ Mohawk College, Canada
PS-52	Comprehensive Modeling of Electric Vehicles to Analyze their Performance Based on Different Propulsion Profiles Saeedeh Hamidifar, Mahdi Mousavi and Narayan Kar University of Windsor, Canada
PS-53	Cadmium Telluride Solar Cell: From Device Modeling to Electric Vehicle Battery Management Khalid Nazmus Sakib, Kabir Zahangir and Sheldon Williamson Concordia University, Canada
PS-54	Reliability Evaluation for Traction Drive System of High-Speed Electrical Multiple Units Jianqiang Liu ¹ , Xiuguo Cui ¹ , Yong Jiang ² , and Mahesh Krishnamurthy ² ¹ Beijing Jiaotong University, China, ² Illinois Institute of Technology, USA

Technical Session 3: Transportation- I Session Chairs:

Shashi Velnati, Manager – Chrysler Group LLC Dr. Sanjaka Wirasingha, Chrysler Group LLC

> Tuesday, June 18, 2013 2:00 PM – 3:20 PM Venue: Regency J-K

S3-1 Assessments of Design, Packaging, and Operational Characteristics of Progressing EV, HEV, and PHEV Components

Tim Burress and Steven Campbell Oak Ridge National Laboratory, USA

S3-2 A Novel Fixed Displacement Electric Hydraulic Hybrid (EH2) Drivetrain for City Vehicles

Yingguang Sun¹, Jose Garcia² and Mahesh Krishnamurthy¹

Illinois Institute of Technology, USA, ²Purdue University, USA

S3-3 PEV Demand Flexibility and its Impact on the Electric Power System

Mahdi Kefayati and Ross Baldick University of Texas at Austin, USA

S3-4 An Average Modeling approach for Mobile Refrigeration Hybrid Power Systems with Improved Battery Simulation

Yue Cao and Philip Krein
University of Illinois at Urbana-Champaign, USA

Technical Session 4: Energy Storage- I Session Chairs:

Dr. Tae-Kyung Lee, Research and Advanced Engineering – Ford Motor Company
Dr. Adam Timmons, Technical Specialist – Chrysler Group LLC

Tuesday, June 18, 2013 2:00 PM – 3:20 PM Venue: Regency J-K

S4-1 Adaptive Online Battery Parameters/ SOC/ Capacity Co-estimation

Habiballah Rahimi-Eichi and Mo-Yuen Chow North Carolina State University, USA

S4-2 Sizing of ICE and Lithium-Ion Battery for Series Hybrid Vehicle over Life Cycle with Battery Aging

Daniela Chrenko, Zul Hilmi Che Daud, Zainab Asus, El-Hassane Aglzim, Luis Le Moyne, and Shiyu Gan *University of Bourgundy, France*

S4-3 Adaptive Temperature Monitoring for Battery Thermal Management

lenkaran Arasaratnam¹, Jimi Tjong², Ahmed Ryan¹ Mohammed El-Sayed¹, and Saeid Habibi¹
² McMaster University, Canada, ² University of Windsor, Canada

S4-4 Simulation of Internal Short Circuits on Lithium Ion Cells

Alvin Wu¹, Mahmood Tabaddor², Carl Wang² and Judith Jeevarajan³
¹UL LLC, USA, ²UL LLC, Taiwan, ³NASA Johnson Space Center, USA

University of Maryland at College Park, USA

Technical Session 5: Conductive and Inductive Charging Session Chairs:

Richard Scholer, Senior Technical Specialist – Chrysler Group LLC Deepak S. Gautam, Lead Power Electronics Engineer – Delta-Q Technologies

Tuesday, June 18, 2013 4:20 PM – 5:40 PM Venue: Regency G-H

S5-1 Oak Ridge National Laboratory Wireless Power Transfer Development for Sustainable Campus Initiative John Miller, Omer Onar, Steven Campbell, Chester Coomer, Cliff White and Larry Seiber Oak Ridge National Laboratory, USA S5-2 Design of a Zero-Voltage-Switching Large-Air-Gap Wireless Charger with Low Electrical Stress for Plug-In Hybrid Electric Vehicles Chen Duan, Chenguang Jiang, Allan Taylor and Kevin (Hua) Bai Kettering University, USA S5-3 Design Considerations for a Level-2 On-Board PEV Charger based on Interleaved Boost PFC and LLC Resonant Converters Haoyu Wang, Serkan Dusmez and Alireza Khaligh

S5-4 Genetic Algorithm Based Coil System Optimization for Wireless Power Charging of Electric Vehicles Puqi Ning, Omer Onar, and John Miller Oak Ridge National Laboratory, USA

Technical Session 6: Power Electronics- II Session Chairs:

Dr. Rashmi Prasad, Staff Research Engineer – General Motors R&D Center
Dr. Zhong Nie, Technical Specialist – Chrysler Group LLC

	Tuesday, June 18, 2013 4:20 PM - 5:40 PM Venue: Regency G-H
S6-1	Voltage Control of a Single Phase, Single-Stage, Isolated AC-DC Converter Nathan Weise and Nathan Reimensnyder University of Maine, USA
S6-2	Efficiency Comparison of SiC and Si-Based Bidirectional DC-DC Converter Di Han, Jukkrit Noppakunkajorn and Bulent Sarlioglu University of Wisconsin-Madison, USA
S6-3	A DSP-Based Zero Current and Discontinuous Conduction Mode Detection Method Colin Clark ¹ , Wilson Eberle ¹ and Fariborz Musavi ² ¹ University of British Columbia, Canada, ² Delta-Q Technologies Corp., Canada
S6-4	Energy Efficiency and Fault Tolerance Comparison of DC/DC Converter Topologies for Fuel Cell Electric Vehicles Damien Guilbert, Arnaud Gaillard, Abdoul N'Diaye and Abdesslem Djerdir University of Technology of Belfort-Montbeliard, France

Panel 7: Rare Earth Free Magnet Material

Tuesday, June 18, 2013 2:00 PM – 3:20 PM

Venue: Regency C-D



Panel Moderator: Hossein Dadkhah, Manager, Traction Motors, Chrysler Group LLC

Panelists:

Dr. Yucong Wang, Manager of Material Technology Group, GM

V. Anand Sankaran, Executive Technical Leader and Chief Engineer, Ford

John Hayden, Senior Manager, Automotive Systems, Toshiba International Corporation

Dr. Andy Judge, Engineering Manager, ASML

Dr. Keith Klontz, President and CEO, Advanced Motor Tech

Steve Constantinides, Director of Technology, Arnold Magnetic technologies

Dr. Ayman El-Refaie, GE Global Research

Panel Summary: Rare earth elements are used in an ever-growing variety of applications that are the key to our modern technology. Rare-earth magnets are typically two to three times stronger than ferrite or ceramic permanent magnets. In electric motors, the use of rare-earth magnets enables greater performance to be obtained from a smaller, lighter motor. Efficiency and torque density of this type of motors are the highest. Clearly this has its attractions for electric vehicles, where a lighter, more efficient motor reduces the amount of stored energy that has to be transported in the form of petrol, hydrogen or batteries. For industrial applications, the benefits of rare-earth magnets typically relate to the higher performance available from a motor of the same size, or lighter motors for equipment that is in motion.

Rare earth elements are essential for a wide variety of defense technologies that are critical to national security. Global demand for rare earth materials is projected to grow, fueled in part by continued development and deployment of emerging energy technologies, and as a result, a global shortage of rare earths is anticipated in the near future. Although the United States has 13 percent of the world's reserves, nearly all rare earth materials used in the country are imported from China. In contrast, China has only 36 percent of the world's rare earth reserves, yet accounts for more than 97 percent of global rare earth production. Furthermore, China has been reducing its export quotas in order to satisfy growing domestic demand, and is placing further emphasis on strengthening its vertically integrated supply chain in the rare earth industry by focusing on downstream rare earth products. Manufacturers of motors and products that incorporate motors, as well as government agencies, have started to take the view that this situation is unsustainable and that alternative technologies need to be developed. This panel is aimed at discussing some of these issues and the compromises made in incorporating rare earth free magnet materials.

Panel 8: On-board Chargers for PHEV/EV Application

Tuesday, June 18, 2013

2:00 PM - 3:20 PM

Venue: Regency E-F

Panel Moderator: Dr. Fariborz Musavi

Delta-Q Technologies Corp.

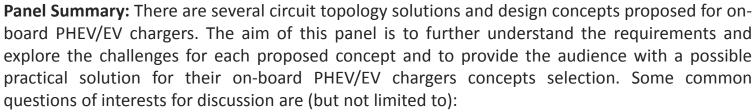
Panelists:

Dr. Wilson Eberle, University of British Columbia

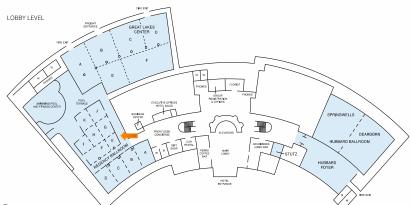
Dr. Lateef A. Kajouke, Engineering Specialist, General Motors

Dr. Gui-Jia Su, Oak Ridge National Laboratory

Deepak S. Gautam, Delta-Q Technologies Corp.



- Single-stage vs. Two-stage topology.
- Isolated vs. Non- Isolated topology.
- On-board charging vs. off-board charging.
- Power level: 3.3kW vs. 6.6kW, and the implications on package size, volume, and cost.
- Efficiency.
- Requirement of an auxiliary LV 12V output.
- Cooling system (liquid or air): Is it possible to be flexible?
- Mechanical packaging challenges.
- Common dimension and interface panel.
- Regulatory requirements.
- Challenges in component cost, and final finished product cost.
- Devices, Si devices vs. wide band-gap devices.
- DC link capacitors Film capacitor vs. AL Electrolytic capacitor.
- Warranty issues. How many years?
- AEC-Q100 and Q101 qualification.
- Manufacturing related challenges.



Panel 9: The Evolution of Heavy Duty Vehicle and Automotive Integrated Electronics Systems

Tuesday, June 18, 2013

4:20 PM – 5:40 PM Venue: *Regency C-D*

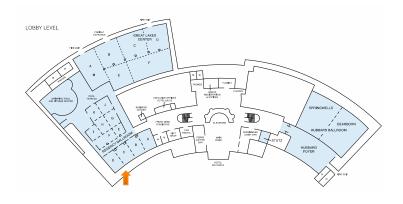
Panel Moderator: Mark Zachos, President of DG Technologies

Panelists:

Mr. Danial Bartz, US Army TARDEC Abel Carbonell, IDIADA Group Dr. Massimo Osella, General Motors Dr. Jeremy Daily, University of Tulsa Truck OEM or DOT representative (invited)

Panel Summary: This panel will focus on evolution of integrated electronics systems for heavy-duty vehicles and contrast them with automotive passenger vehicle advanced electronics. The panel discussion topics include:

- The evolution of heavy duty hybrid vehicle and automotive integrated electronics systems.
- Intelligent vehicle safety systems and advanced driver assistance systems.
- Electronic control systems and industry regulations.
- Standards for diagnostics and communications.
- Electronic controls and system design, development and testing.
- Autonomous and semi-autonomous vehicle electronic control systems.



Panel 10: Aerospace Applications – More Electric Aircraft

Tuesday, June 18, 2013 4:20 PM – 5:40 PM

Venue: Regency E-F

Panel Moderator: Dr. Bulent Sarlioglu, Assistant Professor and Associate Director of WEMPEC, University of Wisconsin–Madison

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Panelists:

Dr. Hassan Kojori, Honeywell Brian Dyra, Woodward Inc. Dr. Hao Huang, GE Aviation

Dr. Bulent Sarlioglu, University of Wisconsin-Madison

Panel Summary: We are witnessing a new beginning for the electrification of commercial aircraft. This electrification of aircraft is also called "More Electric Aircraft." Recent commercial airplanes that went into the revenue flights are no longer using the constant frequency electrical bus in their electric power system. Rather, the electrical bus frequency proportionally changes as a function of engine speed. This change requires use of power electronic circuitries to convert variable frequency AC power to various AC and DC power types that are needed in the aircraft for different type of loads. Similarly, there is a trend to eliminate the pneumatic and hydraulic systems with electrically driven systems to achieve better reliability and cost advantages. This opens the door for more power conversion equipment using electrical power. Due to all these changes, aerospace is looking at achieving low-weight, low-volume, more-efficient, highly reliable power conversion systems and components. To achieve power quality, normal and transient performances are also very important design considerations that require an in-depth understanding of technologies used. This panel will present the panelists' view of the More Electric Aircraft from the perspective of the generation, distribution, and utilization of electrical power. The panel will draw attendees from aerospace OEMs, suppliers (Tier 1 and Tier 2), and researchers from the field. Participants from EV/HV OEMs and suppliers will benefit from this panel by assessing the similarities and differences between aerospace and automotive industries.

Panel 11: IEVC Forum: Innovating The Transportation Landscape Via Advanced Vehicle-To-Infrastructure Connectivity

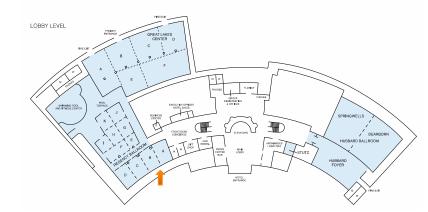
Tuesday, June 18, 2013 4:20 PM – 5:40 PM

Venue: Regency A-B

Panel Moderator: Joachim Taiber, CU-ICAR

Panelists:

Dale Hill, Founder of Proterra Michael O'Halloran of CH2MHill Marsden Burger, Principal Cabinentaxi LLC John Bobbitt, CEO Exponent Design Works



Panel Summary: This forum will provide multiple perspectives on how electrified vehicles interact with power and communication infrastructure. The first presentation will demonstrate how an electrical bus can be charged rapidly via a conductive technology. Although this technology is proprietary, the panel will discuss how conductive and wireless charging method for electrical buses can be standardized. Another aspect the panel will refer to is the need to ensure continued funding into the aging US road infrastructure by other means that the gasoline tax. The State of Oregon developed a mileage-based road usage fee model and we will learn in the second presentation how it works by connecting the vehicle with data centers and what it means for owners of electrified vehicles. Personal rapid transit systems have been so far a niche solution in the transportation segment but with the mass-deployment of vehicle electrification and autonomous driving systems they might experience a revival. We will learn in presentation more how PRT systems work and how they interact with power and communication infrastructure. Last but not least the development of the connected vehicle is leading to a growing segment of applications the driver of a vehicle can choose from to support the vehicle operation. The mobile phone acts as a bridge between the vehicle and the communication infrastructure of telecommunication service providers. An example of such an "app" is explained in the final panel presentation.

Tutorial 2: Model Based System Engineering (MBSE): The Rise of the Machines?

Wednesday, June 19, 2013 8:30 AM – 12:00 Noon

Venue: Rolls Royce



Speakers: Aymeric Rousseau and Larry Michaels, Argonne National Laboratory

Tutorial Description: Building hardware is expensive. Traditional design paradigms in the automotive industry often delay control system design until late in the process — in some cases requiring several costly hardware iterations. To reduce costs and improve time to market, it is imperative that greater emphasis be placed on modeling and simulation. Model Based System Engineering (MBSE) approach is meant to increase productivity by maximizing compatibility between systems (via reuse of standardized models), simplifying the process of design (via models of recurring design patterns in the application domain), and promoting communication between individuals and teams working on the system (via a standardization of the terminology and the best practices used in the application domain). The discussion will focus on how Autonomie can be used to support MBSE and some of the remaining challenges. Autonomie is a Plug-and-Play Powertrain and Vehicle Model Architecture and Development Environment to support the rapid evaluation of new powertrain/propulsion technologies for improving fuel economy through virtual design and analysis in a math-based simulation environment. Autonomie is an open architecture to support the rapid integration and analysis of powertrain/propulsion systems and technologies for rapid technology sorting and evaluation of fuel economy improvement under dynamic/transient testing conditions.

Speakers Short Biographies: Aymeric Rousseau is the Manager of the Systems Modeling and Control Group at Argonne National Laboratory. After working for PSA Peugeot Citroen for several years in the Hybrid Electric Vehicle research department, he joined Argonne National Laboratory in 1999 where he is now responsible for the development of Autonomie. Autonomie has been developed in collaboration with General Motors to accelerate the development and introduction of advanced technologies through a Plug & Play architecture.

Larry Michaels is a Principal Vehicle Systems Engineer at Argonne National Laboratory, working on the development and application of Autonomie. Prior to joining Argonne, he was a Technical Fellow in GM Powertrain Engineering, responsible for the institutionalization of modeling and simulation in the Powertrain Control System development process. He also spent five years at The MathWorks, Inc. as Manager of Applications Engineering, and previously had been a Senior Member of the Technical Staff at the Princeton University Plasma Physics Laboratory analyzing and modeling the power supply equipment for experimental fusion reactors.

Panel 12: Role of Entrepreneurship in Transportation Electrification

Wednesday, June 19, 2013

8:30 AM - 9:50 AM

Venue: Desoto A

Panel Moderator: Kevin Taylor, IEEE SE Michigan Section

Panelists:

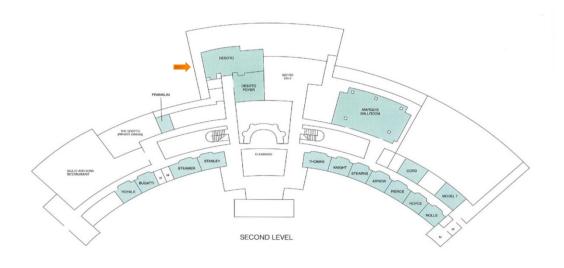
Mark Zachos, President of DG Technologies Lee Stogner, IEEE-USA

Dr. Ali Emadi, Canada Excellence Research Chair in Hybrid Powertrain and Director of MacAUTO, McMaster University

Jill Sorensen, BEVI

Mark Zhu, DTE Energy Ventures, Inc.

Panel Summary: This Entrepreneurship panel will address business development issues and resources for start-up companies focused on emerging technologies in the transportation and energy sectors. Panelists representing the entrepreneur, resources to support entrepreneurs and investors in transportation and energy start-ups will share their perspectives on driving innovation management and commercialization success. In addition, the panel will explore the role of entrepreneurship in advancing this transition both through entrepreneurship and intrepreneurship. Furthermore, the panel will focus on the importance of advancing innovation in the dynamic field of transportation electrification, and the opportunities possible from a range of perspectives.



Panel 13: Energy Storage Systems for Hybrid and Electric Vehicles

Wednesday, June 19, 2013 10:40 PM – 12:00 PM

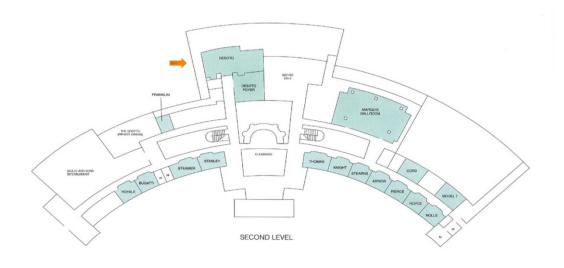
Venue: Desoto A

Panel Moderator: Dr. Dennis Arthur Corrigan, Wayne State University

Panelists:

J.T. Guerin, Engineering Specialist, General Motors
Alvaro Masias, Research Engineer, Ford Motor Company
Dr. Adam Timmons, Technical Specialist, Chrysler LLC
Martin Klein, Engineering Director, LG Chem Power
Carlton Brown, Director of Engineering, Robert Bosch Battery Systems LLC

Panel Summary: This panel will provide a perspective on the status of energy storage systems for hybrid and electric vehicles. What are the key issues today? What battery technologies will predominate going forward? Will lithium-ion batteries dominate HEV applications, or will there be continued opportunities for nickel-metal hydride batteries? What fundamental battery and systems improvements will be needed for widespread introduction of power-assist hybrid vehicles? What are the opportunities for advanced lead-acid batteries and supercapacitors for stop-start micro hybrids? What are the opportunities and technical barriers for high-energy lithium-air and lithium-sulfur batteries for battery electric vehicles? What is the capability of the US R&D community and battery industry to provide technology and products needed for widespread commercialization of electric drive vehicles?



Panel 14: Transportation Electrification Standards Roundtable

Wednesday, June 19, 2013

10:40 PM - 12:00 PM

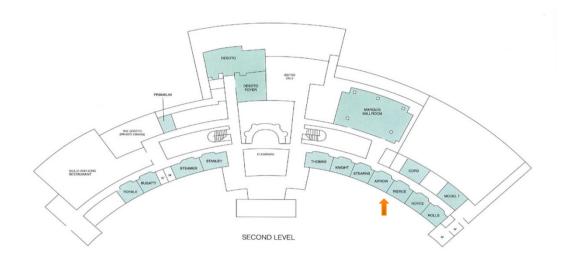
Venue: Pierce Arrow

Panel Moderator: Paul Bishop, P.E. President & Chief Engineer, The Bishop Group

Panelists:

Lee Stogner, IEEE-USA
Theodore Bohn, Argonne National Laboratory
Richard Scholer, Chrysler LLC
Paul Bishop, P.E. President & Chief Engineer, The Bishop Group

Panel Summary: Electrification as used here addresses the transfer and use of electric power in lieu of mechanical, hydraulic, pneumatic, internal combustion or other means. Electrification is surging in all areas of society. The impact of electrification on society will be at least as great as the personal computer. Most "civilians" will not directly see the applications but instead will benefit greatly in numerous untold ways. Our discussion will focus on transportation especially automotive vehicles. Transfer and use of electrical power and energy in transportation is burgeoning. As the advantages become recognized, the result is an ever-growing list of transportation applications. Operating in a global environment drives standardization on a global scale. This panel will use a roundtable format in an attempt to address standardization issues as viewed from different perspectives. Included will be representatives from industry and standards development organizations. The roundtable format is intended to provoke active participation and discussion among panel members and the audience.



Technical Session 7: Motor Drives Session Chairs:

Dr. Bin Wu, Manager - Mercedes Benz R&D Dr. Young-Joo Lee, Technical Specialist - Chrysler Group LLC

> Wednesday, June 19, 2013 8:30 AM - 10:10 AM

	Venue: Stearns Knight		
S7-1	Model Reference Adaptive System-Based Speed Estimators for Sensorless Control of Interior Permanent Magnet Synchronous Machines Yue Zhao ¹ , Wei Qiao ¹ and Long Wu ² ¹ University of Nebraska-Lincoln, USA, ² John Deere Electronic Solutions, USA		
S7-2	Loss Modeling and Comparison of VSI and RB-IGBT based CSI in Traction Drive Applications Gui-Jia Su and Puqi Ning Oak Ridge National Laboratory, USA		
S7-3	Electric Motor Control for Hybrid Electric Vehicles based on Different Driving Cycles Yi Hou ¹ , Alexandre Ravey ² , David Bouquain ² , Fei Gao ² , Abdellatif Miraoui ² and Weiguo Liu ¹ **Northwestern Polytechnical University, China, **University of Technology of Belfort-Montbeliard, France**		
S7-4	Hybrid Model-Based/Data-Based Inter-Turn Fault Detection Methods for PM Drives with Manufacturing Faults Nicolas Leboeuf ¹ , Thierry Boileau ¹ , Babak Nahid-Mobarakeh ¹ , Noureddine Takorabet ¹ , Farid Meibody-Tabar ¹ and Guy Clerc ² ¹ University of Lorraine, France, ² Lyon 1 University, France		
S7-5	A Novel Design of Electric Tire Concept Incorporating Permanent Magnet Linear Generators Arrangement Anas Labak, Gholam-Abbas Nazri and Narayan Kar University of Windsor, Canada		

Technical Session 8: Energy Storage-II

Session Chairs:

Anand Sankaran, Executive Technical Leader & Chief Engineer – Ford Motor Company Dr. Hong H. Yang, Manager - Chrysler Group LLC

> Wednesday, June 19, 2013 8:30 AM - 10:10 AM

	Venue: Pierce Arrow
S8-1	Enhanced Battery/Ultracapacitor Hybrid Energy Storage System and Split Powertrain for Next Generation Performance Vehicles Steven Rogers ¹ , Andrew Saul ¹ , Serkan Dusmez ² and Alireza Khaligh ² ¹ Genovation Cars Inc., USA, ² University of Maryland at College Park, USA
S8-2	High Temperature - High Energy Density Polymer-Coated Glass Capacitors Mohan Prasad Manoharan ¹ , Michael Lanagan ¹ , Shihai Zhang ² , Douglas Kushner ² , Chen Zou ² and Takashi Murata ³ ¹ Pennsylvania State University, USA, ² Strategic Polymer Sciences, USA, ³ Nippon Electric Glass, Japan
S8-3	Optimal Sizing of the Energy Storage System (ESS) in a Battery-Electric Vehicle Amir Ostadi ¹ , Mehrdad Kazerani ¹ and and Shih-Ken Chen ² ¹ University of Waterloo, Canada, ² General Motors, USA
S8-4	Characterization of a Commercial Automotive Lithium Ion Battery using Kalman Filter Moemen Daboussy, Daniela Chrenko, El-Hassane Aglzim, Zul Hilmi Che Daud and Luis Le Moyne University of Burgundy, France
S8-5	Online State of Charge and Electrical Impedance Estimation for Multicell Lithium-Ion Batteries

Taesic Kim, Wei Qiao and Liyan Qu University of Nebraska-Lincoln, USA

	Technical Session 9: Transportation- II Session Chairs: Michael Runyon, Manager – Chrysler Group LLC Sheldon Williamson – Concordia University		
	Wednesday, June 19, 2013 10:40 AM — 12:00 PM Venue: Stearns Knight		
S9-1	Component Improvements in the Electrification of Passenger Vehicles Drivetrains Thomas Devloo, Niels Leemput, Juan Van Roy, Frederik Geth, and Johan Driesen University of Leuven (KU Leuven), Belgium		
S9-2	A New Parallel-Series Configuration for Hybridization of a Line-Haul Truck Fereydoon Diba and Ebrahim Esmailzadeh University of Ontario Institute of Technology, Canada		
S9-3	Frequency Demodulation-Aided Condition Monitoring for Drivetrain Gearboxes Dingguo Lu and Wei Qiao University of Nebraska-Lincoln, USA		
S9-4	Plug-In Vehicle to Home (V2H) Duration and Power Output Capability David Tuttle, Robert Fares, Michael Webber and Ross Baldick University of Texas at Austin, USA		

ITEC Steering Committee

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Peter Steimer, ABB Switzerland Ltd.

Call For Papers

IEEE Journal of Emerging and Selected Topics in Power Electronics Special Issue on Transportation Electrification, 2014

This Special Issue is focused on components, sub-systems, systems, and grid interface technologies related to power and energy conversion for all types of electrified vehicles including electric vehicles, hybrid electric vehicles, and plug-in hybrid electric vehicles as well as heavy-duty, rail, and off-road vehicles and airplanes and ships. Prospective authors are invited to submit original contributions or survey papers for review for publication in this Special Issue. Enhanced papers accepted for presentations at ITEC, APEC, and ECCE are welcome. Topics of interest include (but are not limited to):

- Hybrid electric vehicles (HEVs) and plug-in hybrid electric vehicles (PHEVs)
- Electric vehicles (EVs) and range-extended EVs
- Hybrid and electric powertrains and powertrain components
- Vehicular power electronics and motor drives
- Electric machines and actuators in vehicles and transportation systems
- Propulsion systems and Electronic control units
- On-board and off-board chargers, fast chargers, opportunity chargers, and Inductive charging
- Vehicle-to-grid (V2G) interface and grid interface technologies
- Energy storage systems; battery management systems
- · Electrification of heavy-duty and off-road vehicles
- Electrification of trains and rail vehicles
- Applications of fuel cells in transportation
- Electrical systems and components for sea, undersea, air, and space vehicles
- Environmental impacts and source-to-wheel analysis

All manuscripts must be submitted through Manuscript Central at http://mc.manuscriptcentral.com/jestpe-ieee.

Submissions must be clearly marked "Special Issue on Transportation Electrification, 2014" on the cover page. When uploading your paper, please also select the "Special Issue on Transportation Electrification, 2014."

Guest Editor-in-Chief: Ali Emadi, McMaster University, Canada (emadi@mcmaster.ca)

Proposed Timeline:

April 15, 2013 – Call for Papers to IEEE JESTPE Editorial Office

October 1, 2013 – Manuscripts Submission Deadline
March 1, 2014 – Final Acceptance Notification

May 1, 2014 — Manuscripts Forwarded to IEEE for Publication

June 1, 2014 – Special Issue Appears in IEEE JESTPE

2014 ITEC: Call for Papers



June 15-18, 2014
Dearborn, Michigan, USA
http://itec-conf.com/

Paper and presentation proposals are being invited in the following or related technical track topic areas:

Power Electronics and Electric Motor Drives

Electric Machines and Actuators

Battery and Battery Management

Electric, Hybrid Electric, and Plug-in Hybrid Electric Vehicle System Architectures

Smart Grid, Electrical Infrastructure, and V2G

Electrification of Heavy-Duty and Off-Road Vehicles

Fuel Cells and Applications in Transportation

Electrical Systems and Components for Sea, Undersea, Air, and Space Vehicles

Modeling, Simulation, and Control

Standards, Policies, and Regulations for Transportation Electrification

Paper Submission Guidelines

Prospective authors are invited to submit their paper proposals through the conference webpage (http://itec-conf.com/). Each paper proposal must include:

Technical track name, paper title, name(s) of author(s), affiliation(s), mailing address(es), and e-mail address(es). If there are multiple authors, please identify the corresponding author.

An abstract of maximum 100 words and a digest of maximum 5 pages (single-column, double spaced, including figures and tables).

Special Presentation (SP) only Sessions

Authors who would like to present their work, but do not wish to contribute a full paper can submit a 1-page digest for "Special Presentation (SP) only Sessions." A regular paper is not needed. If accepted, speakers could make a presentation at the conference. Such presentations and 1-page digests will not be published in IEEE Xplore.

2014 ITEC: Call for Papers



June 15-18, 2014
Dearborn, Michigan, USA
http://itec-conf.com/

Key Dates

Deadline for submission of paper proposals (abstracts/digests): November 15, 2013

Author's notification of acceptance: February 7, 2014

Deadline for submission of final camera-ready manuscripts:

April 4, 2014

Deadline for early registration: April 4, 2014

Exhibition

The conference will feature an industry exhibition focused on electrified vehicles and components, subsystems, and systems for all types of electrified vehicles and transportation systems (land, air, space, and sea). Exhibitor package includes:

Two complimentary registrations with every 10'x10' booth space purchased Presentation time in the exhibit hall Exhibitor literature will be included in conference materials

Unit Cost (10'x10' Booth Space) Corporation: \$2,500.00

Non-Profits, Small Businesses/Start-Ups/Universities: \$1,500.00

Exhibitor Registration

Register online at http://itec-conf.com/exhibition/

General Chair: Mahesh Krishnamurthy, Illinois Institute of Technology

General Co-Chair: Silva Hiti, General Motors

Program Chair: Anand Sathyan, Chrysler Group LLC

Conference Venue and Contacts

Conference Site and Hotel Reservation

Adoba Hotel Dearborn/Detroit (Former Hyatt Regency) 600 Town Center Drive Dearborn, Michigan 48126, USA Tel: +1-313-593-1234

URL: http://dearborn.hyatt.com



Hotel Reservation

A dedicated booking website has been created for ITEC'13 so ITEC attendees will be able to make, modify and cancel their hotel reservations online, as well as take advantage of any room upgrades, amenities or other services offered by the hotel:

http://www.adobadearborn.com/



ITEC's negotiated Group Rate is: Single/Double - \$135.00

This Group Rate is exclusive of applicable sales/room taxes. In order to take advantage of the above negotiated Group Rate, the reservation cut-off date is Saturday, May 25, 2013 at 8:00 PM (U.S. Eastern) time, on a first come, first served basis.

Conference General Chair

Professor Alireza Khaligh Electrical and Computer Engineering Department Institute for Systems Research University of Maryland College Park, MD 20742, USA

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Website: itec-conf.com

