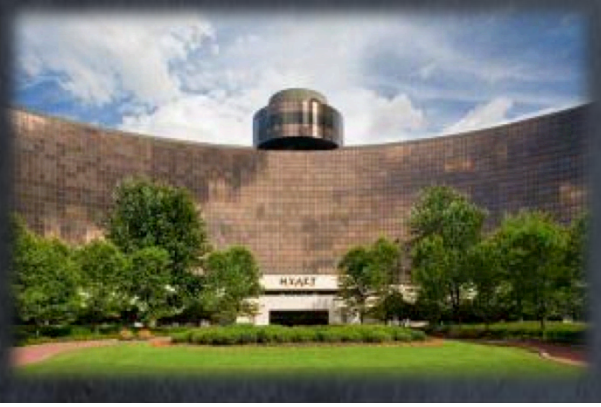
ITEC is aimed at helping the industry transition from conventional vehicles to advanced electrified vehicles.

Final Program

2015 IEEE Transportation Electrification Conference and Expo (ITEC'15)

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



June 14-17, 2015

Adoba Hotel Dearborn/Detroit

Dearborn, Michigan, USA

ITEC2015

ITEC Sponsors: IEEE | pels IEEE POWER ELECTRONICS SOCIETY | 50 years IAS IEEE INDUSTRY APPLICATIONS SOCIETY | IEEE PES Power & Energy Society®

Welcome Message from General Chair

It gives me great pleasure to welcome you to the 2015 IEEE Transportation Electrification Conference and Expo (ITEC'15). 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 heavy-duty, rail, and off-road vehicles and airplanes and ships.

The ITEC'15 organizing committee has worked diligently to create an excellent technical conference for you. We would like to express our heartfelt gratitude for their dedication and countless hours of work. Thanks to 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 five short courses offered by internationally renowned 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.

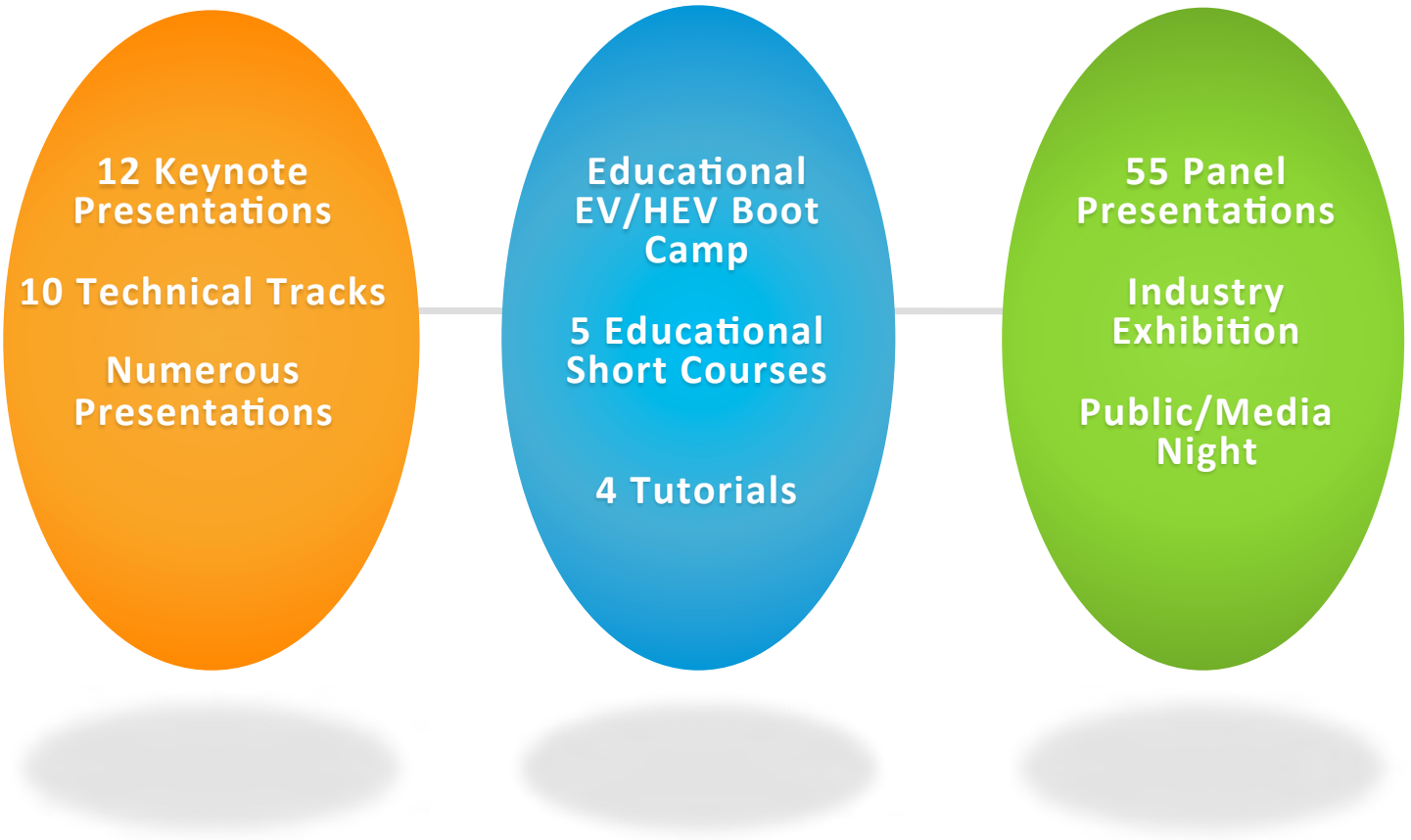
We would like to extend a warm welcome to this year's ITEC and look forward to meeting you over the four days of the conference. We hope that you have a memorable experience. If you are not already a part of the broader organizing community of ITEC and would like to be directly involved with the conference, 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,

Anand Sathyan
General Chair, ITEC'15

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…

KEYNOTE PRESENTATIONS

IT'S ABOUT THE KNOWLEDGE SHARED...

Anand Sankaran
Chief Engineer & Executive Technical Leader
FORD MOTOR CO.

Denise Gray
Vice President, Powertrain Electrification
AVL

Bruno Lequesne
President
E-Motors Consulting LLC

Tomy Sebastian
Director of Motor Drive Systems
Halla Mechatronics

Giorgio Rizzoni
Ford Motor Company Chair in Electromechanical Systems
Ohio State University

Burak Ozpineci
Manager, Electric Drive Technologies
Oak Ridge National Lab.

Kamiar Karimi
Senior Technical Fellow
Boeing

Bulent Sarlioglu
Professor and Associate Director
WEMPEC

Saeid Habibi
Director of the Centre for Mechatronics and Hybrid Technologies
McMaster University

Philip Krein
Professor and Director of the Grainger Center for Electric Machinery and Electromechanics
University of Illinois

Volker Pickert
Head of the Electrical Power Research Group
Newcastle University

Prabhakar Patil
CEO
LG Chem Power

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 15, 2015) and Tuesday (June 16, 2015).

At each panel, the panel moderator/organizer and panelists will each give a short 5-10 minute presentation/ speech and then open the floor to the audience for an open panel discussion and Q&A.

Panel 1
Global Collaboration and Role of OEM and Suppliers in Making of Successful Electric Vehicles

Panel 2
Connected Electrified Vehicles and Cybersecurity

Panel 3
Functional Safety – Its Challenge and Implication with the Development of Electric Vehicles

Panel 4
Mild Hybrid – Developing Optimal Performance/Cost Ratio System Configurations and Standardize Technical Solutions for Mass Production

Panel 5
Battery Management Technology in Automotive Applications

Panel 6
Advancements in Energy Management and Controls for Electric Vehicles

Panel 7
Challenges and Advancements in the Development of Real-time Modeling and Simulation of HEV/PHEV/EV Components and Systems

Panel 8
Market Penetration of EV, HEV, PHEV and their Batteries

Panel 9
Semiconductor Technology Development for Transportation Electrification

Panel 10
Application for Secondary Use of Automotive Batteries

Panel 11
Charging Technology, Logistics, and Infrastructure

Educational EV/HEV Boot Camp

Short Course 1
Principles of Hybrid Vehicle Powertrain and its Diagnostics

Short Course 2
Battery Technologies for Automotive Applications

Short Course 3
Fuel Cell Technology for Transportation Applications

Short Course 4
Moving on from Silicon – an Introduction to GaN in Transportation Applications

Short Course 5
An Analysis of Pack Short Circuits as a Cause of xEV Battery Fires

Tutorial 1
48V Electrification Systems: An overview of Belt Assisted Starter Systems

Tutorial 2
Regulatory Overview, Testing and Certification of Electrified Vehicles for Emissions and Fuel Economy

Tutorial 3
Electric Motor and Transformer Noise Modeling

Tutorial 4
Evolution of Electric Motor Designs and Controls for GM's EV and HEV Applications

ITEC Steering Committee

ITEC'15 Organizing Committee

General Chair
Anand Sathyan, FCA US LLC

General Co-Chairs
Babak Nahid-Mobarakeh, University of Lorraine, France
Sanjaka G. Wirasingha, Valeo

Program Chair
Berker Bilgin, MacAUTO, McMaster University, Canada

Program Co-Chair
Xiaodong Shi, Mercedes-Benz R&D

Panels Chair
Omer C. Onar, Oak Ridge National Laboratory

Panels Co-Chairs
Fei Gao, University of Technology of Belfort-Montbeliard, France
Mohamad Berri, Ford Motor Co.

Short Courses/Tutorials Chair
Lucia Gauchia, Michigan Technical University

Exhibit Chair
Adam Cook, Okaya USA

Registration Chair
Teresa Janes, MacAUTO, McMaster University, Canada

Automotive Industry Liaison Chairs
Bin Wu, Mercedes-Benz R&D
Suresh Gopalakrishnan, General Motors
Michael Degner, Ford Motor Co.
Hong Yang, FCA US LLC
Konstantinos Laskaris, Tesla Motors
David Cottini, JMAG
Serdar Yonak, Ford Motor Company

Awards Chair
Alireza Khaligh, University of Maryland

Technical Chair for Electric Machines
Hossein Dadkhah, FCA US LLC

IEEE Southeastern Michigan Section Liaison Chair, Kevin Taylor

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
Travis Overdahl, 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 Chairs
Uday Deshpande, General Atomics

Battery Industry Liaison Chair
Said Al-Hallaj, All Cell Technologies

IAS Representatives
Tomy Sebastian, Halla Methatronics, President Elect, IEEE- IAS
Ayman El-Refaie, General Electric
Avoki Omekanda, General Motors
Mohammad Islam, Halla Mechatronics

PES Representatives
Abdel-Aty Edris, Quanta Technology

Technical Track Chairs and Co-Chairs

Track 1: Power Electronics and Electric Motor Drives
Chair: Baiming Shao, Mercedes-Benz R&D, USA
Co-Chair: Zhong Nie, Atieva, USA

Track 2: Electric Machines and Actuators
Chair: Xiaodong Shi, Mercedes-Benz R&D, USA
Co-Chair: Ganga Jayaraman, MPC Woodward, USA

Track 3: Battery and Battery Management
Chair: Lucia Gauchia, Michigan Tech University, USA
Co-Chair: Srdjan Lukic, North Carolina State University, USA

Track 4: Electric, Hybrid Electric, and Plug-in Hybrid Electric Vehicle System Architectures
Chair: Sheldon Williamson, University of Ontario Institute of Technology, Canada
Co-Chair: Berker Bilgin, McMaster University, Canada

Track 5: Smart Grid, Electrical Infrastructure, and V2G
Chair: Elias Ayana, Cummins Generation, USA
Co-Chair: Richard Scholer, FCA US LLC, USA

Track 6: Electrification of Heavy-Duty and Off-Road Vehicles
Chair: Jin Wang, Ohio State University, USA
Co-Chair: Qiuming Gong, Ford Motor Co., USA

Track 7: Fuel Cells and Applications in Transportation
Chair: Fei Gao, Université de Technologie de Belfort-Montbéliard (UTBM), France
Co-Chair: Omer C. Onar, Oak Ridge National Laboratory, USA

Track 8: Electrical Systems and Components for Sea, Undersea, Air, and Space Vehicles
Chair: Babak Nahid-Mobarakeh, University of Lorraine, France
Co-Chair: Alireza Safaee, Osram Sylvania, 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

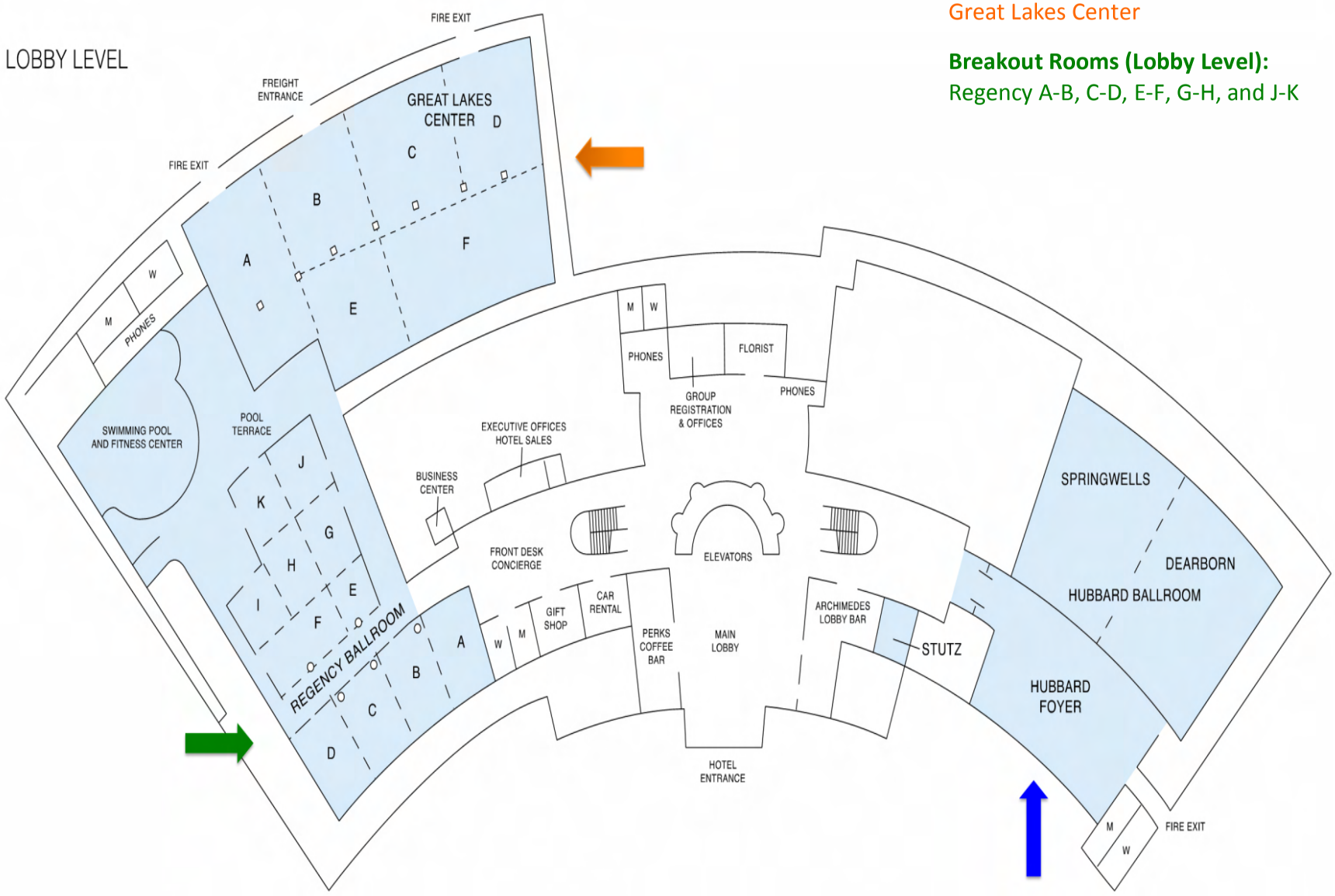
Track 10: Standards, Policies, and Regulations for Transportation Electrification
Chair: Sanjaka G. Wirasingha, Valeo, USA

Meeting Room Floor Plan

Plenary Sessions:
Springwells (Hubbard) Ballroom

Exhibit Hall:
Great Lakes Center

Breakout Rooms (Lobby Level):
Regency A-B, C-D, E-F, G-H, and J-K



Program-at-a-Glance

Program-at-a-Glance
2015 IEEE Transportation Electrification Conference and Expo (ITEC'15)
June 14-17, 2015

	7:30AM-8:30AM	8:30AM-10:10AM	10:10AM-10:30AM	10:30AM-12:00PM	12:00PM-2:00PM	2:00PM-3:20PM	3:20PM-4:20PM	4:20PM-5:40PM	5:40PM-7:30PM
Sunday June 14, 2015	Conference Registration Open	Educational EV/HEV Boot Camp	Coffee Break	Educational EV/HEV Boot Camp	Lunch (on own)	Educational EV/HEV Boot Camp	Coffee Break in Exhibit Hall	Educational EV/HEV Boot Camp	
Monday June 15, 2015		Plenary Session 1		Plenary Session 1	Poster Session 1 Exhibit Hall Buffet Lunch	Tutorial 1 Session 1 Panel 1 Panel 2 Panel 3		Tutorial 2 Session 2 Panel 4 Panel 5 Panel 6	Public/ Media Night in Exhibit Hall
Tuesday June 16, 2015		Plenary Session 2		Plenary Session 2	Poster Session 2 Exhibit Hall Buffet Lunch	Tutorial 3 Session 3 Panel 7 Panel 8		Tutorial 4 Session 4 Panel 9 Panel 10 Panel 11	Conference Social Event in Exhibit Hall
Wednesday June 17, 2015		Session 5 Session 6 Session 7 Session 8		Session 9 Session 10 Session 11 Session 12					

Exhibit Hall Open:
Monday, June 15th, 12:00 Noon – 7:30 PM
Tuesday, June 16th, 12:00 Noon – 7:30 PM

Sunday, June 14, 2015

Educational EV/HEV Boot Camp

Short Course 1: Principles of Hybrid Vehicle Powertrain and its Diagnostics

Sunday, June 14, 2015

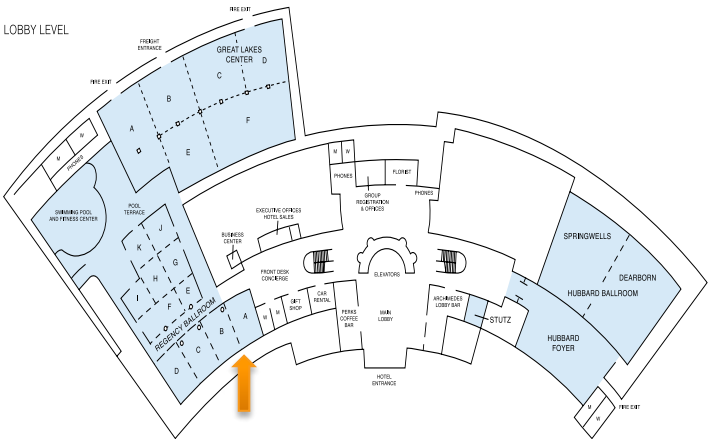
8:30 AM – 12:00 Noon

Venue: Regency A-B

Instructor: Jack Rosebro, Perfect Sky Inc.

Short Course Description: This short course will provide a top-down, generalist's view of hybrid, plug-in hybrid, and electric vehicle powertrains. We will discuss the theory, design, operation, function, and diagnosis of powertrain components, including battery packs, inverters, DC-DC converters, motor-generators, ancillary devices, and control systems, and will regard death component within the context of overall powertrain operation. Emerging subjects such as wireless charging, vehicle-to-grid, life after lithium-ion, silicon-carbide inverters, telematics, and haptics will be explored, as well.

Instructor's Short Biography: Jack Rosebro of Perfect Sky has taught on the subjects of hybrid, plug-in hybrid, and electric vehicle technology for more than a decade. His primary areas of research are onboard diagnostics and field diagnostics. In conjunction with SAE International, he presents online web seminars on hybrid and electric vehicle technology. Clients include most of the world's automotive manufacturers as well as many Tier 1 suppliers. He is based in California.

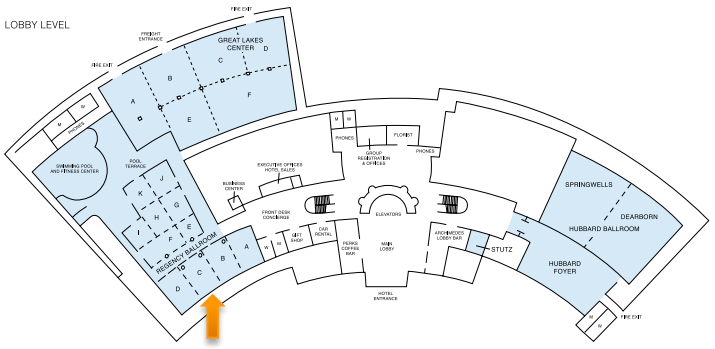


Sunday, June 14, 2015

Educational EV/HEV Boot Camp

Short Course 2: Introduction to Management and Control of Electric Vehicle Batteries

Sunday, June 14, 2015
8:30 AM – 12:00 PM
Venue: Regency C-D



Instructor: Dr. Ryan Ahmed, Technical Specialist, Fiat Chrysler Automobiles (FCA) – Canada

Short Course Description: This course covers the principals of Battery Management Systems (BMS) for monitoring, diagnosis, and control of batteries in Hybrid Electric Vehicles (HEVs) and Battery Electric Vehicles (BEVs). The course is targeted towards systems engineers, research scientists, and academics who want to gain a fundamental understanding of battery modeling, analysis, state-of-charge, and state-of-health estimation. Topics include introduction to battery systems, battery equivalent circuit-based modeling, battery electrochemical modeling, reduced-order modeling, cell balancing, thermal management, state-of-charge, and state-of-health estimation. Concepts such as parameters estimation, system identification, optimization, filtering, and control theory will be applied to battery systems. The techniques covered in this course are mostly related to Li-ion cells and packs as used in automotive applications. These can however also be applied to other battery chemistries.

Instructor's Short Biography: Ryan is currently a Scientific Research and Experimental Development Technical Specialist at the Automotive Research and Development Center (ARDC) – Fiat Chrysler Automobiles (FCA). Ryan holds a doctorate degree in Mechanical Engineering, with specialization in battery management systems and control from McMaster University. Ryan is also sessional instructor and adjunct professor at the Center for Mechatronics and Hybrid Technologies (CMHT) at McMaster University. Ryan received a Master's degree in Mechanical Engineering from McMaster, with focus on artificial intelligence and engine fault detection. Prior to joining Fiat Chrysler Automobiles, Ryan held different engineering positions in both industrial and academic settings. Most recently, he worked as a Research and Development Engineer at Ford Powertrain Engineering Research and Development Center (PERDC) on behalf of McMaster University.
Ryan has authored over 10 peer-reviewed journal and conference papers in the area of hybrid vehicles control, battery state-of-charge and state-of-health estimation, and battery monitoring and control. He has been an active speaker at several international conferences including the Advanced Automotive Battery Conference (AABC, Strasbourg, France, 2013), the Battery Safety Conference (San Diego, CA, USA, 2013), and the Battery Show (Novi, MI, USA, 2014). Ryan was the recipient of best paper award at the IEEE Transportation Electrification Conference and Expo (ITEC 2012) in Detroit, MI, USA. He is currently a Stanford Certified Project Manager (SCPM), certified Professional Engineer (P.Eng.) in Ontario and a member of the Green Auto Powertrain (GAPT) research team.

Sunday, June 14, 2015

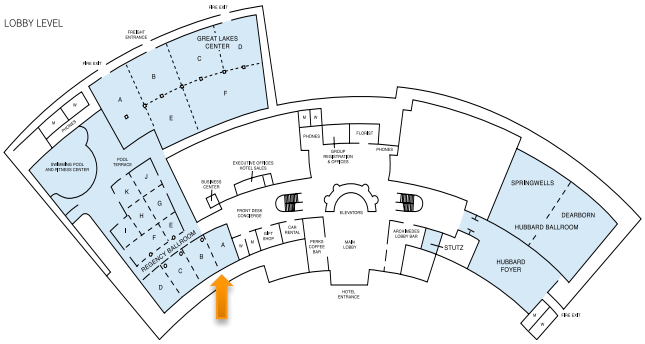
Educational EV/HEV Boot Camp

Short Course 3: Fuel Cell Technology for Transportation Applications

Sunday, June 14, 2015

2:00 PM – 5:30 PM

Venue: Regency A-B



Instructor: Dr. Fei Gao, Associate Professor, University of Technology of Belfort-Montbeliard (UTBM), France

Short Course Description: The fuel cell is a potential candidate for energy storage and conversion in our future energy mix. Indeed, a fuel cell is able to directly convert the chemical energy stored in fuel (e.g. hydrogen) into electricity, without undergoing different intermediary conversion steps. Among the different fuel cell types, the proton exchange membrane (PEM) fuel cell has shown great potential in automotive applications, due to its low operating temperature, solid-state electrolyte, and compactness. Many experts consider the PEM fuel cells to be one of the potential embarked energy candidates for terrestrial transportation. This course will mainly focus on the proton exchange membrane (PEM) fuel cell technology which has been used specially in transportation applications. The PEM fuel cell fundamentals, such as its physics, structure, power characteristics, efficiency, will be presented and discussed. The fuel cell system with its key ancillary components, such as air compressor, hydrogen tank, power converter, will also be introduced. Different powertrain configurations with fuel cells in automotive applications will be discussed and shown with real examples around the world. An emphasis on the fuel cell economic aspects and a short introduction to hydrogen economy will be given at last.

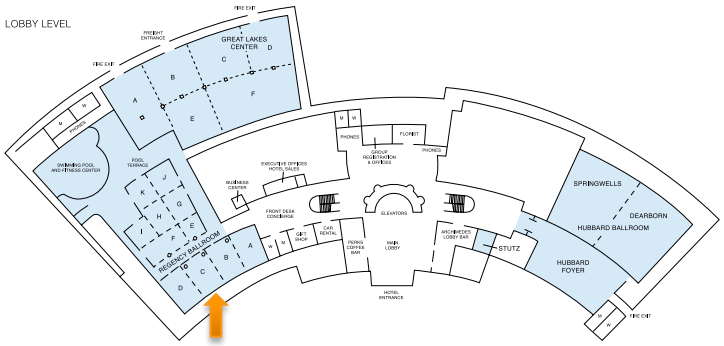
Instructor's Short Biography: Dr. Fei Gao is currently an associate professor at the energy department of the University of Technology of Belfort-Montbeliard (UTBM), Belfort, France. He received respectively from UTBM the Master's degree in electrical and control system engineering in 2007, and the PhD degree in renewable energy with distinguished youth doctor reward in 2010. His main research fields include fuel cells and their applications in transportation, multi-physical modeling and real time simulation systems. He is the head of the energy production division of department of Energy of UTBM, and the chair of fuel cell modeling axis of the Fuel Cell Research Federation (FR CNRS) in France. Since 2014, he is also appointed as adjunct lecture professor at School of Automation of the Northwestern Polytechnical University in China. He is an associate editor of IEEE Transactions on Industry Applications, IEEE Transactions on Transportation Electrification and editor of the IEEE Transportation Electrification Newsletter. He was elected in 2013 as Secretary (IEEE officer) of the Technical Committee on Automotive Technology (TCAT) of IEEE Industry Electronic Society (IES). He serves also as technical track chair and member of organizing committee in many IEEE international conferences (IECON, ITEC, APEC).

Sunday, June 14, 2015

Educational EV/HEV Boot Camp

Short Course 4: Moving on from Silicon – an Introduction to GaN in Transportation Applications

Sunday, June 14, 2015
2:00 PM – 5:30 PM
Venue: Regency C-D



Instructor: Julian Styles, Director of Sales and Marketing, GaN Systems

Short Course Description: This course will introduce gallium nitride power semiconductor technology, explain why it improves on currently-available technologies, and discuss a range of transportation applications. Areas covered will include: requirements for power electronics in hybrid and non-hybrid vehicles; comparison of semiconductor materials (and why the differences matter); basic principles of GaN transistor operation; roadmap for available GaN technology; methods for taking advantage of GaN in real circuits; survey of GaN applications; applications of GaN in vehicles, including electric propulsion, stop-start, EPAS, HVAC, audio, FCV, and hybrid architectures. Course content will focus on system-level issues, and will be suitable for engineers working on vehicle systems and electrical architecture as well as electronics designers.

Instructor's Short Biography: Julian Styles has a 25-year track record of working with innovative technologies in the USA, Europe and worldwide. As a technology consultant in Europe, he helped develop the technology behind digital cellphones, electric vehicle grid integration, and digital audio broadcast. In the 1990s he helped lead the team that developed the first practical on-board fast-charger for electric vehicles, and pioneered control systems for managing grid stability using electric vehicle chargers. He established and led the automotive multimedia team at Pi Group in the UK, a leader in the integration of personal digital devices, heads-up displays, MP3s and proximity sensing into vehicle interiors. Since moving to the USA in 2007, he helped spearhead the use of rapid development tools in areas such as advanced emissions control and active suspension. He joined GaN Systems in 2012, where he is responsible for introducing the company's advanced gallium nitride power semiconductors to the US market. Julian is a graduate of the University of Cambridge and Ashridge Business School.

Sunday, June 14, 2015

Educational EV/HEV Boot Camp

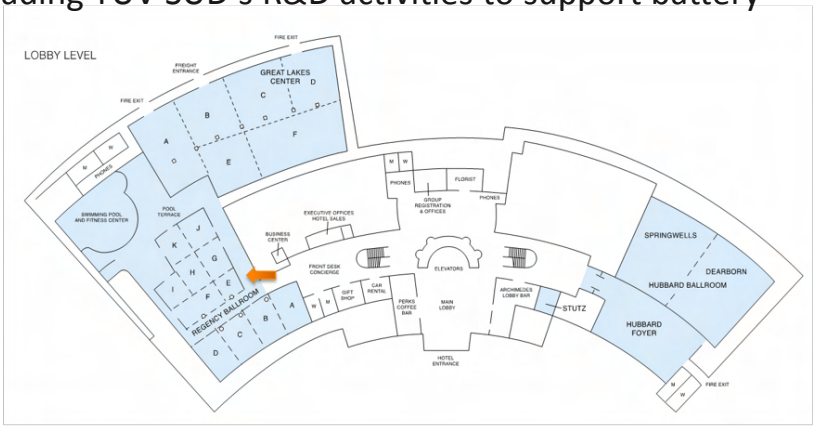
Short Course 5: An Analysis of Pack Short Circuits as a Cause of xEV Battery Fires

Sunday, June 14, 2015
2:00 PM – 5:30 PM
Venue: Regency E-F

Instructor: Erik J. Spek, TUV SUD, Canada

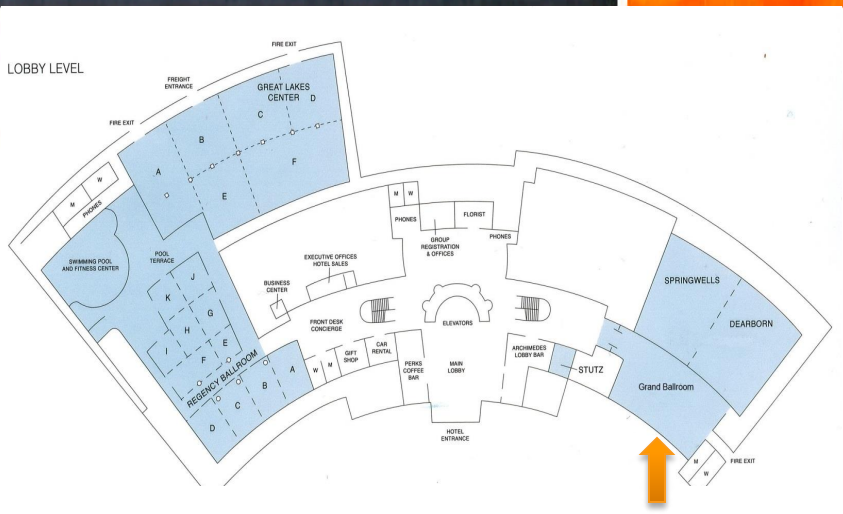
Short Course Description: TUV SUD undertook a series of tests in 2014 to conduct battery abuse at both the pack and vehicle level. Of 19 packs and xEVs tested, 7 resulted in fire. The tests conducted were complete vehicle seawater immersion, internally provoked fire propagation in xEVs and external pack fire. The course will examine the results of these events and relate them to pack short circuits as a cause of pack fires and consequently xEV vehicle fires. It will also look at proposed work to verify the limits of short circuits in causing EUCAR Hazard Severity Level 7 (explosion) events in xEVs.

Instructor's Short Biography: Erik J. Speck is Chief Engineer for TÜV SÜD Canada with technical responsibility for battery verification services in North America. He received degrees in mechanical engineering from the University of Waterloo, Canada. Industrial Experience includes TÜV SÜD Canada, Managing Director at Aloxsys Inc., Chief Engineer at Magna International, Manager of Engineering and Operations at ABB Advanced Battery Systems and Director of Engineering at Powerplex Technologies Inc. He was a member of the ABB sodium sulfur battery team that provided 38 kWh battery packs for the Ford Ecostar program. Mr. Spek is a Professional Engineer in Ontario, Canada, a member of SAE since 1980 and a Certified Manufacturing Engineer in the Society of Manufacturing Engineers. He has authored and co-authored papers on sodium sulfur battery development and Lithium Ion battery testing and has written articles on battery technologies for Batteries International, Charged and Penton Media. He is an SAE seminar leader on battery technology and safe handling of high voltage batteries and has delivered seminars to the energy storage industry, academia, government and other institutions. He has contributed to conferences on battery product standardization and presented at conferences including AABC (Advanced Automotive Batteries Conference), The Novi Battery Show, SAE New Energy Vehicles Conference, Battery Safety Conference and IEEE PSES. He is leading TUV SUD's R&D activities to support battery and electric vehicle standards development.



Monday, June 15, 2015

Keynote Presentations



Plenary Session 1

Monday, June 15, 2015
8:30 AM – 12:00 Noon
Venue: Grand (Hubbard) Ballroom

Chair: Dr. John Miller, JNJ Miller plc
Co-Chair: Dr. Silva Hiti, Faraday Future

Welcome and Introduction

8:30 AM – 8:35 AM
Dr. Berker Bilgin, Program Chair, 2015 IEEE Transportation Electrification Conference & Expo

Keynote Presentation 1: Electrification Trends and Opportunities

8:35 AM – 9:05 AM

Speaker: Dr. Anand Sankaran, Chief Engineer & Executive Technical Leader - Energy Storage & HV Systems at Ford Motor Company

Short Biography: Dr. V. Anand Sankaran is the Executive Technical Leader & Chief Engineer of Energy Storage & HV Systems in the Electrified Powertrain Engineering Organization. His primary responsibilities include Electrification Technologies, namely, energy storage system, e-drive system, motors, inverters, converters, and high voltage electrical distribution systems.

He received his B.S. in Electrical Engineering from P.S.G. College of Technology, India, followed by M.S. and Ph.D. degrees in Electrical Engineering from University of South Carolina, Columbia. He also received an MBA from University of Michigan, Ann Arbor. He began his career as a Power Electronics Technical Specialist at Ford Research and Innovation Center in 1991. He then moved to product development and led the successful implementation of these new technologies in production programs, namely, "Escape Hybrid - the most fuel efficient SUV on the planet," "Fusion Hybrid - the most fuel efficient mid-size sedan in North America," Lincoln MKZ Hybrid, CMax Hybrid & Energi, Fusion Energi, and Focus Electric. He was named by Automotive News as one of the top 100 most influential leaders in electrification in 2011.

He has held various management positions in the electrification efforts at Ford Motor Company over the past several years.

Monday, June 15, 2015

Keynote Presentations

Keynote Presentation 2: Global Automotive Electrification Powertrain System Solutions: Today and Tomorrow

9:05 AM – 9:35 AM

Speaker: Denise Gray, Vice President Powertrain Electrification at AVL

Short Biography: Denise Gray currently holds the position of Vice President Powertrain Engineering - Electrification at AVL List GmbH, located in Graz, Austria. In this position Denise is responsible for leveraging AVL's Global capability in the development of engine, transmission, energy storage, electric drive, controls, test systems, and simulation tools, to provide Powertrain Electrification Engineering Services to the Industry. Her prior professional experience includes Vice President Business Development for an Electrified Powertrain Battery Startup Company in California. The majority of her career, nearly 30 years, was spent at General Motors. Vehicle Electrical Systems, Powertrain Engine and Transmission Controls and Electrified Powertrain Battery Systems, including the Chevy Volt Battery, were her core engineering responsibilities. Denise received her MS Engineering Degree from Rensselaer Polytechnic Institute and BS Electrical Engineering Degree from Kettering University.

Keynote Presentation 3: Automotive Electrification: The Non-Hybrid Story

9:35 AM – 10:05 AM

Speaker: Dr. Bruno Lequesne, President, E-Motors Consulting, LLC

Short Biography: Bruno Lequesne received the Certified-Engineer degree from the Ecole Supérieure d'Electricité, France, in 1978, and the PhD degree in electrical engineering from the Missouri University of Science and Technology, Rolla, MO, USA, in 1984. He worked for 30 years in the automotive industry on transportation electrification research before starting his own consultancy, E-Motors Consulting, LLC, in 2014. His automotive involvement includes working at General Motors Research Laboratories (1984-1999) and Delphi Research Laboratories (1999-2006). In September 2006, he moved to the Delphi Powertrain Division to manage a group within the Advanced Powertrain Engineering organization (2006-2009). After a year at the University of Alabama, he joined Eaton Corporate Research & Technology group to focus on the electrification of commercial vehicles (2010-2014). Since starting his consultancy, he has contributed to the automotive, aerospace and renewable energy industries, working on motors, actuators, and systems. Dr. Lequesne holds 49 patents with 4 more pending, primarily on sensors, linear actuators, and automotive applications. He is the recipient of ten Best Paper Awards, seven from the IEEE- Industry Applications Society (IAS), and three from the Society of Automotive Engineers, including the Colwell (2000) and the Bendix (2007) awards. He was elected an IEEE Fellow in 1997. He is also past president (2011-2012) of the IEEE IAS and is currently on the steering committee of the IEEE Transportation Electrification Community.

Monday, June 15, 2015

Keynote Presentations

Coffee Break

10:05 AM – 10:30 AM

Keynote Presentation 4: Effect of Vehicle Electrification in Improving Comfort and Safety

10:30 AM – 11:00 AM

Speaker: Dr. Tomy Sebastian, Director of Motor Drive Systems, Halla Mechatronics, President Elect, IEEE Industry Applications Society

Short Biography: Tomy Sebastian received the B.Sc. (Eng.) degree from Regional Engineering College Calicut (presently National Institute of Technology, Calicut), India, the M.S. degree from Indian Institute of Technology Madras, MA.Sc. and Ph.D. degrees from the University of Toronto, Canada. From 1979 to 1980, he was with the R & D Center of KELTRON, Trivandrum, India. From 1987 to 1992, he was with the Research and Applied Technology Division of Black and Decker Corporation, Towson, MD. From 1992 to 2013 with the Delphi Saginaw Steering Systems and Nexteer Automotive in Saginaw, Michigan, where his last responsibility was as the Chief Scientist at the Innovation Center. Currently he is the Director of Motor Drive Systems at Halla Mechatronics. He also taught several courses on Power Electronics, Motor Drives and Advances Motor Design at University of Toronto, Ontario, Canada, University of Maryland, College Park, Maryland, and The Ohio State University, Columbus, Ohio at various times. Dr. Sebastian has done extensive research in the area of permanent magnet motor design and control issues and applications in steering systems. He has published over 50 technical articles and holds 26 US patents. In 2003 he was elected as a Fellow of IEEE. During 2008-2009, he served as a distinguished Lecturer of IEEE Industry Applications Society. He was inducted in to the Delphi / Nexteer Innovation Hall of Fame in 2006. He is the recipient of the 2010 IEEE Industry Applications Society outstanding achievement award. He was the General Chair for the First IEEE Energy Conversion Congress and Exposition (IEEE ECCE 2009) held in San Jose, CA. He also served as Co- General Chair of the IEEE Power Electronics, Drives and Energy Systems (PEDES 2012) in Bengaluru, India. He is a member of the IAS board as the President Elect of the Society.

Monday, June 15, 2015

Keynote Presentations

Keynote Presentation 5: Towards model-based functional-safety-driven fault tolerance in automotive control systems implementation

11:00 AM – 11:30 AM

Speaker: Prof. Giorgio Rizzoni, Ford Motor Company Chair in Electromechanical Systems, Center for Automotive Research and Department of Mechanical and Aerospace Engineering, Ohio State University

Short Biography: Giorgio Rizzoni, the Ford Motor Company Chair in Electromechanical Systems, is a Professor of Mechanical and Aerospace Engineering and of Electrical and Computer Engineering, and Director of the Center for Automotive Research (an interdisciplinary research center supporting 50 full-time staff and 80 graduate students) at the Ohio State University. Dr. Rizzoni received B.S., M.S. and Ph.D. degrees in Electrical and Computer Engineering from the University of Michigan. His research interests include dynamics, control and diagnosis of automotive systems, with emphasis on hybrid and electric vehicles, and on energy conversion and storage systems. He has contributed to the development of a graduate curriculum in these areas, and has served as the director of three U.S. Department of Energy Graduate Automotive Technology Education Centers of Excellence. In 1999 Dr. Rizzoni established an automotive industry research consortium that today sees the participation of 20 automotive OEMs and suppliers; in 2008 he created the SMART@CAR consortium, focusing on plug-in vehicles and vehicle-grid technologies, with funding from 10 electric utility, automotive OEMS and electronics suppliers. Prof. Rizzoni is a Fellow of SAE (2005), a Fellow of IEEE (2004), and a recipient of the 1991 National Science Foundation Presidential Young Investigator Award.

Keynote Presentation 6: 3D Printing for Electric Traction Drive Systems

11:30 AM – 12:00 Noon

Speaker: Dr. Burak Ozpineci, Manager, Electric Drive Technologies, Oak Ridge National Laboratory

Short Biography: Burak Ozpineci received the B.S. degree in electrical engineering from Orta Dogu Technical University, Ankara, Turkey, in 1994, and the M.S. and Ph.D. degrees in electrical engineering from the University of Tennessee, Knoxville, TN, USA, in 1998 and 2002, respectively. He joined the Post-Masters Program with the Power Electronics and Electric Machinery Research Center, Oak Ridge National Laboratory (ORNL), Knoxville, TN, USA, in 2001 and became a Full-Time Research and Development Staff Member in 2002 and Group Leader of the Power and Energy Systems Group in 2008. He is currently leading the Power Electronics and Electric Machinery Group and Managing the Electric Drive Technologies Program at ORNL. He also serves as a Joint Faculty Associate Professor with The University of Tennessee, Knoxville. His research interests include system-level impact of wide bandgap power devices, multilevel inverters, power electronics for electric and hybrid electric vehicles, advanced manufacturing of power electronics, and wireless charging. Dr. Ozpineci is the Vice Chair of the IAS Transportation Systems Committee, was the Chair of the IEEE PELS Rectifiers and Inverters Technical Committee, and was Transactions Review Chairman of the IEEE Industry Applications Society Industrial Power Converter Committee. He received the 2006 IEEE Industry Applications Society Outstanding Young Member Award, 2001 IEEE International Conference on Systems, Man, and Cybernetics Best Student Paper Award, and 2005 UT-Battelle (ORNL) Early Career Award for Engineering Accomplishment. He was also a recipient of an R&D100 Award in 2014.

Poster Session 1

MONDAY JUNE 15

Poster Session 1: Power Electronics and Motor Drives **Session Chairs:** Dr. Fei Gao, University of Technology of Belfort-Montbeliard, France Dr. Matthias Preindl, MacAUTO, McMaster University, Canada	
Monday, June 15, 2015 12:00 PM – 2:00 PM *Venue: Great Lakes Center (Exhibit Hall)*	
PS1-1	**Power Factor Compensation Based Control Scheme for Permanent Magnet Synchronous Machine Drives** Hicham Chaoui[1], Amrane Oukaour[2], Hamid Gualous[2], and Pierre Sicard[3] *[1]Tennessee Technological University, USA, [2]University of Caen-Basse Normandie, France,[3]Universite du Quebec a Trois-Rivieres, Canada*
PS1-2	**A novel SVPWM Overmodulation Technique for three-level NPC VSI** Chengzhu Piao and John Y. Hung *Auburn University, USA*
PS1-3	**Research on Dual Redundancy Motor of Electro-Hydrostatic Actuator System** Bo Liang[1], Yuren Li[1], Bo Li[2], Yigeng Huangfu[1], and Dongdong Zhao[1] *[1]Northwestern Polytechnical University, China, [2]AVIC the first aircraft institute, China*
PS1-4	**Multi-frequency Inductive Power Transfer as a means to decouple Multi-coil Primary and Secondary Topologies** J. R. E. G. Prazeres[1], V. Prasanth[2], and P. Bauer[2] *[1]Applied Electronics BV, Netherlands, [2]Delft University of Technology, Netherlands*
PS1-5	**A Study on the Control of Output Current to Respond to the Load Changes of the Wireless Power Transfer** Jun-Ho Lee, Byung-Song Lee, Seung-Hwan Lee, and Kyung-Pyo Yi *Korea Railroad Research Institute, Korea*
PS1-6	**Investigation of Impact of Number of Phases in Interleaved dc-dc Boost Converter** Pierre Magne, Liu Ping, Berker Bilgin, and Ali Emadi *MacAUTO, McMaster University, Canada*
PS1-7	**A Hybrid ZVS Resonant Converter with Reduced Circulating Current and Improved Voltage Regulation Performance** Haoyu Wang *Shanghai Tech University, China*
PS1-8	**Fault-Tolerant Strategies for Double Three-Phase PMSM used in Electronic Power Steering Systems** Bruno Basler, Thomas Greiner, and Peter Heidrich *Pforzheim University, Germany*
PS1-9	**A Comparison Analysis of CLL and LLC Resonant Converter for Multi-phase Applications** Kerim Colak, Erdem Asa, and Dariusz Czarkowski *New York University, USA*

Poster Session 1

MONDAY JUNE 15

PS1-10	**A Novel Multi-Level Phase-Controlled Resonant Inverter with Common Mode Capacitor for Wireless EV Chargers** Erdem Asa, Kerim Colak, Mariusz Bojarski, and Dariusz Czarkowski *New York University, USA*
PS1-11	**Power Conversion for Environment Friendly Electrically Assisted Rickshaw Using Photovoltaic Technology in Bangladesh** Sheri Jahan Chowdhury, Rafiur Rahman, and AKM Abdul Malek Azad *BRAC University, Bangladesh*
PS1-12	**Performance Improvement of a Solid Rotor Line Start Permanent Magnet Motor by Copper Coating** Nima Farrokhzad Ershad *Texas A&M University, USA*
PS1-13	**Optimal Calculation Method for Control of Switched Reluctance Motor** Fei Peng, Jin Ye, Jianing Lin, and Ali Emadi *MacAUTO, McMaster University, Canada*
PS1-14	**An Asymmetric Three-Level Neutral Point Diode Clamped Converter for Switched Reluctance Motor Drives** Fei Peng, Jin Ye, and Ali Emadi *MacAUTO, McMaster University, Canada*
PS1-15	**Optimization and Safety Evaluation of a 3.3 kW Wireless EV Charger** Hai Jiang[1], Weihan Li[2], Mahmood Tabaddor[1], and Chris Mi[2] *[1]Underwriter Laboratories LLC, USA, [2]University of Michigan at Dearborn, USA*
PS1-16	**A Reduced-order Model based Induction Machine Self-Commissioning Method** Hao Ge[1], Jing Guo[1], Berker Bilgin[1], Jin Ye[1], Voiko Loukanov[2], and Ali Emadi[1] *[1]MacAUTO, McMaster University, Canada, [2]D&V Electronics Ltd, Canada*
PS1-17	**Simple Adaptive Fuzzy Logic Control Structure of Permanent Magnet Synchronous Machines** Hakim Teiar[1], Hicham Chaoui[2], and Pierre Sicard[1] *[1]Universite du Quebec a Trois-Rivieres, Canada, [2]Tennessee Technological University, USA*
PS1-18	**A Power Electronic Transformer (PET) with Multiport Bidirectional Resonant DC-DC Converters for Electric Traction Applications** Chunyang Gu, Zedong Zheng, and Yongdong Li *Tsinghua University, China*
PS1-19	**A Misalignment-Tolerant Wireless Power Transfer System for Transportation Applications** Konrad Woronowicz, Alireza Safaee, and Tim Dickson *Bombardier Transportation, Canada*
PS1-20	**Temperature Influenced Online Stator Resistance Estimation Using an Improved Swarm Intelligence Technique for Induction Machine** Eshaan Ghosh, Firoz Ahmed, Mahdi Mousavi Sangdehi, and Narayan C. Kar *University of Windsor, Canada*
PS1-21	**DC Ripple Current Rejection in a Bidirectional SiC Single-Phase AC-DC Converter for V2G application** Arjun raj prabu Andhra sridhar and Nathan Weise *Marquette university, USA*

Poster Session 1

PS1-22	**An Overview of a 50kW Inductive Charging System for Electric Buses** Hunter Hanzhuo Wu and Michael P. Masquelier *WAVE Inc., USA*
PS1-23	**Reliability and Cost Analysis of Different Power Inverter Topologies in Electric Vehicles** Dinesh Kumar Murugesan[1] and Ilaval Manickam[2] *[1]University of Colorado, Boulder, USA, [2]Texas A&M University, College Station, USA*
PS1-24	**Study of a Quasi Z-source Inverter and Permanent Magnet Synchronous Motor to Reduce Global Size of a More Electric Aircraft Actuator** Jérémy Cuenot[1,2], Sami Zaïm[1], Babak Nahid-Mobarakeh[2], Serge Pierfederici[2], Eric Monmasson[3], Régis Meuret[1], and Farid Meibody-Tabar[2] *[1]Labinal Power Systems, SAFRAN, France, [2]Universite de Lorraine, GREEN, France, [3]Universite de Cergy-Pontoise, SATIE, France*
PS1-25	**Modeling and Calculation of Key Design Parameters for an Inductive Power Transfer System using Finite Element Analysis - A Comprehensive Discussion** Kunwar Aditya[1], Bernardo Peschiera[2], Mohamed Youssef[1], and Sheldon Williamson[1] *[1]The University of Ontario-Institute of Technology, Canada, [2]Concordia University, Canada*

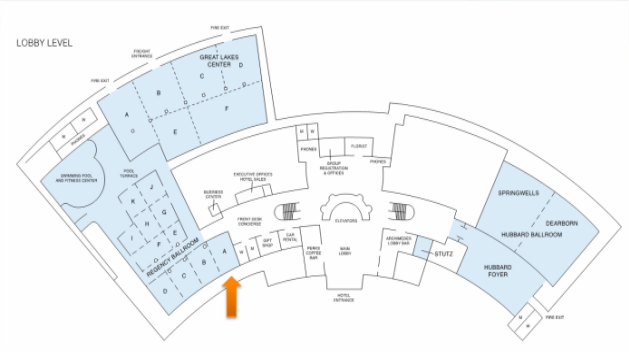
Monday, June 15, 2015

Afternoon Breakout Sessions

Tutorial 1: 48V Electrification Systems: An Overview of Belt Assisted Started Systems

Monday, June 15, 2015
2:00 PM – 3:20 PM
Venue: Regency A-B

Speaker: Dr. Sanjaka Wirasingha, Valeo



Tutorial Description: The "2025 fuel economy requirement" mandates that passenger cars and trucks in the U.S. deliver a fuel economy equivalent of 54.5 miles per gallon (mpg) by 2025, requiring automakers to make incremental changes in fuel efficiencies to reach a combined average target of 34.1 mpg within the next five years. Auto makers are exploring a multitude of solutions including weight reduction, smaller & more efficient engines, fuel sources, optimized aux loads and powertrain electrification. Electric propulsion is used to offset the fuel consumption in conventional powertrains by fully or partially replacing the ICE with a more efficient electric motor drive and recuperating energy through regenerative braking. A belt starter generator (BSG) system enables a vehicle to turn the engine off during inefficient operating points such as idle and other non-propulsion events, further improving fuel economy and reducing emissions. A 48V electrification system can be classified as a micro or mini HEV. It is essentially a combination of a high power starter and low power parallel hybrid having the ability to start the engine, provide electric assist, maintain regenerative braking and serve as a generator. In some rare instances, it also drives in EV mode. This presentation will provide a detail overview of the importance of vehicle electrification and the position of 48V BSG systems amongst the many electrification topologies/drivetrains. An overview of a BSG system including functional objectives, topologies, requirements and integration among other topics are provided followed by a detail review of key components of a BSG system. A high level summary of currently available BSG systems is also provided.

Speakers Short Biographies: Dr. Sanjaka G. Wirasingha received his Ph.D. degree in Electrical Engineering from Illinois Institute of Technology (IIT), Chicago, IL, USA in 2010. His Ph.D. dissertation was titled "System level analysis of PHEVs: classification, electrification, energy efficiency, and control strategies." Dr. Wirasingha has been actively involved in vehicle electrification for over 10 years in multiple capacities in research, academic, start-up and Industry roles. Dr. Wirasingha is an Adjunct Faculty member in the Department of Electrical and Computer Engineering at McMaster University, Hamilton, Ontario, Canada. He is the recipient of numerous awards including the Chrysler Innovation Award, 2014 Best Vehicular Electronics Paper Award by IEEE-VTS and US Patents.

Monday, June 15, 2015

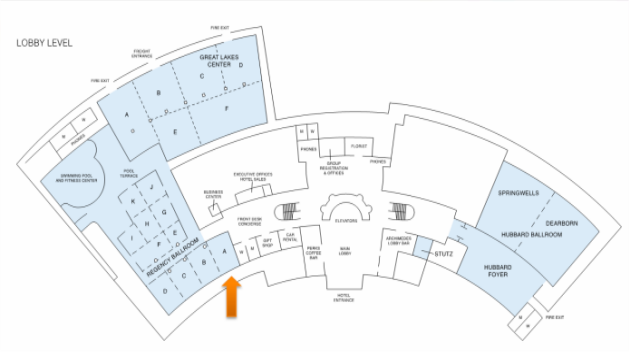
Afternoon Breakout Sessions

Tutorial 2: Regulatory Overview, Testing and Certification of Electrified Vehicles for Emissions and Fuel Economy

Monday, June 15, 2015

4:20 PM – 5:40 PM

Venue: Regency A-B



Speaker: Sashi Velnati FCA US LLC

Mahmoud Yassine, FCA US LLC

Tutorial Description: All major vehicle manufacturers are offering – or are planning to offer soon – a hybrid electric vehicle, a battery electric vehicle (BEV) or a plug -in -hybrid (PHEV) for sale in the US and international markets. This tutorial explains the methods and processes required to certify these advance technology vehicles with primary emphasis on three major elements: fuel economy, electric range or Equivalent All Electric Range (EAER) and tailpipe emissions. This tutorial will be divided in to the following sections: (i) A brief review of the current and new emissions and fuel economy regulations and fundamentals of emissions and fuel economy testing (ii) Applicability of these regulations and test procedures to the electrified vehicles with respect to the above three major elements (iii) Illustrations with test data from the three technologies presenting broad electric vehicle categories with different technologies covering the regulatory and certification aspects of electrified vehicles.

Speakers' Short Biographies: Sashi Velnati has worked for Chrysler (FCA) for 15 years in powertrain testing and powertrain development. He has spent over 5 years with Chrysler's electrified powertrain development team. Sashi was part of the powertrain team that certified Chrysler's first production Hybrid Electric vehicle and was part of the team that developed and certified Chrysler's first production Battery Electric Vehicle. Sashi also worked on powertrain development of Chrysler's Plug in Hybrid Electric Demo programs. Sashi has also worked for over 6 years at Chrysler's Emissions and Fuel Economy testing labs. Sashi currently works as Powertrain Integration Manager for B segment vehicles for FCA's international markets. Sashi has both his Bachelors and Masters in Mechanical Engineering and is currently pursuing an MBA.

Dr. Mahmoud Yassine is a Technical Fellow in emission test technology at Fiat Chrysler Automobiles (FCA). He has over twenty years of emission test technology experience. He has been working in the Emissions department at FCA for over 15 years. He received his Ph.D. in Mechanical Engineering with focus on diesel exhaust emissions from Wayne State University in 1995. He worked at Engelhard Corporation (now BASF) as a senior research engineer on diesel after-treatment development and testing. Dr. Yassine authored more than 20 technical publications related to emission testing and measurement. He represents FCA in many Industry forums including: USCAR – Automobile Industry / Government Emission Research (AIGER) Consortium, SAE, the Alliance of Automobile Manufacturers , the Coordinating Research council (CRC) and the Engine Manufacturers Association (EMA) on HD testing . He teaches a graduate level course on Internal Combustion Engines at Lawrence Technological University for the past 5 years.

Monday, June 15, 2015

Afternoon Breakout Sessions

Technical Session 1: Electric Motor Drives **Session Chairs:** Dr. Bin Wu, Mercedes-Benz R&D, USA Dr. Bing Cheng, FCA US LLC, USA	
Monday, June 15, 2015 **2:00 PM – 3:20 PM** *Venue: Regency J-K*	
TS1-1	**Optimizing Variable DC-link Voltage for an Induction Motor Drive under Dynamic Conditions** Srikanthan Sridharan and Philip T. Krein *University of Illinois at Urbana-Champaign, USA*
TS1-2	**Comparison of Apparent Power Consumption in Synchronous Reluctance and Induction Motors Under Vector Control** Alejandro Pina Ortega and Longya Xu *The Ohio State University, USA*
TS1-3	**Six-Phase Fault-Tolerant Permanent Magnet Motor Drives with Reduced Switch Counts: Topology Comparisons and Hardware Demonstration** Fan Wu[1,2], Ping Zheng[2], and Thomas Jahns[1] *[1]University of Wisconsin, Madison, USA, [2]Harbin Institute of Technology, China*
TS1-4	**Transient Performance Comparison of Switched Doubly-Fed Machine Propulsion Drives** Arijit Banerjee, Steven B. Leeb, and James L. Kirtley *Massachusetts Institute of Technology, USA*

Technical Session 2: Traction Motors: Design and Optimization **Session Chairs:** Dr. Lei Hao, General Motors, USA Dr. Rakib Islam, Nexteer Automotive, USA	
Monday, June 15, 2015 **4:20 PM – 5:40 PM** *Venue: Regency J-K*	
TS2-1	**Optimum Selection of Sintered NdFeB Magnet in terms of "Heavy Rare-earth Reduction Techniques (presentation-only)** Takashi Yawata *Shin-Etsu Chemical Co., Japan*
TS2-2	**Impact of Mechanical Stresses on the Magnetic Performance of Non-Oriented Electrical Steels and its Relation to Electric Machine Efficiency** Lode Vandenbossche[1], Sigrid Jacobs[2], Dennis Van Hoecke[1], and Emmanuel Attrazic[3] *[1]ArcelorMittal Global R&D Gent, Belgium, [2]ArcelorMittal Global R&D, Belgium, [3]ArcelorMittal Saint-Chély d'Apcher, France*
TS2-3	**Design Optimization of IPM Machines for Efficient Operation in Extended Speed Range** Alireza Fatemi, Nabeel A. O. Demerdash, and Dan Ionel *Marquette University, USA*
TS2-4	**Minimization of Torque Ripples of Interior Permanent Magnet Synchronous Motors by Particle Swarm Optimization Technique** Emrullah Aydin[1], Yingjie Li[2], Ilhan Aydin[3], Timur Aydemir[1], and Bulent Sarlioglu[2] [1]Gazi University, Turkey, [2]University of Wisconsin, Madison, USA, [3]Firat University, Turkey

Monday, June 15, 2015

Afternoon Breakout Sessions

Panel 1: Global Collaboration and Role of OEM and Suppliers in Making of Successful Electric Vehicles

Monday, June 15, 2015
2:00 PM – 3:20 PM
Venue: Regency C-D

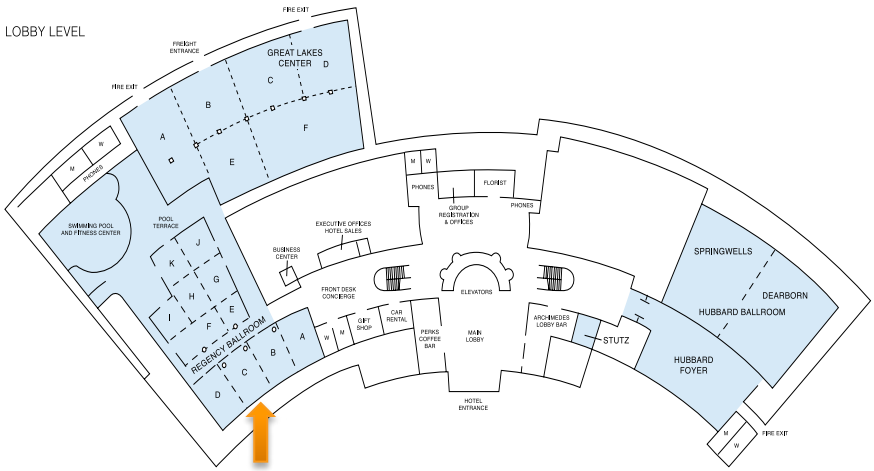
Panel Organizer and Moderator: Hossein Dadkhah, Manager, Electrified Powertrain, FCA US LLC

Panelists:

- Joe Palazzolo, Program Director eDrive, Chief Engineer eDrive, GKN Engineering Fellow, GKN Driveline, USA
- Ajay Lukha, Chief Commercial Officer (CCO), Yasa Motors, UK
- John Hayden, Senior Manager, Automotive Systems, Toshiba International Corporation, USA
- Brian Peaslee, Chief Engineer Magna Powertrain

Panel Summary: This panel will discuss the importance of close collaboration between suppliers and automotive OEMs to develop successful electric vehicles. Some of the aspects that will be discussed in this panel include:

- Electrified Propulsion Vehicle Requirements
- Electrified Powertrain Architecture
- Regulations
- Torque Security, Vehicle Safety, Communication (V2V, V2I), Entertainment etc.
- Product Portfolio of suppliers to meet OEM demands
- Adaptability of supplier product to support multiple vehicle platforms
- Technical Innovation from suppliers to reduce system demand
- Cost Volatility/ Cost increase



Monday, June 15, 2015

Afternoon Breakout Sessions

Panel 2: Connected Electrified Vehicles and Cybersecurity

Monday, June 15, 2015
2:00 PM – 3:20 PM
Venue: Regency E-F

Panel Organizer: Omer C. Onar, Oak Ridge National Laboratory

Moderator: Joachim Taiber, Professor, Clemson University iCAR Center

Panelists:

- Andreas Malikopoulos, Center for Transportation Analysis, Oak Ridge National Laboratory
- Tao Zhang, Chief Scientist, Cisco
- Kevin Heaslip, Professor, Transportation Infrastructure and Systems Engineering, Virginia Tech.
- Walton Fehr, Program Manager, System Engineering, US Department of Transportation

Panel Summary: The development and deployment of a fully connected transportation system that makes the most of multi-modal, transformational applications requires a robust, underlying technological platform. The platform is a combination of well-defined technologies, interfaces, and processes that, combined, ensure safe, stable, interoperable, reliable system operations that minimize risk and maximize opportunities. The primary application area of connected vehicles is the vehicle safety. These applications are designed to increase situational awareness and reduce or eliminate crashes through vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) data transmission that supports: driver advisories, driver warnings, and vehicle and/or infrastructure controls. These technologies may potentially address a great majority of crash scenarios with unimpaired drivers, preventing tens of thousands of automobile crashes every year. Since V2V and V2I communications and a significant data processing are involved, the connected vehicles concept also requires resiliency and immunity for cyber security issues. This panel session will discuss technology, applications, dedicated short range communications (DSRC) technology and capabilities, policy and institutional issues, and international research on the subject matter.

Monday, June 15, 2015

Afternoon Breakout Sessions

Panel 3: Functional Safety – Its Challenge and Implication with the Development of Electric Vehicles

Monday, June 15, 2015
2:00 PM – 3:20 PM
Venue: Regency G-H

Panel Organizer and Moderator: Hong Yang, Manager, Battery Management Systems Control & Software, FCA US LLC

Panelists:

- Jason McConnell, Business Unit Director at IAV Automotive Engineering
- Deepa Ramaswamy, Director of Engineering, Battery Management Systems at LGCPI
- Ahmad Nasser, Sr Manager, NA Quality & Global Functional Safety at Magna Electronics
- Joseph D. Miller, Chief Engineer, Systems Safety, TRW Automotive
- Michael W. Runyon, Manager, Embedded System Quality, FCA US LLC

Panel Summary: This panel session aims at bringing together diverse disciplines engaged in functional safety for the development of vehicle electrification systems, and providing a platform for experts in vehicle's safety system and ISO26262 standard to share experiences and challenges when implementing this standard for the development of vehicle electrification systems. This session contains specialist presentations/speech on functional safety methodology, safety concepts and safety analyses, implementation and interpretation of ISO 26262. Process management and organizational aspects of ISO262 will also be discussed.

Monday, June 15, 2015

Afternoon Breakout Sessions

Panel 4: Mild Hybrid – Developing Optimal Performance/Cost Ratio System Configurations and Standardize Technical Solutions for Mass Production

Monday, June 15, 2015
4:20 PM – 5:40 PM
Venue: Regency C-D

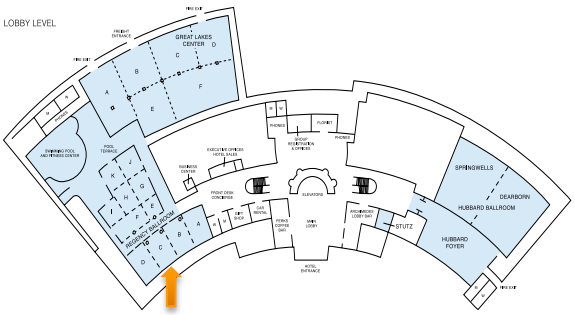
Panel Organizer: Beijing Wang, Electrified Powertrain e-Motor Group, FCA US LLC

Moderator: Sachin A. Bhide, Electrified Powertrain Architecture, FCA US LLC and Baiming Shao, Mercedes-Benz, Research & Development

Panelists:

- Peter Savagian, General Director, Electrification Systems and Electric Drive Engineering, General Motors
- Brian Peaslee, Chief Engineer, Magna Electronics, USA
- Gurunath Kedar-Dongarkar, Electrified Powertrain Vehicle Architecture and Simulation Lead, FCA US LLC
- Heiko Weller, VP Engineering – Gasoline Systems, Robert Bosch LLC

Panel Summary: Driven by stricter mandatory regulations on fuel economy improvement and CO2 reduction, market penetration of electrified vehicles will increase in the next 10 years, among which mild hybrid will become a leading sector in growth. Researchers forecast the sales of mild hybrid vehicles will reach 1.4 million units per year by 2020, and 7 million units by 2024. Compared to a full hybrid, a plug-in hybrid or an electric vehicle, a mild hybrid system stands out due to its maximum benefit/cost ratio. Major automotive OEMs and suppliers are heavily investing in mild hybrid system development and platform integration. There are different kinds of mild hybrid system architectures, multiple available motor technologies, various challenges in inverter design particularly under low voltage/high current operating conditions, in addition to a battery pack/ battery management system and a DC/DC converter. This panel will focus on mild hybrid systems and discuss how to develop optimal performance/cost ratio system configurations and standardize technical solutions for mass production.



Monday, June 15, 2015

Afternoon Breakout Sessions

Panel 5: Battery Management Technology in Automotive Applications

Monday, June 15, 2015
4:20 PM – 5:40 PM
Venue: Regency E-F

Panel Organizer and Moderator: Wencong Su, University of Michigan at Dearborn

Panelists:

- Deepa Ramaswamy, Director of Engineering – Battery Management Systems at LG Chem Power
- Anna G. Stefanopoulou, Professor of Mechanical Engineering, Automotive Research Center Director, University of Michigan, Ann Arbor
- Zhen Chen, Professor, Kunming University of Science and Technology
- Zhimin Xi, Assistant Professor, Industrial and Manufacturing Engineering, University of Michigan-Dearborn
- Gitanjali DasGupta, Cleantech Expert & Global Strategist, Disruptive Technologies

Panel Summary: Today's electric vehicle batteries are expensive and prone to unexpected failure. Batteries are complex systems, and developing techniques to cost-effectively monitor and manage important performance measures while predicting battery failure remains a key technological challenge. As battery technology continues to grow very quickly, it is important to also focus on improving the performance of the battery management technology to make the battery a safe, reliable, and cost efficient solution. This panel will discuss the challenges and opportunities of the battery management technology in automotive applications.

Monday, June 15, 2015

Afternoon Breakout Sessions

Panel 6: Advancements in Energy Management and Controls for Electric Vehicles

Monday, June 15, 2015
4:20 PM – 5:40 PM
Venue: Regency G-H

Panel Organizer: Mohamad Berri, Ford Motor Company

Moderator: Yi Lu Murphy, ECE Department Chair, University of Michigan

Panelists:

- Andreas Malikopoulos – Center for Transportation Analysis, Oak Ridge National Laboratory
- Chang Liu, Senior Project Engineer, Department of Powertrain Embedded Controls, General Motors
- Dyche Anderson, Technical Expert, Advanced Battery Controls R&A, Ford Motor Company
- Le Yi Wang, Professor, Wayne State University

Panel Summary: The performance of the hybrid (HEV), plug-in hybrid (PHEV), battery electric vehicle (BEV) are directly linked to the control systems and energy management distribution in the vehicle. In this panel, the emerging battery technologies of the HEV, PHEV, and BEV will be discussed. In addition, the advancement of the energy management and controls for electric vehicles with various scientific disciplines for this technology will be discussed in detail.

IEEE Transportation Electrification Committee Workshops and Conferences Committee Meeting

Monday, June 15, 2015
5:40 PM – 6:30 PM
Venue: Regency I

Chair: Dr. Kaushik Rajashekara, University of Texas at Dallas

Monday, June 15, 2015
Technical Committee Meeting

Joint PELS/IAS Technical Committee Meeting

Monday, June 15, 2015
6:30 PM – 8:00 PM
Venue: Regency C-D

Agenda

IEEE Transportation Electrification Community (TEC)
6:30 PM – 6:45 PM
TEC Chair: Dr. Phil Krein, University of Illinois at Urbana-Champaign

ITEC Strategic Plan and Vision
6:45 PM – 7:00 PM
ITEC Steering Committee Chair: Dr. 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 – 7:15 PM
TC Chair: Dr. Anand Sathyan, Fiat Chrysler Automobiles (FCA) US LLC

Committee Meeting of the IEEE Industry Applications Society (IAS) Transportation Systems Committee
7:15 PM – 7:30 PM
TC Chair: Dr. Ayman El-Refaie, General Electric

ITEC 2016 Presentation
7:30 PM – 8:00 PM
General Chair ITEC'16: Dr. Berker Bilgin, McMaster 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.

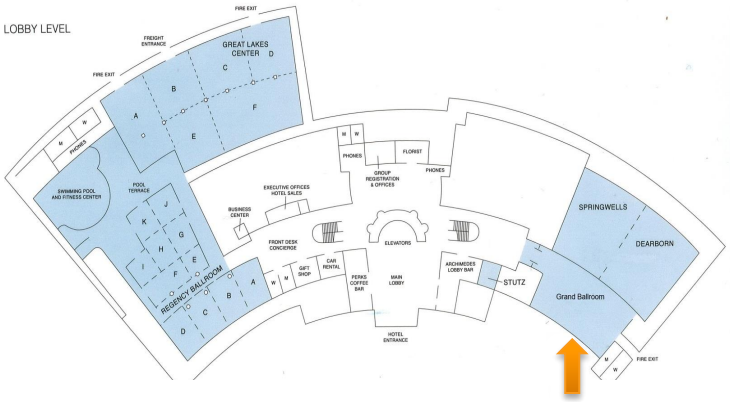
Please attend this joint meeting if you are interested in getting more involved with the activities of IEEE-PELS and/or IEEE-IAS (e.g., ITEC, other conferences, workshops, publications, awards, etc.).

Tuesday, June 16, 2015

Keynote Presentations

Plenary Session 2

Tuesday, June 16, 2015
8:30 AM – 12:00 Noon
Venue: Grand (Hubbard) Ballroom



Chair: Julian Styles, GaN Systems
Co-Chair: Dr. Sanjaka Wirasingha, Valeo

IAS 50th Anniversary Presentation

8:30 AM – 8:40 AM
Dr. Tomy Sebastian, President Elect, IEEE Industry Applications Society

Keynote Presentation 1: 787 More Electric Power Systems and Future Trends in More-electric Airplanes

8:40 AM – 9:10 AM

Speaker: Dr. Kamiar Karimi, Senior Technical Fellow, Boeing

Short Biography: Kamiar Karimi received his B.S., Master of Engineering, and PhD. degrees in Electrical Engineering from Cornell University in 1981, 1982, and 1986 respectively. From 1986-89 he worked for Landis and Gyr Systems in San Jose, CA where he was in charge of performing research in the area of Energy Management Systems.
Since 1989 he has been with The Boeing Company. He has led system analysis and modeling for the Space Station Power System, and has been involved in design, analysis, and validation of various airplane electric power systems including 747/767/777, and 787. He is one of the architects of the 787 More-Electric systems and is responsible for developing many of the new technologies for 787 electrical power system. Currently he is leading multiple research projects related to aircraft architecture optimization, power conversion technology, and simulation of large complex dynamical systems. He is a Senior Technical Fellow at Boeing.

Tuesday, June 16, 2015

Keynote Presentations

Keynote Presentation 2: Future Trends for Electrification of Commercial Aircraft – From e-taxi to electric propulsion!

9:10 AM – 9:40 AM

Speaker: Dr. Bulent Sarlioglu, Associate Director, Wisconsin Electric Machines and Power Electronics Consortium (WEMPEC), University of Wisconsin-Madison

Short Biography: Dr. Bulent Sarlioglu is a Professor at University of Wisconsin–Madison, and Associate Director of Wisconsin Electric Machines and Power Electronics Consortium (WEMPEC). He received the Ph.D. degree from University of Wisconsin–Madison, M.S. degree from University of Missouri–Columbia, and B.S. degree from Istanbul Technical University, all in electrical engineering. Dr. Sarlioglu spent more than ten years at Honeywell's aerospace division, most recently as a staff systems engineer, earning Honeywell's technical achievement award in 2003 and an outstanding engineer award in 2011. He contributed many internally and externally funded R&D programs including for Boeing Sonic Cruiser and 7E7. He worked on many technology development programs for many platforms including Airbus A350 and A380. His current research interests include novel electric machines, high-speed electric machines, and wide bandgap device based power electronics. He is the editor of the IEEE Electrification Magazine for electric airplane. Currently, he is the vice-chair of PELS Technical Committee on Vehicle and Transportation Systems and the secretary of the IAS Transportation Systems Committee. Dr. Sarlioglu is the inventor or co-inventor of sixteen US patents.

Keynote Presentation 3: Electro-Hydraulic Actuation Systems (EHA) for the More Electric Aircraft"

9:40 AM – 10:10 AM

Speaker: Dr. Saeid Habibi, Director of the Centre for Mechatronics and Hybrid Technologies, McMaster University

Short Biography: Dr. Saeid Habibi is a Senior NSERC Industrial Research Chair and a former Chair of the Department of Mechanical Engineering at McMaster University. He is also the founder and the Director of the Centre for Mechatronics and Hybrid Technologies, a research Centre working on hybrid electric vehicles and flight control actuation systems. His academic background includes research into intelligent control, state and parameter estimation, fault diagnosis and prediction, Variable Structure Systems, actuation systems, mechatronics and fluid power. The application areas for his research have included automotive, aerospace, water distribution, and robotics. Dr. Habibi has considerable managerial and industrial experience. He spent a number of years in industry as a Project Manager and Senior Consultant for Cambridge Control Ltd, U.K., where he was involved in automotive and aerospace related projects. In Canada, he spent a number of years at AlliedSignal Aerospace (presently part of Honeywell). He has developed his own theory related to fault detection and diagnosis referred to as the Smooth Variable Structure Filter (SVSF) and, has been involved in research on signal-based strategies involving PCA and wavelets. He has been the recipient of a number of awards. He and his colleagues received the 2012 Best Paper Prize from IEEE Transportation Electrification Conference for the application of their SVSF theory to condition monitoring of battery cells. He received 2 corporate awards for his contributions to the AlliedSignal Systems Engineering Process in 1996 and 1997. He was the recipient of the Institution of Electrical Engineers (IEE) F.C. Williams best paper award in 1992 for his contribution to the Variable Structure Systems theory. Dr. Habibi is a Fellow of ASME and a member of the ASME Fluid Power Systems Technology (FPST) division executive committee. He has served on the Editorial Boards of the Journal of Dynamic Systems Measurement and Control of the American Society of Mechanical Engineers (ASME) as well as the Transactions of the Canadian Society of Mechanical Engineers (CSME).

Tuesday, June 16, 2015

Keynote Presentations

Coffee Break

10:10 AM – 10:30 AM

Keynote Presentation 4: Fundamental Challenges in Transportation Electrification, from Aircraft to Watercraft and Everything in Between

9:10 AM – 9:40 AM

Speaker: Dr. Philip Krein, Professor and Director of the Grainger Center for Electric Machinery and Electromechanics, University of Illinois at Urbana-Champaign

Short Biography: Philip T. Krein received the B.S. degree in electrical engineering and the A.B. degree in economics and business from Lafayette College, Easton, Pennsylvania, and the M.S. and Ph.D. degrees in electrical engineering from the University of Illinois, Urbana. He was an engineer with Tektronix in Beaverton, Oregon, and then returned to the University of Illinois at Urbana-Champaign. At present, he holds the Grainger Chair in Electric Machinery and Electromechanics. His research interests address all aspects of power electronics, machines, drives, and electric transportation, with emphasis on nonlinear control and distributed systems. He published an undergraduate textbook, Elements of Power Electronics (Oxford University Press, second edition, 2015). In 2001, he helped initiate the International Future Energy Challenge, a major student competition involving fuel cell power conversion and energy efficiency. He holds twenty-nine U.S. patents with additional patents pending. Dr. Krein is a registered professional engineer in Illinois and in Oregon. He was a senior Fulbright Scholar at the University of Surrey in the United Kingdom in 1997-98. He serves as Academic Advisor for the Department of Electronic and Information Engineering at Hong Kong Polytechnic University. In 2003, he received the IEEE William E. Newell Award in Power Electronics. He is a past President of the IEEE Power Electronics Society, and served as a member of the IEEE Board of Directors. He is Editor-At-Large of the IEEE Transactions on Power Electronics and an Associate Editor of the IEEE Journal of Emerging and Selected Topics in Power Electronics. In 2015, he is Chair of the IEEE Transportation Electrification Community.

Tuesday, June 16, 2015

Keynote Presentations

Keynote Presentation 5: More Electric Transport – Activities in the UK

11:00 AM – 11:30 AM

Speaker: Dr. Volker Pickert, Head of the Electrical Power Research Group, Newcastle University, United Kingdom

Short Biography: Prof. Pickert is Head of the Electrical Power Research Group at Newcastle University, UK, coordinating 100 academic staff, research associates and PhD students. He has 20 years industrial and academic experiences in power electronics and electric drives for electric vehicles and hybrid electric vehicles. He studied Electrical and Electronic Engineering at the RWTH Aachen, Germany, and Cambridge University, UK, and after receiving his PhD from Newcastle University he worked in Germany for Semikron as Product Manager and for Volkswagen as R&D group head for electric power drive train development. In 2003 he returned back to academia where he joined Newcastle University. Prof Pickert published over 100 papers, is the Editor-in-Chief of the IET Power Electronics Journal, is the recipient of the Denny Medal from IMarEST for contribution on power factor corrections, was the IET Technical Advisor for TTXGP - World's First Zero Carbon, Clean Emission Electric Bike Grand Prix in 2009 and is the theme leader for Greener Transport at Newcastle University.

Keynote Presentation 6: Electrified Vehicles and Li-ion Batteries – Are we there yet?

11:30 AM – 12:00 Noon

Speaker: Dr. Prabhakar Patil, CEO, LG Chem Power

Short Biography: Dr. Prabhakar Patil is chief executive officer (CEO) of LG Chem Power, Inc. (LGCPI), the North American subsidiary of lithium-ion battery-maker, LG Chem (LGC), Korea. In this position, he has overall responsibility for the strategic direction and engineering operations of the company. Prior to joining LGCPI in 2005, Dr. Patil spent 27 years at Ford Motor Company, most notably as chief engineer for Ford's Hybrid Technologies during 2003 and chief engineer for the Ford Escape Hybrid from 1998 to 2003. Dr. Patil earned his PhD in Aerospace Engineering from The University of Michigan, Ann Arbor. He received the Henry Ford Technology Award in 1991 for his work in Electric Vehicle Powertrain Development and was elected a Fellow by the Society of Automotive Engineers (SAE) in 2007.

TUESDAY JUNE 16

Poster Session 2

Poster Session 2: Vehicle Powertrains and Energy Storage
Session Chairs:
Dr. Babak Nahid-Mobarekeh, University of Loraine, France
Dr. Alexandre De Bernardinis, IFSTTAR Versailles, France

Tuesday, June 16, 2015
12:00 PM – 2:00 PM
Venue: Great Lakes Center (Exhibit Hall)

PS2-1	**Development of a DC-Link Protection System for Regenerative Braking of Electric Vehicle using a Pseudo-Cascade Controlled IGBT Chopper** Maxime Berger, Olivier Cote, and Ahmed Chebak *University of Quebec at Rimouski, Canada*
PS2-2	**An Optimization Model for a Battery Swapping Station in Hong Kong** Tony Hao Wu[1], Grantham Kwok-Hung Pang[1], K.L. Choy[2], and H.Y. Lam[2] *[1]The University of Hong Kong, Hong Kong, [2]The Hong Kong Polytechnic University, Hong Kong*
PS2-3	**Investigation of Thermal Energy Losses in the Powertrain of an Electric City Bus** Antti Lajunen and Antti Kalttonen *Aalto University, Finland*
PS2-4	**Multiple Cell Lithium-Ion Battery System Electric Fault Online Diagnostics** Bing Xia[1], Zheng Chen[2], Chris Mi[1], and Brian Robert[3] *[1]University of Michigan Dearborn, USA , [2] Kunming University of Science and Technology, China, [3]Ford Motor Company, USA*
PS2-5	**A Novel State-of-Charge Estimation Method for Lithium-Ion Battery Pack of Electric Vehicles** Zheng Chen[1], Bing Xia[2], and Chris Mi[2] *[1]Kunming University of Science and Technology, [2]University of Michigan Dearborn, USA*
PS2-6	**Development of Current Squared - Time Curves for Simplified Wire Size Selection for Electric Traction Systems in Automotive Applications** Eduardo Marquez and Douglas Nelson *Virginia Tech, USA*
PS2-7	**Increasing EV Public Charging with Distributed Generation in the Electric Grid** Danielle Meyer, JongChan Choi, and Jiankang Wang *The Ohio State University, USA*
PS2-8	**Fuel consumption effects of a Diesel hybrid electric vehicle across a range of driving styles and ambient conditions** Forrest Jehlik[1], Eric Rask[1], Sebastien Magand[2], and Eric Condemine[2] *[1]Argonne National Laboratory, USA, [2]IFP Energies Nouvelles, France*
PS2-9	**State-of-Charge and State-of-Health Prediction of Lead-Acid Batteries with Genetic Algorithms** Hicham Chaoui[1], Suruz Miah[2], Amrane Oukaour[3], and Hamid Gualous[3] *[1]Tennessee Technological University, USA, [2]University of Ottawa, Canada, [3]University of Caen-Basse, France*
PS2-10	**Application of Housing Peak Shaving (HPS) algorithms with Plug-in Hybrid Electric Vehicles (PHEVs): Impacts on the Aging Rate of Low Voltage Transformer** Harun Turker and Seddick Bacha *Grenoble Electrical Engineering Lab, France*

Poster Session 2

PS2-11	**Methodology Hybridization of a Vehicle** Harun Turker *Grenoble Electrical Engineering Lab, France*
PS2-12	**Sensitivity Analysis of Kalman Filter Based Capacity Estimation for Electric Vehicles** Weizhong Wang[1], Jin Ye[1], Pawel Malysz[2], Hong Yang[2], and Ali Emadi[1] *[1]MacAUTO, McMaster University, Canada, [2]Fiat Chrysler Automobiles , USA*
PS2-13	**Online estimation of state-of-charge of Li-ion batteries using an Iterated Extended Kalman Particle Filter** Daming Zhou[1,2], Alexandre Ravey[1], Fei Gao[1], Damien Paire[1], Abdellatif Miraoui[1], and Ke Zhang[2] *[1]Universite de Technologie de Belfort-Montbeliard, France, [2]Northwestern Polytechnical University, China*
PS2-14	**Generic Methodology For Driving Range Estimation of Electric Vehicle With On-Road Charging** Aditya Shekhar, Venugopal Prasanth, Pavol Bauer, and Mark Bolech *Delft University of Technology, Netherlands*
PS2-15	**Assessment of Distribution System Margins to Accommodate the Penetration of Plug-in Electric Vehicles** Abdullah S. Bin Humayd and Kankar Bhattacharya *University of Waterloo, Canada*
PS2-16	**48V Recuperation Storage Including a Stabilizing 12V Tap for HEVs** Andreas Baumgardt and Dieter Gerling *Universitaet der Bundeswehr Muenchen, Germany*
PS2-17	**A Novel Battery/ Ultracapacitor Hybrid Energy Storage System Analysis based on Physics-Based Lithium-Ion Battery Modeling** Ran Gu[1], Pawel Malysz[2], and Ali Emadi[1] *[1]MacAUTO, McMaster University, Canada, [2]Fiat Chrysler Automobiles, USA*
PS2-18	**Control of PHEV Charging Facilities Integrated with Small Scale Wind Turbine** Preetham Goli and Wajiha Shireen *University of Houston, USA*
PS2-19	**"Journey Mapping" - A New Approach for Defining Automotive Drive Cycles** Kavya Prabha Divakarla, Ali Emadi, and Saiedeh Razavi *McMaster University, Canada*
PS2-20	**Smart Scheduling of PHEVs in PV Integrated Charging Facilities Based on DC Link Voltage Sensing** Preetham Goli and Wajiha Shireen *University of Houston, USA*
PS2-21	**Hybrid Energy Storage Systems in Electric Vehicle** Geng Niu[1], Alejandro Pozo Arribas[1], Mohamad Salameh[1], Mahesh Krishnamurthy[1], and Jose M. Garcia[2] *[1]Illinois Institute of Technology, USA, [2]Purdue University, USA*

Poster Session 2

PS2-22	**A Bellman-Ford Approach to Energy Efficient Routing of Electric Vehicles** Rami Abousleiman and Osamah Rawashdeh *Oakland University, USA*
PS2-23	**Energy Consumption Model for an Electric Vehicle** Rami Abousleiman and Osamah Rawashdeh *Oakland University, USA*
PS2-24	**Split-Parallel Through-the-Road Hybrid Electric Vehicle: Operation, Power Flow and Control Modes** Saiful Zulkifli *Universiti Teknologi PETRONAS, Malaysia*
PS2-25	**A new Approach for Management of Battery Storage Systems for Mobile and Stationary Applications** Morgan Kiani and Jacob Evans *Texas Christian University, USA*

Tuesday, June 16, 2015

Afternoon Breakout Sessions

Tutorial 3: Electric Motor and Transformer Noise Modeling

Tuesday, June 16, 2015

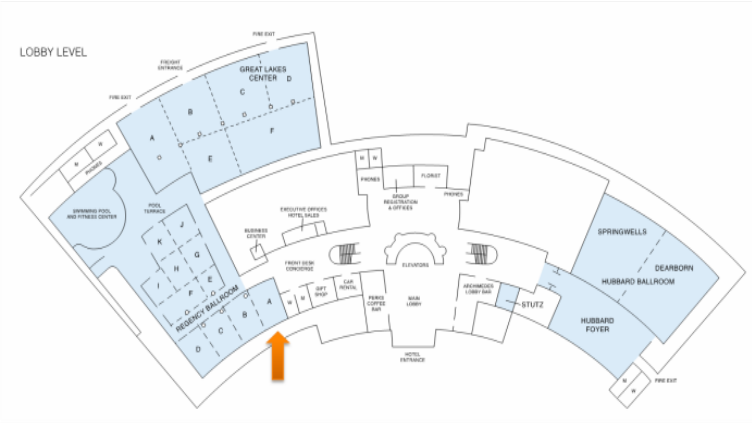
2:00 PM – 3:20 PM

Venue: Regency A-B

Speaker: Karthik Balachandran, Siemens LMS

Tutorial Description: Noise due to electrical machines are coming under scrutiny either due to regulation requirements or as a differentiator between two identical products. Electrical machines are ubiquitous in our modern society, be it in a tooth brush or a large vehicle. Regulations regarding transformer noise, especially when installed in the vicinity of heavily populated areas, are another issue OEM's have to deal with. The tutorial is in two parts with the first part dealing with electric motors and the second part with transformers. The mechanisms causing the electric motors to be noisy will be discussed along with solutions. Demonstrations involving the simulation of noise will be performed using Siemens PLM Software.

Speaker Short Biography: Karthik Balachandran is currently employed as a pre-sales solutions consultant at Siemens PLM software Inc. Karthik is an Acoustics Engineer with over 10 years of experience having worked at General Electric and Siemens. Since joining Siemens PLM Software Inc. (formerly LMS International), Karthik has been involved in Customer Support, Marketing and Sales of Virtual.Lab Software. He has visited several countries and presented in many forums on the use of Virtual.Lab software for simulating noise.



Tuesday, June 16, 2015

Afternoon Breakout Sessions

Tutorial 4: Evolution of Electric Motor Designs and Controls for GM's EV and HEV Applications

Tuesday, June 16, 2015
4:20 PM – 5:40 PM
Venue: Regency A-B

Speaker: Nitin Patel, Senior Manager, General Motors

Tutorial Description: GM's Electrification engineering staff has been developing high performance Electric drive systems for over past two decades. As a result, GM's internally developed, designed and built Electric Motors and Motor controls algorithms have been used in GM's production vehicles starting form early days of EV1 to the latest EREV Volt vehicles. While EVs/HEVs are gaining popularity in hopes of addressing cleaner and energy sustainable technology in transportation, materials sustainability and rare earth dependence mitigation must be addressed in lieu of recent price hike and instability in Heavy Rear Earth materials supply. Providing cost effective, light weight, high efficient Electric Drive system with design robustness to the material cost volatility is crucial in automotive industry success and therefore designing electric propulsion to minimize or eliminate rare earth usage plays a major role in EVs/ HEVs success. Additionally, GM is technical leader in developing and designing bar wound stator to sustain high power at high speed range while improving cooling of the stator conductors. The first application of the bar wound stator technology was introduced in 2008 2-mode production vehicles. Developing and applying robust Electric Motor Controls is equally important to provide high performance Electric drive systems. Dynamic stiffness of the control loops is essential to provide quick acceleration /deceleration to facilitate system mode change and vehicle dynamics, while adapting to the variations of the operating conditions such as DC bus voltage, Road load, temperature, etc. State of the art technologies in the area of motor design and motor controls have enabled designing the next generation propulsion systems at GM. The next generation production vehicles will be equipped with the enhanced electric motors and controls providing improved fuel economy and EV range.

Speaker's Short Biography: Nitin R. Patel received the B.Sc. degree from the University of Poona, India in 1991, the M.S. degree in Electrical Engineering from the University of Tennessee, Knoxville in 1996, and the M.S. degree in Mechanical Engineering from the University of Wisconsin, Madison in 2004.

Since 1997 he has been with Electrification group at General Motors where he has held various positions. Currently as a Senior Manager, he is responsible for Electric motor design engineering, Design and Release engineering, Motor Controls engineering, Motor Calibration engineering and Motor Software engineering groups. His research interests are in developing Electric motors and AC Drive controls for propulsion systems for FCEV, EV and HEV applications. He has authored several publications in IEEE conferences and journals. He holds over 50 US patents. He also was awarded Two General Motors Vice President's awards and One Boss Kettering award.

Tuesday, June 16, 2015

Afternoon Breakout Sessions

Technical Session 3: Vehicle Powertrain **Session Chairs:** Dr. Yinye Yang, McMaster University, MacAUTO, Canada Dr. Baiming Shao, Mercedez-Benz R&D, USA	
Tuesday, June 16, 2015 **2:00 PM – 3:20 PM** *Venue: Regency J-K*	
TS3-1	**Testing Vehicle Power and V2G applications: Key Considerations for Test Equipment (presentation-only)** Martin Weiss *NHR*
TS3-2	**Ground Fault Protection for Automotive and Industrial Applications (presentation-only)** Amir Mojtahed *Bender Canada Inc. Canada*
TS3-3	**An Energy Management Strategy for an EV with Two Propulsion Machines and a Hybrid Energy Storage System** Junyi Shen and Alireza Khaligh *University of Maryland, USA*
TS3-4	**Modeling and Control of Power-Split Powertrains: Examining the Influence of Drive-Shaft Compliance** Sriganesh Sriram and David Taylor *Georgia Institute of Technology, USA*

Technical Session 4: Thermal Monitoring and Management **Session Chairs:** Dr. Srihari Gangaraj, General Motors, USA Dr. Antti Lajunen, Aalto University, Finland	
Tuesday, June 16, 2015 **4:20 PM – 5:40 PM** *Venue: Regency J-K*	
TS4-1	**Thermal Management during Stalled Rotor by Conduction loss Redistribution** Syed Qaseem Ali, Subhadeep Bhattacharya, Diego Mascarella, and Geza Joos *McGill University, Canada*
TS4-2	**Thermal Real-Time Monitoring of a Gearbox Integrated Electric Rear Axle Drive for Hybrid Electric Traction** Christian Paar[1] and Annette Muetze[2] *[1]Magna Powertrain, Austria, [2]Graz University of Technology, Austria*
TS4-3	**Effects of cell geometry on thermal management in air-cooled battery packs** Dylan Erb[1], Eric Carlson[2], Isaac Ehrenberg[1], and Sanjay Sarma[1] *[1]Massachusetts Institute of Technology, USA, [2]Boston-Power, USA*
TS4-4	**Size matters: Why cell size is vital for minimizing cost of air-cooling in battery packs** Dylan Erb[1], Eric Carlson[2], Sumeet Kumar[1] and Sanjay Sarma[1] *[1]Massachusetts Institute of Technology, USA, [2]Boston-Power, USA*

Tuesday, June 16, 2015

Afternoon Breakout Sessions

Panel 7: Challenges and Advancements in the Development of Real-time Modeling and Simulation of HEV/PHEV/EV Components and Systems

Tuesday, June 16, 2015
2:00 PM – 3:20 PM
Venue: Regency C-D

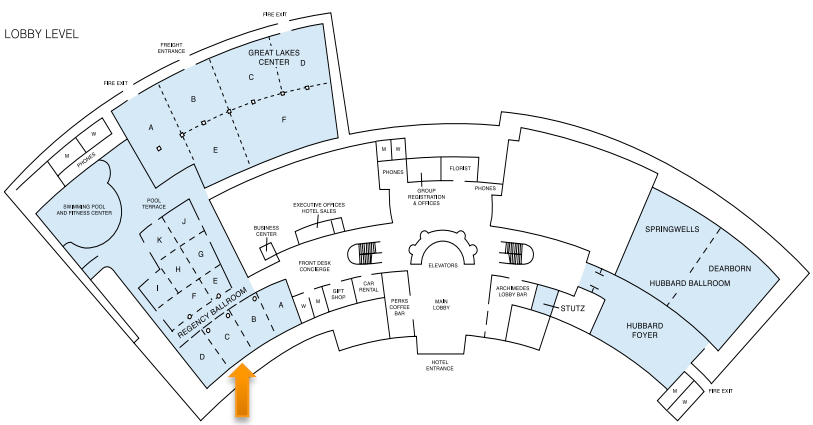
Panel Organizer: Berker Bilgin, Program Manager, McMaster Automotive Resource Center

Moderator: Larry Michaels, Principal Vehicle Systems Engineer, Energy Systems Division, Argonne National Laboratory

Panelists:

- Scott Stanton, Technical Director, Advanced Technology Initiatives, ANSYS, Inc.
- Sachin A. Bhide, Controls Engineer, Electrified Powertrain Architecture, FCA US LLC
- David Farnia, JMAG Technical Sales, Powersys-Solutions
- Ben Black, Market Development Manager, Real-time Test, National Instruments

Panel Summary: The development of Hybrid (HEV), Plug-in Hybrid (PHEV), and Battery Electric Vehicles (EV), their components and control systems require significant effort in terms of testing and validation. Hardware-in-the-Loop (HIL) platform provides cost-effective and rapid design capabilities for developing and prototyping electrified powertrains. However, building the models of the vehicle architectures, and powertrain components such as battery, electric motor, and power electronic converters with high accuracy is a challenge considering the real-time computational capabilities of the hardware. This panel will focus on identifying the requirements and the challenges in the development of Hardware-in-the-Loop modeling and simulation of HEV/PHEV/EV components and systems. The recent advancement on the HIL capabilities for electrified powertrain development will be also discussed.



Tuesday, June 16, 2015

Afternoon Breakout Sessions

Panel 8: Market Penetration of EV, HEV, PHEV and their Batteries

Tuesday, June 16, 2015
2:00 PM – 3:20 PM
Venue: Regency E-F

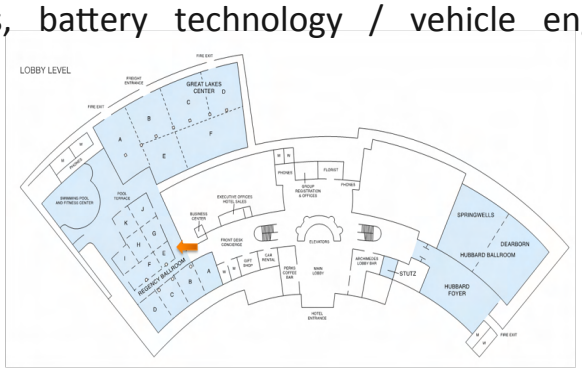
Panel Organizer: Max Zou, FCA US LLC and Haochi Li, FCA US LLC

Moderator: Haochi Li, FCA US LLC

Panelists:

- Wahid Nawabi, SVP & GM – Efficient Energy Systems, AeroVironment, Inc.
- Le-Yi Wang, Professor/IEEE Fellow, Department of Electrical and Computer Engineering, Wayne State University
- Dirk Spiers, Director, Spiers New Technologies Inc.
- Kent Snyder – Technical Expert, Research & Innovation Center, Ford Motor Company
- Brandy Goolsby, Manager, Propulsion Strategy, Electrification & Tools, FCA US LLC

Panel Summary: For the past two decades, petroleum consumption has been steadily increasing while domestic production continued to decline. The world oil production is predicted to peak in the next couple of decades; a dramatic fluctuation of gasoline price is being witnessed recently; fuel and vehicle emissions standards are getting more tightened than ever. All indicates that we are standing at a turning point in the automotive industry. The next generation automobiles should be designed based on a sustainable transportation model with considerably improved fuel efficiency and vehicle emissions, which eventually use renewable fuels as the primary energy source. Electric vehicles, such as EV, HEV and PHEV, have been vastly promoted as potential technologies to reduce petroleum consumption and greenhouse gas (GHG) emissions, as well as improving power grid management via vehicle-to-grid (V2G) services. The market volume of these technologies, however, has never reached an effective level so as to impact oil consumption and GHG emissions. Therefore, the primary focus of this panel will be in defining sustainable transportation models for EV, HEV, PHEV and their batteries to facilitate their market penetration. The panel will also discuss and analyze the positive and negative factors affecting market penetration, such as governmental regulations, battery technology / vehicle engineering challenges, and total cost of ownership.



Tuesday, June 16, 2015

Afternoon Breakout Sessions

Panel 9: Semiconductor Technology Development for Transportation Electrification

Tuesday, June 16, 2015
4:20 PM – 5:40 PM
Venue: Regency C-D

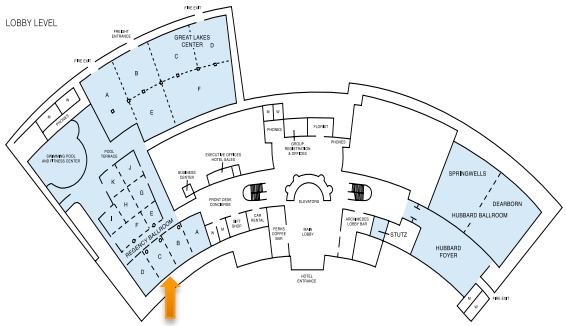
Panel Organizer: Omer C. Onar, Oak Ridge National Laboratory

Moderator: Madhu Chinthavali, Lead, Power Electronics Team, Power Electronics and Electric Machinery Group, Oak Ridge National Laboratory

Panelists:

- Jeffrey B. Casady, Business Development & Programs Manager, Cree
- John Berteux, National Strategic Account Manager, International Rectifier & Infineon
- Julian Styles, Director of Business Development North America, GaN Systems
- Toshiya Nakano, Director of Engineering, Mitsubishi Products & Engineering

Panel Summary: For automotive applications, there are many advantages of emerging semiconductor devices such as SiC or GaN including higher switching frequency, reduced losses, high temperature operation capability, and higher power density. With properties suitable for conducting electricity in extreme environments, they are ideal devices for applications that are subject to high voltages and temperatures, such as in electric vehicles.
On the other hand, cost, reliability, and maturity are still driving factors for conventional silicon based devices. While past problems with substrate defects are rapidly being addressed and companies are working to develop more robust switches, IGBT and MOSFET technologies are also progressing towards higher performance at lower costs. This panel will discuss the needs of automotive semiconductor technology development for transportation electrification industry in order to offer high-performance and low-cost power electronic interfaces. This panel will also address WBG development issues range from fundamental science to technology development and maturation strategies with a focus on materials research, device design, packaging, manufacturing processes, system design and development, and reliability.



Tuesday, June 16, 2015

Afternoon Breakout Sessions

Panel 10: Applications for Secondary Use of Automotive Batteries

Tuesday, June 16, 2015
4:20 PM – 5:40 PM
Venue: Regency E-F

Panel Organizer: Omer C. Onar, Oak Ridge National Laboratory

Moderator: Dirk Spiers, Director, Spiers New Technologies Inc.

Panelists:

- Ben Ollis, Oak Ridge National Laboratory
- Martin Weiss, NH Research
- Bryan Schultz, Spiers New Technologies Inc.
- Peter Karlson, Canadian Regional Engineering Centre-Energy Systems, General Motors

Panel Summary: Original equipment manufacturers (OEM) offer long-term warranties for the battery packs in their vehicles. The expectation is that once battery performance (energy storage capacity or peak power) decreases to 80%, the batteries will be replaced by the OEMs. The rationale is that a 20% reduction in the vehicle range, imposed by the decrease in performance, would be unacceptable to consumers. Based on various forecasts for market penetration of plug-in hybrid electric vehicles (PHEVs) and EVs over the next 10 years, it is estimated that a large number of PHEVs and EVs will be approaching the 80% battery performance level by 2020. These batteries can be recycled or used in other less demanding applications provided that a business case can be made for their secondary use. The objective of panel session is to explore the various possible markets for the secondary use of Li-ion batteries removed from electric or hybrid electric vehicles (EVs or HEVs) after they can no longer conform to vehicle specification but still have substantial functional life. The panel will give an overview of how these after vehicle batteries could be deployed in other applications. The major focus will be dedicated to the cost competitiveness of these batteries for power grid applications. The discussions will cover current barriers, technology developments that are critical achieving price & performance characteristics, effects of adding another lifecycle to the vehicular batteries (cost, recycling, and environmental effects), supporting & enhancing micro and smart grid development, and the demonstration projects.

Tuesday, June 16, 2015

Afternoon Breakout Sessions

Panel 11: Charging Technology, Logistics, and Infrastructure

Tuesday, June 16, 2015
4:20 PM – 5:40 PM
Venue: Regency G-H

Panel Organizer and Moderator: Vino Pathmanathan, FCA US LLC and Dan Luedtke, FCA US LLC

Panelists:

- Richard Scholer, Manager, Vehicle to Grid Interface, FCA US LLC
- Jason D. Harper, Principal Electrical Engineer, Electric Vehicle-Smart Grid Interoperability Center, Argonne National Laboratory
- Alexander Shoshiev, Principal Systems Engineer, EVSE Products, Yazaki North America
- Mike Bourton, Co-Founder & VP of Business Development, Software Components and Systems, Kitu Systems

Panel Summary: Electrification and complexity of hybrid, and electric vehicles from AC (L1/L2/L3)/ DC(L1/L2) charging is increasing rapidly with wide varieties of charging architecture within the vehicle, and simple/complex EVSE's. This panel will concentrate on the following topics:

- Definition of commonly used terms in AC/DC charging from vehicle/EVSE
- Charging standards: North American, Asian, and European
- Interoperability: Standards, and Goals for standard groups (i.e.: Increase interoperability between the vehicle, and EVSE in a safe manner). Commonly observed interoperability issues
- Vehicle Architecture
- Simple/Complex EVSE's
- Scheduled charging and Charging HMI: Vehicle, and EVSE
- Next steps in Charging.

Wednesday, June 17, 2015

Morning Breakout Sessions

Technical Session 5: Advances in Transportation **Session Chairs:** Dr. Pourya Shamsi, Missouri University of Science and Technology, USA Dr. Giorgio Sulligoi, University of Trieste, Italy	
8:30 AM – 10:10 AM *Venue: Regency A-B*	
TS5-1	**Geospatial modelling, train performance simulation and real-time operations using eTraX integrated traction power software solution (presentation-only)** Tanuj Khandelwal *ETAP, USA*
TS5-2	**Aircraft Electric Propulsion Systems Applied Research at NASA (presentation-only)** Sean Clarke, Yohan Lin, Kurt Kloesel, Aamod Samuel, and Kurt Papathais *NASA Armstrong Flight Research Center, USA*
TS5-3	**Vehicle Braking Strategies Based on Regenerative Braking Boundaries of Electric Machines** Aravind Samba Murthy[1], David Magee[2], and David Taylor[1] *[1]Georgia Institute of Technology, USA, [2]Texas Instruments, USA*
TS5-4	**Electric Waterborne Public Transportation in Venice: a Case Study** Mattia Morandin[1], Silverio Bolognani[1], Pierpaolo Campostrini[2], Antonio Ferrai [3], and Massimo Guarnieri[1] *[1]University of Padova, Italy, [2]CORILA Consortium – Venice, Italy, [3]ACTV Venice, Italy*
TS5-5	**Electric Hybridization of a Bow Thruster for River Boat Application** Jeff Moussodji and Alexandre De Bernardinis *IFSTTAR, France*

Technical Session 6: Conductive/Inductive Charging Technology **Session Chairs:** Dr. Lucia Gauchia, Michigan Technological University, USA Dr. Otto Kreutzer, Fraunhofer Institute, Germany	
8:30 am – 10:10 AM *Venue: Regency C-D*	
TS6-1	**Analysis of Ground Fault Currents in Isolated and Non-Isolated Charging Modules in Electric Vehicles** Ahmad Albanna, Md Nayeem Arafat, Atul Gupta, Mohammad Anwar, and Mehrdad Teimor *Global Electrification, General Motors, USA*
TS6-2	**Integrated Charger with Wireless Charging and Boost Function for PHEV and EV Applications** Madhu Chinthavali, Omer Onar, Steven Campbell and Leon M. Tolbert *Oak Ridge National Laboratory, USA*
TS6-3	**A New Design Methodology for a 300kW, Low Flux Density, Large Air-Gap, On-Line Wireless Power Transfer System** Seung-Hwan Lee, Byung-Song Lee, Jun-Ho Lee, Chan-Bae Park, Soo-Gil Lee, Shin-Myung Jung, Kyung-Pyo Yi, Jeihoon Baek, and Jae-Hee Kim *Korea Railroad Research Institute, Korea*
TS6-4	**Smart Management Systems of Plug-in Electric Vehicle Charging Services** Yi Guo, Shengyao Xu, and Wencong Su *University of Michigan-Dearborn, USA*
TS6-5	**A General Approach to Tuning of A Dual Secondary Winding Transformer for Inductive Power Transfer** Konrad Woronowicz, Alireza Safaee, and Tim Dickson *Bombardier Transportation, Canada*

Wednesday, June 17, 2015

Morning Breakout Sessions

Technical Session 7: Converter/Inverter Design and Control I **Session Chairs:** Dr. Rashmi Prasad, General Motors, USA Dr. Haoyu Wang, ShanghaiTech University, China	
8:30 AM – 10:10 AM *Venue: Regency E-F*	
TS7-1	**Simplified Control for Redistributive Balancing Systems using Bidirectional Flyback Converters** Lucas McCurlie[1], Matthias Preindl[1], Pawel Malysz[2], and Emadi Ali[1] *[1]MacAUTO, McMaster University, Canada, [2]Fiat Chrysler Automobiles, USA*
TS7-2	**Multilevel Modular Converter with Reduced Device Count for Hybrid and Electric Vehicle** Dong Cao, Xiaofeng Lyu, and Yanchao Li *North Dakota State University, USA*
TS7-3	**Current-Fed Inverter Topologies and Control Strategy applied to Modular Power Fuel Cells in Transportation Applications** Alexandre De Bernardinis *IFSTTAR, France*
TS7-4	**Repetitive Control-Based Current Ripple Reduction Method with a Multi-Port Power Converter for SRM Drive** Fan Yi and Wen Cai *The University of Texas at Dallas, USA*
TS7-5	**Comparative Study of Three-Phase Buck, Boost and Buck-Boost Rectifier Topologies for Regulated Transformer Rectifier Units** Ayan Mallik and Alireza Khaligh *University of Maryland, USA*

Technical Session 8: Power Electronics and Control **Session Chairs:** Dr. Serdar Yonak, Ford Motor Co., USA Dr. Dakshina Murthy-Bellur, Cummins Power Generation, USA	
8:30 AM – 10:10 AM *Venue: Regency G-H*	
TS8-1	**Stability analysis, discrete time modeling and active stabilization of DC-DC converter, taking into account the load dynamic** Louis-Marie Saublet, Roghayeh Gavagsaz-Ghoachani, Babak Nahid-Mobarakeh, Jean-Philippe Martin, and Serge Pierfederici *GREEN, University of Lorraine, France*
TS8-2	**A Fixed-Frequency Soft Switching Series Resonant Converter with Adaptive Auxiliary Circuit for Transportation Applications** Alireza Safaee[1], Behnam Koushki[2], Konrad Woronowicz[1], Praveen Jain[2], and Alireza Bakhshai[2] *[1]Bombardier Transportation, Canada, [2]Queen's University, Canada*
TS8-3	**Study of the Switching Performance and EMI Signature of SiC MOSFETs under the Influence of Parasitic Inductance in an Automotive DC-DC Converter** Di Han and Bulent Sarlioglu *University of Wisconsin-Madison, USA*
TS8-4	**Vehicle Control Unit for Drivetrains exclusively from Power Electronics Technology Demonstrators** Christian Sültrop *Friedrich-Alexander-University Erlangen, Germany*
TS8-5	**Integrated Active Power Filter Auxiliary Power Modules for Electrified Vehicle Applications with Single-Phase On-board Chargers** Ruoyu Hou and Ali Emadi *MacAUTO, McMaster University, Canada*

Wednesday, June 17, 2015

Morning Breakout Sessions

Technical Session 9: Converter/Inverter Design and Control II **Session Chairs:** Dr. Mohamed Youssef, University of Ontario-Institute of Technology, Canada Dr. Omer Onar, Oak Ridge National Laboratory, USA	
10:30 AM – 12:10 PM *Venue: Regency A-B*	
TS9-1	**High-Frequency Split-Phase Air-Cooled SiC Inverter for Vehicular Power Generators** Dakshina Murthy-Bellur, Elias Ayana, Sergey Kunin, and Brad Palmer *Cummins Power Generation, USA*
TS9-2	**Regenerative Braking Capability of Converter-Controlled Induction Machines** Aravind Samba Murthy[1], David Magee[2], and David Taylor[1] *[1]Georgia Institute of Technology, USA, [2]Texas Instruments, USA*
TS9-3	**System, Method, and Results for the Regenerative Burn-In Testing of High-Power DC-DC Converters** Grayson Zulauf, William Treichler, and James Castelez *Motiv Power Systems, USA*
TS9-4	**A New Isolated Multilevel Inverter Based on Cascaded Three-Phase Converter Blocks** Zuhair Alaas and Caisheng Wang *Wayne State University, USA*
TS9-5	**Study of Stability and Power Quality of Parallel Grid-Connected Inverters for Vehicle-to-Grid Application** Wooyoung Choi, Casey T. Morris, Di Han, and Bulent Sarlioglu *University of Wisconsin-Madison, USA*

Technical Session 10: Power Electronics for Vehicular Technologies **Session Chairs:** Dr. Pavol Bauer, Delft University of Technology, Netherlands Dr. Massimo Guarnieri, University of Padova, Italy	
10:30 AM – 12:10 PM *Venue: Regency C-D*	
TS10-1	**Microgrid Simulation and Management for Marine Applications (presentation-only)** Tanuj Khandelwal *ETAP, USA*
TS10-2	**REV-Cycle: A MATLAB-based Tool for Large-Data Analysis of Real-Life Driving Cycles for Electric Vehicles** Antonio Gauchia, Mehdi Jafari, Kuilin Zhang, and Lucia Gauchia *Michigan Technological University, USA*
TS10-3	**Dynamic analysis of an onboard DC distribution system with active stabilizer** Mehdi Karbalaye Zadeh[1], Roghayeh Gavagsaz-Ghoachani[2], Serge Pierfederici[2], Babak Nahid-Mobarakeh[2], and Marta Molinas[1] *[1]Norwegian University of Science and Technology, Norway, [2]GREEN,University of Lorraine, France*
TS10-4	**Towards Standardized Vehicle Grid Integration: Current Status, Challenges, and Next Steps** Bo Chen[1,2], Keith S. Hardy[1], Jason D. Harper[1], Theodore P. Bohn[1], and Daniel S. Dobrzynski[1] *[1]Argonne National Laboratory, USA, [2]Michigan Technological University, USA*
TS10-5	**Improved Method for MOSFET Voltage Rise-time and Fall-time Estimation in Inverter Switching Loss Calculation** Jing Guo, Hao Ge, Jin Ye, and Ali Emadi *MacAUTO, McMaster University, Canada*

Wednesday, June 17, 2015

Morning Breakout Sessions

Technical Session 11: Energy Storage and Management **Session Chairs:** Dr. Wencong Su, University of Michigan, Dearborn, USA Dr. Ryan Ahmed, FCA Canada Ltd, Canada	
10:30 AM – 12:10 PM *Venue: Regency E-F*	
TS11-1	**Energy Management for an 8000HP Hybrid Hydraulic Mining Shovel** Omar Abdel-Baqi[1], Peter Miller[1], and Adel Nasiri[2] *[2]Caterpillar Global Mining, USA, [2]University of Wisconsin–Milwaukee, USA*
TS11-2	**Pareto Frontier of Energy Storage Costs-Fuel Economies for a Series HEV Using Bandwidth Based Control Strategy** Masood Shahverdi, Michael Mazzola, and Quintin Grice *Mississippi State University, USA*
TS11-3	**Linear Programming Based Design and Analysis of Battery Pack Balancing Topologies** Ran Gu[1], Pawel Malysz[2], Matthias Preindl[1], Hong Yang[2], and Ali Emadi[1] *[1]MacAUTO, McMaster University, Canada, [2]Fiat Chrysler Automobiles, USA*
TS11-4	**Prediction of PEMFC Stack Aging Based on Relevance Vector Machine** Yiming Wu, Elena Breaz, Fei Gao, and Abdellatif Miraoui *Université de Technologie de Belfort-Montbeliard, France*
TS11-5	**Power Management Strategy of Hybrid Electric Vehicles Based on Particle Swarm Optimization** Changjian Hu, Yimin Gao, and Alex Q. Huang *North Carolina State University, USA*

Technical Session 12: Power Electronics **Session Chairs:** Dr. Xiaodong Shi, Mercedes-Benz R&D, USA Dr. Konrad Woronowicz, Bombardier Transportation, Canada	
10:30 AM – 12:10 PM *Venue: Regency G-H*	
TS12-1	**Comprehensive Performance Optimization for Electric Vehicles equipped with AMT based on Genetic Algorithm** Xiaofeng Yin[1], Volker Pickert[2], Xiaohua Wu[1], Hua Sun[1], and Wei Li[1] *[1]Xihua University, China, [2]Newcastle University, United Kingdom*
TS12-2	**Management of Harmonic Propagation in a Marine Vessel by use of Optimization** Espen Skjong[1], Miguel Ochoa-Gimenez[2], Marta Molinas[1], and Tor Arne Johansen[1] *[1]Norwegian University of Science and Technology, Norway, [2]Comillas Pontifical University, Spain*
TS12-3	**Average Model of a Three Phase Controlled Rectifier Valid for Continuous and Discontinuous Conduction Modes** Joseph Maurio, Thomas Roettger, and Matthew Superczynski *Northrop Grumman Corporation*
TS12-4	**A Novel Common Mode Multi-phase Half-wave Semi-synchronous Rectifier for Inductive Power Transfer Applications** Kerim Colak, Erdem Asa, Mariusz Bojarski, and Dariusz Czarkowski *New York University, USA*
TS12-5	**A simple, reliable, cost and volume saving DC-link discharge device for electric vehicles** Otto Kreutzer, Bernd Eckardt, and Martin Maerz *Fraunhofer IISB Erlangen, Germany*

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

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Key Dates

Deadline for submission of paper proposals (abstracts/digests):	November 13, 2015
Author's notification of acceptance:	February 5, 2016
Deadline for submission of final camera-ready manuscripts:	April 8, 2016
Deadline for early registration:	April 8, 2016

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:

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General Chair: Berker Bilgin, MacAUTO, McMaster University, Canada
Program Chair: Omer C. Onar, Oak Ridge National Laboratory, USA
Program Co-Chair: Xiaodong Shi, Mercedes Benz R&D, USA

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

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The conference booking website will help ITEC attendees 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:

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With breakfast: $134

With breakfast for two: $143

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CONFERENCE GENERAL CHAIR
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