

# IEEE VPPC 2023 CONFERENCE PROGRAM

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# THANK YOU PATRONS



**IEEE**



**Welcome from the VPPC 2023 General Chair**  
**Giambattista Gruosso, Politecnico di Milano, Italy**



On behalf of the Organizing Committee, it is my great pleasure to welcome you to the 2023 edition of the IEEE Vehicle Power and Propulsion Conference in Milan Italy.

We are thrilled to have the opportunity to reconnect with old colleagues and meet new researchers in the field of electric transportation at the upcoming VPP Conference. It's exciting to know that this is the first time the conference will be held in Italy, a country that has been a pioneer in transportation and now, also in electric transportation. As a pioneering forum dedicated to electric mobility, the VPP Conference is in a position to create and disseminate knowledge that will help our communities transition to sustainable transportation, improve air quality, and reduce greenhouse gas emissions.

Our goal for this conference is to maintain the high scientific level of previous events and provide a forum for researchers to discuss new ideas, forge new alliances, and inspire and support students. We believe that students will be responsible for designing transportation systems of the future, under the premises of maximum efficiency, safety, and sustainability. With these goals in mind, we are committed to working hard to ensure that all attendees have a pleasant and productive stay at IEEE VPPC 2023.

We couldn't have organized such an event without the support of the enthusiastic Local Committee, the international staff, the Technical Program Committee, and the VPP Standing Scientific Committee. Their combined experience will guarantee the highest organizational and scientific quality. We are excited to organize this flagship conference for advanced transportation and look forward to a productive and enjoyable event.

Warmest Regards,

A handwritten signature in black ink that reads "Giambattista Gruosso". The signature is written in a cursive, flowing style.

Giambattista Gruosso, Politecnico di Milano, Italy  
*General Chair, IEEE VPPC 2023*

## Message from the Technical Program Committee Chairs



**Clément Mayet**  
University of Lille,  
France

**Luigi Piegari**  
Politecnico di Milano,  
Italy

On behalf of the Technical Program Committee (TPC), it gives us great pleasure to welcome you to the 19th IEEE Vehicle Power and Propulsion Conference (IEEE VPPC 2023), which is being held in Italy for the first time. The event will take place both on-site and virtually, although virtual participation is minimal. The on-site conference is organized by the Politecnico di Milano and will be held partly on the university campus and partly at the NHOW hotel in the center of Milan.

The Committee has organized an impressive program that covers many exciting aspects about vehicle power and propulsion. They have been reunited under 8 Regular Tracks and 7 Special Sessions covering the topics related to latest developments in energy storage and generation systems, power electronics and motor drives, electric power systems, vehicular electronics, intelligent transportation systems, control, and energy management, charging systems and infrastructures, hydrogen systems, electric railways, etc. The technical program consists of 35 oral sessions and 1 virtual session. In total the conference Track Chairs have selected 176 papers for oral presentations and 25 papers for virtual presentations from a total of 249 submissions coming from 33 countries. All the accepted papers will be published in the conference proceeding (if presented during the conference) and benefit from the IEEE Xplore visibility. In addition, the conference includes “prestigious keynote talks, a technical exhibition, a social networking program, 2 tutorials on Tuesday, and technical visits on Friday afternoon. We assure you that the local organizing committee of IEEE VPPC 2023 is striving to offer an exciting and attractive stay in Milan.

We are grateful to the large number of volunteers who have worked hard at all levels, including those who participated in the review process, the Track Chairs involved in the paper selection (including Special Session and Tutorial Tracks), and the Invited Speakers. This conference would not be possible without their dedication and efforts.

Finally, and most importantly, we would like to thank you, the “*participants*”, for having decided to contribute and share your ideas and works to this conference and for making it a success.

We look forward to meeting you in person or virtually in Milan, Italy, from October 24<sup>th</sup> to October 27<sup>th</sup>.

TPC Chairs of IEEE VPPC 2023

**Clément Mayet**  
University of Lille,  
France

**Luigi Piegari**  
Politecnico di Milano,  
Italy

## Welcome from the Vehicular Technology Society President

**Weihua Zhuang, University of Waterloo, Canada**



On behalf of the IEEE Vehicular Technology Society (VTS), it is my great honor and pleasure to welcome you to the 2023 IEEE Vehicle Power and Propulsion (VPPC) in Milan, Italy!

This annual IEEE VTS conference brings together individuals from academia, industry, and government institutes to discuss and exchange ideas in the fields of electrified vehicle power, propulsion, and related technologies. Organizing this world-class conference requires a strong team of volunteers who have devoted both their time and their technical expertise. I want to take this opportunity to thank and congratulate the whole conference organization committee led by the VTS Vice President for Conferences, J.R. Cruz, the Conference General Chair Giambattista Gruosso, Technical Program Committee Co-Chairs Clement Mayet and Luigi Piegari. The conference organization committee has been working diligently in planning and running this conference with an excellent program, including the keynote papers by authoritative speakers, technical sessions, tutorials, posters, special and invited sessions, and exhibitions. We highly appreciate their great efforts. Furthermore, I would like to thank all the sponsors for their generous support that enriches the conference program and will enhance your experience at this conference.

IEEE VTS has been successful in engaging the global technical community and in contributing to advances in vehicular technology in the areas of mobile radio, motor vehicles, and land transportation. In recent years, it has been promoting R&D activities in vehicle power and propulsion systems, in autonomous, connected, and electric vehicles, and in intelligent ground transport infrastructures. Building on the momentum, the VTS strives to listen to our members for their needs, be creative and work hard on various existing programs and new initiatives towards a stronger Society. In particular, the VTS would like to further engage our members in technical activities via our technical committees. We have nine technical committees in our areas of interest, including Vehicular Power and Propulsion, Motor Vehicles, Autonomous Vehicles, and Electric Railways. Please visit the VTS website, to learn more about the technical committees, and to register to the committees of your interest. We encourage your participation and welcome your ideas and suggestions for the technical committees. If you are not a VTS member or student member yet, it is a good idea to consider joining VTS today to benefit from all the services and resources that VTS provides and to contribute to the community!

Finally, I would like to extend my sincere thanks to everyone for attending this conference and I wish all of you a great time at this VPPC!

A handwritten signature in black ink, appearing to read 'W Zhuang'.

Weihua Zhuang



Prof. Alain Bouscayrol,  
University of Lille, France

## Welcome from the chair of the VPPC steering committee

On behalf of the Vehicle Power Propulsion Conference (VPPC) steering committee, it is my great pleasure to welcome you to the 20th IEEE VPPC.

After a critical period due to the COVID-19 crisis, IEEE-VPPC comes back to a normal edition. IEEE-VPPC'22 in Merced (California) was a valuable intermediary hybrid and successful edition. All in-presence attendees enjoyed to meet each other and the lectures were very interactive that demonstrate the interest to attend physically a conference. The younger scientists who attended a conference for the first time were surprised about the quality of the exchanges. IEEE-VPPC'23 will be mainly in-presence and I hope we would continue such a positive dynamic!

Special thanks to Prof. Weihua Zhuang, VTS President, and Prof. J.R. Cruz, the VTS Conference Vice-President, for their strong supports. Warm thanks to Cerry Leffler and Rodney Clint Keele (VTS Program Administrators) for their huge work in this still difficult context. Kind thanks to Prof. Giambattista Gruosso (Politecnico Milano), VPPC'23 general chair, for his great effort to organize a high-level event. Many thanks to Clement Mayer (Le Cnam, France) and Luigi Piegari (Politecnico Milano, Italy), the Technical Program Committee co-chairs for their hard work to keep a high-level scientific program. **A key international conference needs a strong and dynamical international team** that can propose relevant adaptations in any context. We are lucky to have such a strong and dynamical team!

The next edition, IEEE-VPPC'24 will be a joint event with IEEE-VTC'24 Fall in Washington DC (USA) for the 100<sup>th</sup> anniversary of the VTS conference! It will be an interesting opportunity to strengthen the link of all scientific communities of IEEE-VTS. New proposals of venue have been received from different continents that demonstrate the strong interest in IEEE-VPPC. The steering committee will thus plan in advance the venue of the next editions.

I hope you will enjoy IEEE-VPPC'23, and I am looking forward to meeting you in-presence!

Prof. Alain Bouscayrol  
Chair of the VPPC steering committee

# Organizing Committee

## **VPPC 2023 General Chair**

Giambattista Gruosso, Politecnico Milano, Italy

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Clement Mayet, Conservatoire National des Arts et Métiers de Paris, France

Luigi Piegari, Politecnico di Milano, Italy

## **Special Sessions Co-chairs**

Ricardo De Castro, University of California, Merced, USA

Marie Cecile Pera, University Bourgogne Franche-Comté, France

Cesar Diaz Londono, Politecnico di Milano, Italy

## **Tutorials Co-chairs**

João Pedro Trovão, University of Sherbrooke, Canada

Ke Li, University of Nottingham, UK

Francesco Braghin, Politecnico di Milano, Italy

## **Industry and Research and Workshop Co-chairs**

Mario Porru, University of Cagliari, Italy

Michela Longo, Politecnico di Milano, Italy

## **Local Organizing Chair:**

Giancarlo Storti Gajani, Politecnico di Milano, Italy

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J.R. Cruz, The University of Oklahoma, USA

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Thanh Vo-Duy, Hanoi University of Science and Technology, Vietnam

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Marziyeh Hemmati, Politecnico di Milano, Italy

## **Publications Co-Chairs:**

Rodney Clint Keele, University of Oklahoma, USA

Danil Hissel, University Bourgogne Franche-Comté, France

## **Conference Administrators:**

Rodney Clint Keele, The University of Oklahoma, USA

Cerry Leffler, The University of Oklahoma, USA

## Technical Program Committee

### Technical Program Co-chairs

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Luigi Piegari, Politecnico di Milano, Italy

### Track Chairs

#### Track 1: Energy Storage and Generation, Components and Systems

Ali Sari, University of Lyon, France  
Ronan German, University of Lille, France  
Theodoros Kalogiannis, Vrije Universiteit Brussel, Belgium  
Bào-Huy Nguyen, Hanoi University of Science and Technology, Vietnam

#### Track 2: Power Electronics, Motor Drives and Electric Power Systems

Jorge Garcia, University of Oviedo, Spain  
Marina Mendes Perdigao, Polytech Institute of Coimbra, Portugal  
Alessandro Serpi, University of Cagliari, Italy  
Jian-Xin Shen, Zhejiang University, China

#### Track 3: Vehicular Electronics and Intelligent Transportation Systems

Sergio Saponara, University of Pisa, Italy  
Souso Kelouwani, University of Quebec at Trois-Rivières, Canada  
Valentin Ivanov, Technische University of Ilmenau, Germany  
Michele Vignati, Politecnico di Milano, Italy

#### Track 4: Control and Energy Management of Transportation Systems

Théo Hofman, Eindhoven University of Technology, Netherlands  
Bedatri Moulik, Amity Institute of Technology, India  
Ziyou Song, National University of Singapore, Singapore  
Rui Araujo, University of Porto, Portugal

#### Track 5: Modeling, Analysis and Simulation of Transportation

Rochdi Trigui, Gustave Eiffel University, France  
Sylvain Pagerit, Argonne National Labs, USA  
Namwook Kim, Hanyang University, South Korea  
Luis Silva, University of Rio Cuarto, Argentina

#### Track 6: Charging Systems and Infrastructures

Paulo Pereirinha, INESC Coimbra, Portugal  
Cedric De Cauwer, Vrije Universiteit Brussel, Belgium  
Stefano Arrigoni, Politecnico di Milano, Italy  
Paolo Guglielmi, Politecnico di Torino, Italy  
Giancarlo Storti Gajani, Politecnico di Milano, Italy  
Luigi Pio Di Noia, University of Naples Federico II, Italy



## Technical Program Committee—Continued

### **Track 7: Hydrogen Refueling Infrastructures and Fuel Cell Vehicles**

Loic Boulon, University of Quebec at Trois-Rivières, Canada

Nadia Yousfi-Steiner, University Bourgogne Franche-Comté, France

Javier Solano, European Institute for Energy Research (EIFER), Germany

Christoph Hametner, TU Wien, Austria

### **Track 8: Electric Railway**

Pablo Arboleya, University of Oviedo, Spain

Zhongbei Tian, University of Birmingham, UK

Zedong Zheng, Tsinghua University, China

Federica Foadelli, Politecnico di Milano, Italy

### **Recent Results Track**

Minh Cao Ta, University of Sherbrooke, Canada

Xiaoyan Huang, Zhejiang University, China

Giancarlo Storti Gajani, Politecnico di Milano, Italy

Luigi Pio Di Noia, University of Naples Federico II, Italy

## Special Sessions

### Special Session Chairs

Ricardo De Castro, University of California – Merced, USA  
Marie Cecile Pera, University Bourgogne Franche-Comté, France  
Cesar Diaz Londono, Politecnico di Milano, Italy

### Special Session #1: Electrical Machines and Electromagnetic Actuators Targeting Vehicle-to-Grid (V2G) Technology

Huynh Van Khang, Universitetet i Agder, Norway  
Sarbjit Paul, Korea Electrotechnology Research Institute (KERI), South Korea  
Trung Duong, ABB Corporate Research Center, Germany

### Special Session #2: Energy Harvesting for Electric Vehicular Transport Applications

Carmine Stefano Clemente, University of Sannio, Italy  
Vincenzo Paolo Loschiavo, University of Sannio, Italy

### Special Session #3: Performance Optimization of Fuel Cell Systems for Heavy-Duty Electric Transportation

Hanqing Wang, Tongji University, China  
Zhongliang Li, University of Franche-Comté, France  
Daniel Hissel, University of Franche-Comté, France

### Special Session #4: V2X Technologies and Smart Road Infrastructures for C-ITS Services

Monica Nicoli, Politecnico di Milano, Italy  
Mattia Brambilla, Politecnico di Milano, Italy  
Sandra Roger, Universitat de València, Spain  
Thomas Zemen, AIT Austrian Institute of Technology GmbH, Austria

### Special Session #5: EMR and Other Graphic Descriptions

Walter Lhomme, University of Lille, France  
Bedatri Moulík, Amity University, India

### Special Session #6: Fast Charging and Smart Management of Batteries for Electric Vehicles

Yang Li, Chalmers University of Technology, Sweden  
Changfu Zou, Chalmers University of Technology, Sweden  
Davide M. Raimondo, University of Pavia, Italy

### Special Session #7: Integration of the Flexibility Potential of Electric Vehicles into the Energy System

Gabriele Fambri, Politecnico di Torino and Department of Energy, Italy  
Fabia Miorelli, German Aerospace Center and the Institute for Networked Energy Systems, Department of Energy, Germany

### Special Session #8: Electromobility and the City: Social, Economic and Urban Impacts of Electric Vehicles and their Infrastructures

Julia Frotey, Institut National de la Recherche Scientifique, Canada  
Eric Hittinger, Rochester Institute of Technology, USA

### Special Session #9: IEEE VTS Motor Vehicles Challenge 2023: A Multi-physical Benchmark Problem for Next Generation Energy Management Algorithms

Jonathan Brembeck, German Aerospace Center (DLR), Germany  
Ricardo de Castro, UC Merced, USA  
Jakub Tobolář, German Aerospace Center (DLR), Germany

## VPPC Steering Committee

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Loïc BOULON – VPPC 2015 chair, Univ. Québec à Trois-Rivières, Canada

Minh Ta CAO – VPPP 2019 chair, Univ. Sherbrooke – Canada

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Ricardo DE CASTRO – VPPC 2022 chair, University of California, Merced – USA

Giambattista GRUOSSO – VPPC 2023 chair, Politecnico di Milano – Italy

Daniel HISSEL – VPPC 2017 chair, Univ. Bourgogne Franche Comté, MEGEVH – France

Paulo PEREIRINHA – VPPC 2014 chair – Polyt. of Coimbra, INESCC – Portugal

Jian-Xin SHEN – VPPC 2016 chair, Zhejiang University, Hangzhou – China

João P. TROVAO – VPPC 2018 chair, Univ. Sherbrooke – Canada

## VPP Technical Committee

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Co-chair: Prof. Minh C. Ta – University of Sherbrooke – Canada

Secretary : Prof. Samir Jemeï – Franche-Comte University – France

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Clement Mayet, CNAM, France

## VPP Technical Committee—Continued

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Thanh Vo-Duy, University of Hanoi, Vietnam

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Bedatri Moulik – Amity University – India

Valentin Ivanov -Technische Universität Ilmenau – Germany

Xiaoyan Huang – Zhejiang University – China

## Reviewers

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Giancarlo Storti Gajani	Politecnico di Milano
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Juan M. Rey	Universidad Industrial de Santander
Juan Sanchez-Gonzalez	Universitat Politecnica de Catalunya
Julia Frotey	Institut National de la Recherche Scientifique

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Julia Maria Engelbrecht	Technische Universität Dresden
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Jun-Woo Chin	Korea Automotive Technology Institute
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Kamil Burak Dermenci	Vrije Universiteit Brussel
Kangrui Jiang	University of Liverpool
Ke Li	University of Nottingham
Ke Lu	National University of Singapore
Kella Srinuprasad	IIT Hyderabad
Kemal Kaya	AVL Research & Engineering
Khanh-Linh Dang	Hanoi University of Science and Technology
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Lam Vu-Ngoc	Hanoi University of Science and Technology
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Manel Mizat	University of Laghouat
Manuel Pereira	Faculty of Engineering, University of Porto
Manuel Ruppert	KIT
Marco Postiglione	University of Napoli Federico II
Margot GAETANI-LISEO	Université Claude Bernard Lyon 1
Mariagrazia Tristano	Sheffield Hallam University
Marie Hébert	UQTR
Marino Coppola	Università di Napoli Federico II
Marwan HASSINI	Université Gustave Eiffel
Mathias Herget	University of Applied Sciences Fulda
Matteo Dalboni	University of Parma
Maximiliano Asensio	National University of Río Cuarto
Md Sazzad Hosen	Vrije Universiteit Brussel
Meiling YUE	Beijing Jiaotong University
Miao DONGMIN	Schaeffler Trading
Michel Noussan	Politecnico di Torino
Michele Bonnin	Politecnico di Torino
Mi-Ching Tsai	National Cheng Kung University
Mihael Cipek	University of Zagreb



## Reviewers-Continued

Mohamed BEN-MARZOUK	Université Lyon 1
Nadia Steiner	University of Bourgogne Franche-Comté
Namdoo Kim	Argonne National Laboratory
Namwook kim	Hanyang University
Nan Chen	Tennessee Tech University
Nayara de Freitas	INESC TEC
Ngac Ky NGUYEN	ENSAM
Nguyen Thi Phuong Chi	University of Sherbrooke, Quebec, Canada
Niklas Wulff	German Aerospace Center
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Ning Yang	University of Liverpool
Nutthaka Chinomi	University of Liverpool
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Paolo	Marocco
Paolo Guglielmi	Poitecnico di Torino
Pascal Messier	Université de Sherbrooke
Pasquale de Falco	Università di Napoli Parthenope
Pasquale franzese	Università di Napoli Federico II
Paul Sarbajit	ABB Corporate Research Center
Paulo G. Pereirinha	IPC-ISEC, Polytechnic Institute of Coimbra
Pavlo Ivanchenko	Vrije Universiteit Brussel
Phil Sharer	Argonne National Laboratory
Philippe Delarue	University of Lille - LEP
Qicong Su	Beijing Institute of Technology
Qiu hao Hu	University of Michigan
Quang Bui Dang	HUST Vietnam
Qun Wang	Nanjing University of Science and Technology
Rabee Jibrin	University of Birmingham
Rafael Souza Baquero	Politecnico di Milano
Ram Vijayagopal	Argonne National Laboratory
Rand AL Mdanat	University of Oviedo
Ranjit Desai	NREL
Rekabra Youssef	Vrije Universiteit Brussel
Riadh Abdelhedi	University of Lyon, Ampère Lab
Ricardo de Castro	University of California, Merced
Rick Voßwinkel	Westfälische Hochschule Zwickau
Rinki Gupta	Amity University Uttar Pradesh
Roberto Re	Politecnico di Torino
Rochdi Trigui	IFSTTAR-UGE
Rodney Clint Keele	IEEE VTS / The University of Oklahoma
Ronan German	University of Lille
Ruchen Huang	Beijing Institute of Technology
Rui Esteves Araujo	University of Porto, Faculty of Engineering
Rusber Rodriguez	UTBM, France
Ryan O. Berriel	L2ep, University of Lille
Salma Fadili	University of Lille

Salvador Carvalhosa	INESC TEC
Samir Jemei	University of Franche Comte
Sandra Roger	University of Valencia
Sarah Saaed	University of Oviedo
Sarbajit Paul	ABB Corporate Research Center, Germany
Sarbajit Paul	Korea Electrotechnology Research Institute
Selim Solmaz	Virtual Vehicle Research GmbH
Serge PELISSIER	Universite Gustave EIFFEL
Sergio Cruz	University of Coimbra
Sergio Saponara	University of Pisa
Shuai Wang	Beijing Jiaotong University
Shun Cai	Dyson Technology LTD
Shushu Zhu	Nanjing University of Aeronautics and Astronautics
Silvio Vaschetto	Politecnico di Torino
Simone Barcellona	Politecnico di Milano
Sousso Kelouwani	University du Québec à Trois-Rivières
Stefano Arrigoni	Politecnico di Milano
Stephan Frei	TU Dortmund University
Subhendu Bikash Santra	KIIT University
Sun Jinlei	Nanjing University of Science and Technology
Sunil Chowdhary	Amity University Uttar Pradesh, Noida
Swaraj Banerjee	National Institute of Technology Nagaland
Sylvain Pagerit	Argonne National Laboratory
Tae Woo Lee	Electric Machines and Power Electronics Research Team
Tayfun Gundogdu	The University of Sheffield
Tedjani Mesbahi	INSA Strasbourg / ICube laboratory
Thanh Anh Huynh	National Cheng Kung University
Thanh Vo-Duy	Hanoi University of Science and Technology
Theodoros Kalogiannis	Vrije Universiteit Brussel
Thomas Geury	Vrije Universiteit Brussel
Thomas Zemen	AIT Austrian Institute of Technology
Tiago Oliveira	Instituto de Telecom.; Polytechnic Inst. of Coimbra ISEC
Tianhong Tan	Harbin Engineering University
Tien Nguyen-Minh	Hanoi University of Science and Technology, Vietnam
Tilman Bunte	DLR
TORKI Jami	Université Claude Bernard Lyon 1
V. K. Tayal	Amity University
V. P. Meena	Malaviya National Institute of Technology Jaipur
Valentin Ivanov	Technische Universität Ilmenau
Victor D. N. Santos	IPC-ISEC, Polytechnic Institute of Coimbra
Viktor Skrickij	VilniusTech
Vincenzo Paolo Loschiavo	University of Sannio
Vu-Khanh Tran	University of Science and Technology
Walter Lhomme	University of Lille
Wan Huang	Harbin Inst. of Tech. / Chongqing Research Inst. of HIT
Wang Tao	Nanjing University of Aeronautics and Astronautics

Wei Sun	CRRC Qingdao Sifang Rolling Stock Research Institute
Weizhong Fei	Yasa Motor
wenju yan	China University of Mining and Technology
Wheeler William	Université Claude Bernard Lyon 1, Ampère Lab
Woong Lee	Hyundai Motor Company
Xiangguo Liu	Northwestern University
Xiao Liu	University of Liverpool
Xiaoyan Huang	Zhejiang University
Xingwang Tang	Tongji University
Yan Li	Beijing Jiaotong University
Yan Wang	Nanyang Technological University
Yang Li	Chalmers University of Technology
Yang ZHOU	Northwestern Polytechnical University
Yiming Shen	Zhejiang University
Yinyu Chen	Southwest Jiaotong University
Yongjun Yan	The Chinese University of Hong Kong
Yu Quan	Hangzhou Dianzi University
Yu Wang	Huawei Digital Power Ltd
Yuanying Wang	University of Michigan
Yue Wu	Central South University
yue zhang	Shandong University
Yunchong Wang	Hongkong PolyU
Zahid Ullah	Politecnico di Milano
Zeineb Touati	Ecole Nationale d'Ingénieurs de Sousse
Zhan Xu	University of Birmingham
Zhang Peng Du	Technische Universität Wien
Zhenyu Zhao	Temple University
Zhiguang HUA	Northwestern Polytechnical University

## Keynote



### **Sergio Savaresi, Professor, Politecnico di Milano**

**Title:** Autonomous driving technology: the enabler for massive electrification of the personal mobility

**Abstract:** In the next 30 years a revolution is expected in the mobility model: the traditional personal mobility model (based on big, fossil-fuel-powered, personal-ownership cars) will be almost entirely replaced by Mobility-As-A-Service, autonomous, electric/H2 cars. This “revolution” aims to make a quantum leap in the overall efficiency of the mobility system, and to contribute to the improvement of the safety and sustainability of vehicles. This revolution will also deeply affect the structure of the entire automotive industry (layers, players, etc.)

Among the main technology megatrends, the autonomous-driving technology has a special/key role: not only is (by far) the most challenging from a technical point of view, but it will play the role of booster/catalyzer of all the other megatrends.

The plenary speech aims to provide a high-level view of this technology revolution, highlighting the role and the impact of the autonomous-driving technology.

**Bio:** Sergio M. Savaresi received the M.Sc. in Electrical Engineering (Politecnico di Milano, 1992), the Ph.D. in Systems and Control Engineering (Politecnico di Milano, 1996), and the M.Sc. in Applied Mathematics (Catholic University, Brescia, 2000). After the Ph.D. he worked as management consultant at McKinsey&Co, Milan Office. He is Full Professor in Automatic Control at Politecnico di Milano since 2006 . He is Deputy Director and Chair of the Systems&Control Section of Department of Electronics, Computer Sciences and Bioengineering (DEIB), Politecnico di Milano. He is author of more than 500 scientific publications. His main interests are in the areas of vehicles control, machine learning, and control applications, with special focus on smart mobility. He has been manager and technical leader of more than 400 research projects in cooperation with leading companies in the automotive industry. He is co-founder of 10 high-tech startup companies. He is the team leader of PoliMOVE, the winner of the the Autonomous Challenge @ CES 2022 (first ever high-speed fully-autonomous head-to-head multi-agent race).

## Keynote



**Stefano Erba**, Chief Strategy Officer of FNM S.p.A.

**Title:** H2iseO Hydrogen Valley for sustainable mobility

**Abstract:** The "H2iseO Hydrogen Valley for sustainable mobility" is an iconic project, implemented by FNM and other companies part of FNM Group (Ferrovienord, Trenord, Milano Serravalle-Milano Tangenziali, FNM Power, FNM Autoservizi) aiming at decarbonising public and private transport, supporting the transition towards a more sustainable transport system; it also enables the implementation in the area of infrastructure for hydrogen production and distribution, to support the local economic and industrial sector in pursuing the EU targets for energy transition.

It is based on two pillars:

- the full decarbonisation of public transport services operated by FNM Group in the Valcamonica area (in Lombardia near Milano, one of the UNESCO heritage sites in Italy), with the introduction of 14 hydrogen-powered trains and 40 hydrogen-powered buses, with 3 dedicated new hydrogen refuelling stations (HRSs) and 3 dedicated new hydrogen production plants;
- the creation of a network of 5 HRS (now sized for a capacity of distribution of 1 ton per day per station at 350 bar, 350 bar high flow and 700 bars, with possible scale-up) along the motorways operated by FNM Group (180km including the Milano ring roads and the A7 motorway Milano-Genova, both part of the TEN-T core network on the Mediterranean and Rhine-Alps Corridors), potentially connected to new dedicated hydrogen production plants and power stations for the production of additional green energy.

**Bio:** Chief Strategy Officer of FNM S.p.A. and project leader of hydrogen projects of the FNM Group MBA, PhD, 20+ years of international experience as manager for transport companies and as strategy, management and transport consultant for top tier transport companies. Member of the board of directors of several transport companies. Strong understanding of transport industry and of its functioning across different modes (rail, bus, road, aviation, maritime, logistics).

## Keynote Panel

### Women In Vehicular Technology

**Chairwomen: Marzyeh Hemmati, Carmela Cozzo**

**Speakers:**

**Weihua Zhuang** - IEEE VTS President - An overview of the VTS society

**Fabia Miorelli** - German Aerospace Center (DLR) - Forbes top 100 Talent under 30

**Francesca Roncolini** - Politecnico di milano

**Bios:**

**Marziyeh Hemmati** received her Bachelor degree in Electronics Engineering from IAUCTB, Iran, in 2016, and her Masters degree in Electrical Engineering from Politecnico Di Milano, Italy, in 2021.

Currently, she is working with Politecnico di Milano as a research fellow at the Simlab40 Her research interests include real-time simulation of electric systems, digital twins, Hardware-In-the-Loop simulation, and cyber-security of smart grids and electrical vehicles.

**Carmela Cozzo** is a Senior Member of IEEE, served as editor of the IEEE Transaction on Vehicular Technologies and as reviewer of major IEEE journals and conferences. She is the IEEE VTS Liaison to Women in Engineering Committee, and Chair of the IEEE VTS Committee on Women in VTS and Diversity. She holds several patents, has authored several IEEE papers and contributed to workshops/panels in wireless communications.



**Weihua Zhuang**

Dr. Weihua Zhuang is a University Professor and a Tier I Canada Research Chair in Wireless Communication Networks at University of Waterloo, Canada. Her research focuses on network architecture, algorithms and protocols, and service provisioning in future communication systems. She is the recipient of 2021 Women's Distinguished Career Award from IEEE Vehicular Technology Society, 2021 Technical Contribution Award in Cognitive Networks from IEEE Communications Society, 2021 R.A. Fessenden Award from IEEE Canada, and 2021 Award of Merit from the Federation of Chinese Canadian Professionals in Ontario. She was the Editor-in-Chief of the IEEE Transactions on Vehicular Technology from 2007 to 2013, General Co-Chair of 2021 IEEE/CIC International Conference on Communications in China (ICCC), Technical Program Chair/Co-Chair of 2017/2016 IEEE VTC Fall, Technical Program Symposia Chair of 2011 IEEE Globecom, and an IEEE Communications Society Distinguished Lecturer from 2008 to 2011. She is the President and an elected member of the Board of Governors of the IEEE Vehicular Technology Society. Dr. Zhuang is a Fellow of the IEEE, Royal Society of Canada, Canadian Academy of Engineering, and Engineering Institute of Canada.

## Keynote Panel—Continued

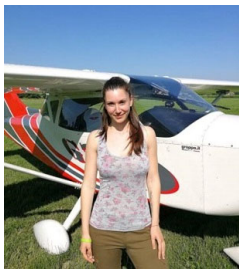


**Fabia Miorelli**

**Bio:** Fabia Miorelli is a researcher and Ph.D. candidate at the Institute of Networked Energy Systems at the German Aerospace Center (DLR). Her research focuses on the assessment of the impact of different vehicle and mobility concepts on future energy systems.

Before joining the German Aerospace Center, Fabia worked for one year at the International Renewable Energy Agency (IRENA) in the Sustainable Urban Energy Programme, supporting programmatic and strategic work for municipal and regional governments to integrate renewable energies at urban scale.

Fabia holds a B.Sc. in mechanical engineering from the Free University of Bolzano, Italy and a double degree M.Sc. in sustainable energy systems from KTH Royal Institute of Technology, Sweden and Instituto Superior Técnico, Portugal. She was listed on Forbes 30 under 30 and awarded the Young Italy Prize.



**Francesca Roncolini**

**Bio:** Francesca Roncolini graduated in Aeronautical Engineering at Politecnico di Milano. She carried out an internship at the swiss company UMS Skeldar, where she worked on the implementation of a mathematical nonlinear model for unmanned helicopters. Later, she worked as a consultant for the Flight Control System team in Leonardo Helicopters. Currently, she is a PhD student in Aerospace

Engineering at Politecnico di Milano.

## Keynote



### **Mario Aimo-Boot**

Electrification Technologies - Specialty e-Mobility and Innovation Manager

#### **Title: Heavy Duty Vehicle Electrification: the vision of Iveco Group**

**Abstract:** The electrification of heavy-duty vehicles (HDVs) is rapidly increasing to give a valuable contribution in decarbonization of the transportation sector. The global enactment of Regulations to limit CO2 emissions from new heavy-duty commercial vehicles in particular poses major challenges for any OEMs market strategies.

On these assumptions, the vehicle development requires a holistic approach and future trucks will be battery-electric or powered by a fuel cell depending on the vehicle's area of application and the distance to be covered, this leads to new tasks in addition to the classic areas of complete vehicle development.

In case of battery-electric trucks both the performance and the range requirements enforce the development of scalable modular battery system that enables the integration on chassis derived from the conventional Diesel propulsion.

The different architectures offer the integration of various electric drive solutions. Depending on the vehicle and customer requirements as well, either centrally arranged drive units combined with conventional axles, or axles with an integrated electric motor and transmission are implemented. Another ambitious task to address is the e-mobility of HDV fleets, including the interaction with the recharging infrastructure and the advanced services (e.g., smart charging and V2G, Vehicle-to-Grid). heavy commercial vehicles.

In sum, the keynote aims to give a comprehensive overview on the electrification status and trend on the heavy-duty vehicles and a vision on the relative transport sector scenario.

#### **Bio:**

**Mario Aimo-Boot** graduated with a degree in Electrical Engineering at Politecnico di Torino in 2002. After graduation, he worked at Centro Ricerche FIAT (CRF) in Electric & Electronic Architectures Department. In 2006 Mario was employed by IVECO S.p.A. as Innovation Specialist in the field of industrial vehicle technologies with main focus on Alternative tractions, E/E architectures and Preventive Safety. From 2008 to 2011 he worked as Project Manager for Hybrid Applications in the Medium & Heavy Commercial Vehicle Platform. In January 2012 he was appointed as Alternative Traction & Electrification Manager within the Product Development of Iveco. In 2019 he was designated as Technical Coordinator Manager in the Electrification Technology Department in CNH Industrial for the whole electrification applications.

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## Keynote—Continued

From October 2021 to September 2022, Mario has led the Simulation & Controls Team in the Electrification Team in the Iveco Group covering also the virtual and physical testing for all the electrification perimeters and cross projects. In this role, he is leading the Specialty e-Mobility and Innovation Team in the Iveco Group with the goal to extend the electrification in the special vehicle application and promote the innovation vision & mission in the electrification field. In addition to his primary appointment, since 2015, he has been charged as Tertiary Safety Leader to cover all the post-crash requirements and implementations in many CNH Industrial and Iveco Group products. Additionally, he is the Company Coordinator of the 2<sup>nd</sup> level Master's degree in apprenticeship in "Digitalization and Autonomous Commercial Vehicles for Carbon-Free Logistics" (2<sup>nd</sup> edition) designed in partnership between Iveco Group and Politecnico di Torino.

## Keynote



### **Gianmarco Montanari – Director General, MOST Foundation**

#### **Bio:**

**Gianmarco Montanari** is General Director of MOST Foundation in Milan. Most, The National Center for Sustainable Mobility, is an Applied Research Foundation with a clear mission to accompany the green and digital transition in a sustainable perspective, guaranteeing the industrial transition and accompanying companies and institutions towards modern, sustainable and inclusive solutions in the cities and regions of the country. The Group of Founders and Investors in MOST has a Total Turnover of more than 290 billions Euros and 580 thousands employees. Previously, he was General Director of the Italian Institute of Technology in Genoa after working for twenty years as a Top Manager in the Automotive, Financial Services, Management Consulting and Central Public Administration sectors, always managing processes of reorganization and digital transformation of complex companies with modern organization. He received a degree in Management Engineering from the Politecnico of Turin followed by four other degrees in Management, Economics, Political Science and Law and is formally certified as a F.I.G.C. Sports Management Collaborator, ACOI Coach and OIV Band 3 by the Ministry of Public Administration.

Over the years, he has achieved numerous specializations at the main International Business Schools (i.e. Harvard Business School, IMD, INSEAD, Columbia University, Bocconi) on management, innovation, digitization, high-tech and governance including.

He has been in a member of numerous boards of private and public companies including the Turin Transport Group, Agenzia delle Entrate in Italy and AGID (Digital Italian Agency), Fineco, Italgas, etc..

He was honoured first as “Cavaliere” of the Italian Republic and then as an “Ufficiale al Merito” of the Italian Republic.

He is the author of the book “Tech Impact. Luci ed ombre dello sviluppo tecnologico” (“Tech Impact. The Lights and Shadows of Technological Development”) and many other publications, as well as being an authoritative speaker on innovation, technology and change management. He is the inventor of IED® Intergenerational Environmental Debt.

## Keynotes



**Michele Bolpagni , Aqua super tech**  
**Filippo Brignone, Vita Power**

**Title:** New Trend in boat Electrifications

**Bios:**

**Michele Bolpagni:** Michele Bolpagni graduated with a degree in Mechanical Engineering from Politecnico di Milano and has spent his subsequent career in the e-Mobility field.

After beginning his career with Bosch as a Design Engineer, he held the role of Project Manager at Gewiss S.p.a., focusing on the development of AC charging systems for public and domestic applications. Most recently he has served as Product & Project Manager at Friem S.p.A., developing AC and DC charging stations for wheeled electric vehicles and electric boats, as well as depot DC charging infrastructure for e-buses.

He joined Aqua SuperPower in 2021 as Product Manager and Country Manager Italy and he is in charge of developing the business in Italy, South of France and Central Europe. He is also involved on the installation side, working together with the Deployment department.

**Filippo Brignone:** Filippo Brignone graduated with a degree in Information Management for Business from University College London and has later worked in consulting, e-commerce and a startup in the nautical sector.

After nearly 3 years spent working for KPMG in IT Advisory, Filippo became Brand Manager for Amazon working in the Books division and supporting some of Italy's main publishers utilizing the Amazon marketplace.

He later joined Vita Power in mid-2022 as Sales Director for Europe and is in charge of managing sales within the EU. This involves finding a wide range of clients and partners in areas such as south of France, Spain, Portugal & Italy in particular. Not only for the private sector but especially for the public sector due to Vita's range of commercial workboats and powertrains. He is also involved in the testing of new products & features feeding back any personal or customer information to continuously improve products.

# Tutorials

## Tutorial 1

### T1: Connected and Autonomous Electric Vehicle: From Modelling to Energy Efficiency Optimization

**Co-organizer:** Souso Kelouwani, Université du Québec à Trois-Rivières (UQTR), Canada

**Co-organizer:** Marie Hébert, Université du Québec à Trois-Rivières (UQTR), Canada

**Abstract:** Powertrain electrification is one of the promising ways to reduce greenhouse emissions from fossil fuels. Also, the development of autonomous driving systems for vehicles is gaining a lot of interest in the scientific community. The convergence of electric powertrain and autonomous driving will open new opportunities to improve significantly the energy efficiency of the vehicle (battery vehicle) whilst decreasing road accidents. However, these two topics (powertrain electrification and autonomous driving) are still discussed separately. To accelerate their convergence, a unified modelling and system optimization need to be carried out.

Nowadays and without autonomous driving, some significant progress has been done in order to optimize the use of onboard electric energy for short trips (i.e. commuting trips). However, the global energy efficiency and the battery lifespan preservation need more investigations over a long trip (i.e. the trip length exceeds the available vehicle autonomy). Indeed, the overall trip duration is extended with the battery charging time, and obviously, letting the battery to be depleted heavily (high values of depth-of-discharge) before stopping for charging can help to reduce this trip duration. But the battery lifespan is negatively affected by these depth-of-discharges. Stopping often in order to charge the battery and prevent a high depth-of-discharge will potentially increase the overall trip duration. Therefore, a trade-off must be found between preserving the battery lifespan and keeping reasonable the trip duration whilst improving globally the efficiency.

This technical tutorial will start by introducing some well-known models for autonomous driving and an electric vehicle (battery vehicle). Then, using the convex optimization framework, we will discuss a method to use autonomous driving capability to increase energy efficiency, for urban and highway driving conditions (with and without traffic).

#### Co-organizer bios:



#### Souso Kelouwani:

Holder of the Canada Research Chair in Energy Optimization of Intelligent Transport Systems and Holder of the Noovelia Research Chair in Intelligent Navigation of Autonomous Industrial Vehicles, Souso Kelouwani received his Ph.D. in robotics systems from Ecole Polytechnique de Montreal in 2011 and completed a postdoctoral internship on fuel cell hybrid electric vehicles at the Université du Québec à Trois-

Rivières (UQTR) in 2012. He developed expertise in the optimization and the intelligent control of vehicular applications. In 2019, his team received the 1st Innovation Prize in partnership with DIVEL, awarded by the Association des Manufacturiers de la Mauricie et Center-du-Québec for the development of an autonomous and natural navigation system. In 2017, he received the Environment Prize at the Gala des Grands

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## Tutorial 1—Continued

natural navigation system. In 2017, he received the Environment Prize at the Gala des Grands Prix d'excellence en transport from the Association québécoise du Transport (AQTr) for the development of hydrogen range extenders for electric vehicles.

Full Professor of Mechatronics in the Department of Mechanical Engineering since 2017 and a member of the Hydrogen Research Institute, he holds 4 patents in the United States and Canada, in addition to having published more than 100 scientific articles. Prof. Kelouwani was co-president of the technical committees of the IEEE International Conferences on Vehicular Power and Propulsion in Chicago (USA, 2018) and in Hanoi (Vietnam, 2019). His research interests focus on optimizing energy systems for vehicle applications, advanced driver assistance techniques, and intelligent vehicle navigation taking into account winter climatic conditions. Winner of the Canada General Governor Gold Medal in 2003, he is a member of the Order of Engineers of Quebec.



### **Marie Hébert:**

Assistant professor at the Université du Québec at Trois-Rivières (UQTR) in the Department of mechanical engineering, Marie Hébert received her Ph.D. in Mechanical and Mechatronics engineering from the University of Waterloo in 2020. She developed her expertise in mechatronics and fluid dynamics.

As a member of the Hydrogen Research Institute, she is actively involved in projects for the electrification of various vehicles with fuel cell systems. Her research interests include multiphysics systems, modelling, fuel cell systems, fluid dynamics, control, optimization of fluid supply, and microfluidics. She was awarded the Mechanical engineering medal in 2016 from Concordia University. She has also been the recipient of several scholarships such as the Nanofellowship from the Waterloo Institute for Nanotechnology, and the Canada Graduate Scholarships – Doctoral (CGS D) from the Natural Sciences and Engineering Research Council of Canada (NSERC).

## Tutorials—Continued

### Tutorial 2

#### T2: Strategies for Electric Vehicle Charging Management: A Comprehensive Demand Response Approach

**Co-organizer:** Cesar Diaz-Londono, Politecnico di Milano, Italy

**Co-organizer:** José Vuelvas, Pontificia Universidad Javeriana, Colombia

**Abstract:** The rapid growth in Electric Vehicle (EV) adoption presents challenges for integrating EV charging infrastructure with the electrical grid, as uncoordinated charging can jeopardize grid stability. Smart charging strategies are crucial to manage EV charging demand and ensure seamless integration. This tutorial delves into different strategies for managing the charging of EVs and their integration into the electrical grid. Two main Demand Response (DR) approaches are highlighted: a DR program for EVs as an indirect management mechanism, and Model Predictive Control (MPC) as a direct control strategy.

The tutorial initiates with an overview of DR and flexibility services within EVs, highlighting the significance of effective charging management while harnessing their energy storage capabilities. Subsequently, a DR program for EVs is introduced, which governs the charging decision process within a fleet. A time-of-use pricing strategy is employed to influence consumer charging decisions, employing a game theory-based model to capture interactions between the electric vehicle fleet operator and vehicle owners. The pricing-based approach is demonstrated to enhance fleet operator benefits and induce a shift in the fleet's charging profile.

In contrast to the previous strategy that encourages EV owners to alter their charging times, this tutorial further explores direct control strategies that schedule the dispatched charging power. Employing the MPC technique, this control method computes optimal charging sequences at each time interval, leveraging a receding horizon strategy. The effectiveness of the MPC strategy is demonstrated in scenarios such as tracking day-ahead scheduling, fulfilling dynamic energy service requirements, or reducing operation costs. Additionally, the strategy accommodates uncertainties such as variations in EV arrival state of charge and potential generation disturbances.

#### Organizer's Bios:



#### Cesar Diaz-Londono

**Bio:** Cesar Diaz-Londono is an Assistant Professor at Politecnico di Milano within the Dipartimento di Elettronica Informazione e Bioingegneria. He received the B.Sc. and M.Sc. degrees in electronics engineering from Pontificia Universidad Javeriana in 2014 and 2016, respectively. He holds a double doctoral degree, receiving a Ph.D. in engineering from Javeriana and a Ph.D. in electrical, electronics and communications engineering from Politecnico di

Torino in 2020. Cesar graduated with Cum Laude honors for his master's degree, and his doctoral thesis was awarded with the highest honors. Cesar possesses a wealth of experience in Research and Development projects, both funded by the Colombian government and the European Union. His involvement spans diverse areas, including the modeling and control of flexible loads,

*Continued on next page*

## Tutorial 2—Continued

the development of model predictive controllers for energy balancing services, and the implementation of distribution networks in Real-Time simulators. His research interests encompass a broad spectrum, focusing on smart grids, demand response, the integration of electric vehicles into the electrical grid, optimal control techniques, and optimization strategies.

### José Vuelvas



**Bio:** José Vuelvas is an Assistant Professor in the Department of Electronics at the Faculty of Engineering and holds the position of director of the master's Program in Energy and Sustainability at Pontificia Universidad Javeriana. With a background in electronic engineering, José earned his bachelor's degree in 2009, followed by a master's in electronic engineering in 2010, and completed his Ph.D. in engineering in 2019, all at Pontificia Universidad Javeriana. His academic focus encompassed electronic circuit design, control systems, optimization, game theory, and electric markets. Boasting over a decade of experience in the realm of higher education, José has made a significant impact as a university professor. In addition, he was a co-founder of Hakken, a tech firm that specialized in tailored solutions for renewable energies, lighting, and building automation. He received an Honorable Mention for his undergraduate thesis, followed by distinctions of Honors and Summa Cum Laude for his master's work. His doctoral thesis was awarded with highest honors. Presently, José also holds the role of Chair for the Colombian chapter of the IEEE Automatic Control Society.

## Technical Tours

### Politecnico di Milano - Drive Simulator, Wind Tunnel, Train Simulator

At the [Politecnico di Milano](#), an innovative cable-driven DiM400 DYNAMIC Driving Simulator by [VI-grade](#) has been adopted in February 2021. The Driving Simulator has been installed at the Bovisa site of the [Politecnico di Milano](#) (Technical University of Milan) and will be mainly used for performance studies of vehicles and subsystems related to new Material & Component Design, Ride & Handling, Real Driving Emission Applications, Active Safety Systems (ADAS), Automated and Connected Vehicles.

“Our adoption of a DYNAMIC Driving Simulator based on the most innovative technologies and equipped with redundant degrees of freedom for a proper separation between low and high frequency motions is possible thanks to a substantial investment from the [Government of the Lombardy Region](#), dedicated to sustainable mobility solutions” said prof. Ferruccio Resta, Rector of the [Politecnico di Milano](#). “The simulator will allow Software and Hardware-in-the-Loop (SiL and HiL) studies and validations, giving us the opportunity to participate together with selected partners in research projects dedicated to ground vehicle engineering, road safety and future vehicles.”

[Politecnico di Milano](#) joins the ever-growing family of adopters of [VI-grade](#)’s driving simulators, with more than 100 simulators installed at worldwide OEMs, Motorsport teams, Tier1 suppliers and Engineering/R&D Centers to accelerate product development.

The project has been promoted by the [Lombardy Mobility Cluster](#), under the supervision of the [Lombardy Region Government](#), with the aim to create a pole for serving the automotive companies of the Lombard regional cluster, ranked fourth at European level.





## Technical Tours—Continued

### ATM Milano: San Donato depot

The San Donato depot was revamped when ATM launched its “Full electric plan” aiming to replace the entire bus fleet of 1,200 electric vehicles.

By the end of the year, 90 out of the scheduled 240 e-buses as well as the “slow plug-in” charging stations will be in operation, integrated by the Battery Energy Storage System allowing optimal peak management.

Two pantograph stations for fast charging will soon be available.

Each bus follows a tailor-made maintenance planning – among which inspection, system operation check and time/mileage-based components replacement.

On the depot roof a system of photovoltaic panels is installed to supply the depot utilities such as lights, air conditioning, etc.



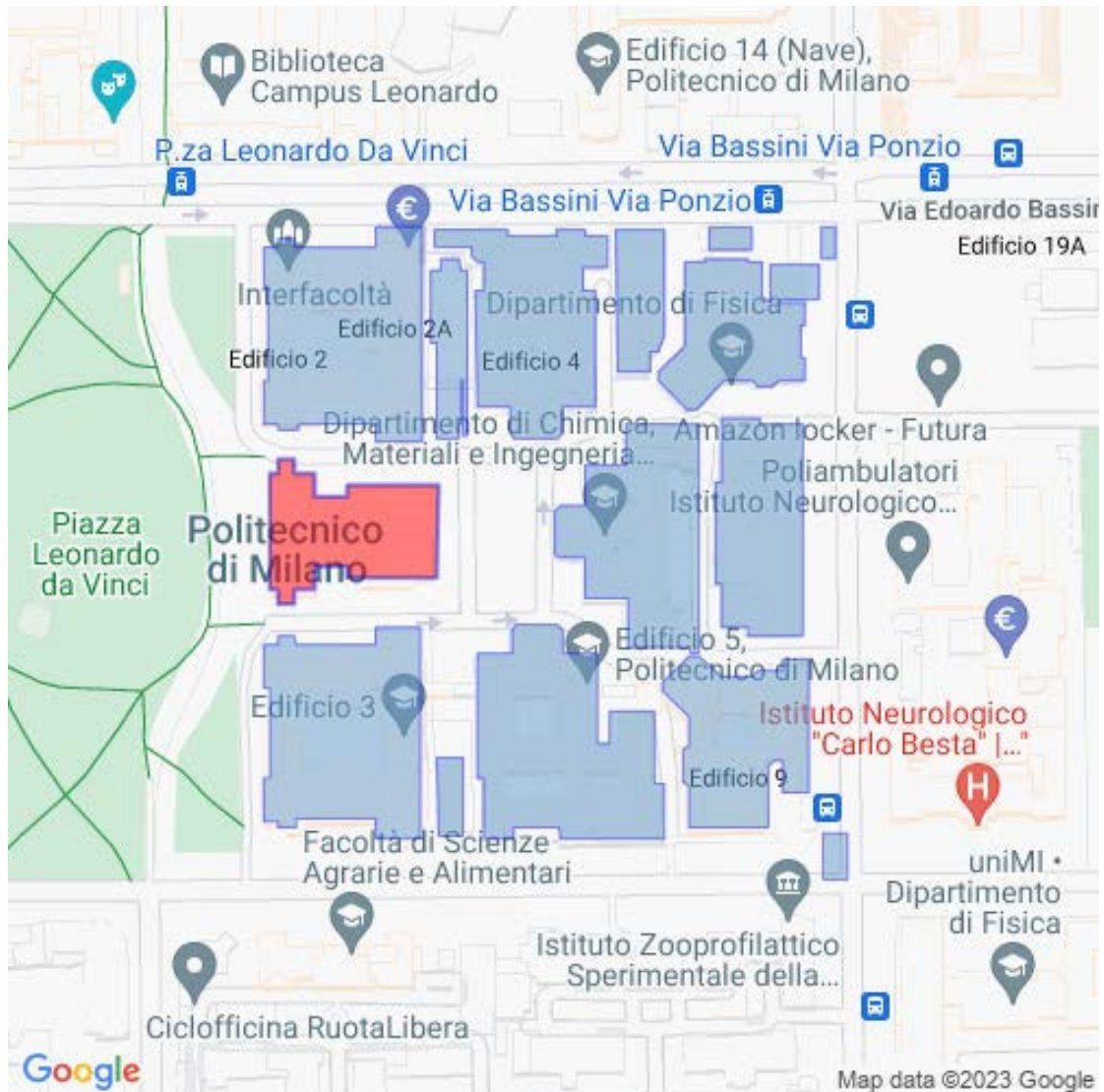
### Alfa Romeo Museum

The Museo Alfa Romeo tells the legendary story of the brand, via a project and an installation designed to reflect its values: historical presence, beauty and speed, an essential part of the Alfa Romeo Dna. As the visitors admire car after car, they travel through the company’s glorious history and also discover stories and curious facts with the help of videos, images and interactive access points, in a crescendo of emotions (<https://www.museoalfaromeo.com/it-it/Pages/MuseoStoricoAlfaRomeo.aspx>)



# How to reach the classroom AULA MAGNA

Milano - Milano Città Studi - Piazza Leonardo da Vinci 32 - Edificio 1 - Floor: Primo



# Conference Program-At-A-Glance

TUESDAY, 24 October		WEDNESDAY, 25 October		THURSDAY, 26 October		FRIDAY, 27 October	
			8:00 am - 5:30 pm	Registration		Registration	
			9:45 - 9:15 am	Opening Ceremony		Women in Vehicular Technology Forum Wenling Chang - IREX VP President Francesca Ronzolini - Politecnico di Milano	
			9:15 - 9:45 am	Keynote - Sergio Savarese - Politecnico di Milano		Keynote - Gianmarco Montanari - Fondazione Mest	
			9:45 - 10:20 am	Keynote - Stefano Ebra - FNM		Keynotes Michele Bojogni (Acqua super tech) Filippo Brighione (Vita Power)	
			10:15 - 10:40 am	Coffee Break		Coffee Break	
			10:45 - 12:25 pm	Sala Parigi Session 11 RT2-1 (SP) Sala Panama Session 12 RT2-2 (SP) Sala Madrid Session 13 RT2-3 (BP) Sala Hong Kong Session 14 S57 (BP) Sala Dubai Session 15 RT3-3 (BP)	Sala Parigi Session 16 RT2-4 (SP) Sala Panama Session 17 RT2-5 (BP) Sala Madrid Session 18 RT2-6 (BP) Sala Hong Kong Session 19 S59-1 (SP) Sala Dubai Session 20 S55 (SP)	Sala Parigi Session 21 RT3-4 (BP) Sala Panama Session 22 RT4-4 (SP) Sala Madrid Session 23 RT4-2 (SP) Sala Hong Kong Session 24 S59-2 (BP) Sala Dubai Session 25 RT2-6 (BP)	Sala Dubai Session 26 RT2-7 (BP) Sala Hong Kong Session 27 RT3-6 (BP) Sala Madrid Session 28 RT4-3 (BP)
			12:30 - 1:45 pm	Lunch		Lunch	
	2:00 PM			Registration			
				Tutorial 1			
			1:45 - 3:25 pm	Sala Parigi Session 11 RT2-2 (SP) Sala Panama Session 12 S58 (SP) Sala Madrid Session 13 RT2-3 (BP) Sala Hong Kong Session 14 RT4-1 (BP)	Sala Parigi Session 15 RT2-4 (SP) Sala Panama Session 16 RT2-5 (BP) Sala Madrid Session 17 RT4-2 (SP) Sala Hong Kong Session 18 S59-1 (SP)	Sala Parigi Session 19 RT3-4 (BP) Sala Panama Session 20 RT3-1 (BP) Sala Madrid Session 21 RT4-3 (BP) Sala Hong Kong Session 22 S59-2 (BP)	Sala Dubai Session 23 RT2-6 (BP)
			3:30 - 4:00 pm	Coffee Break		Coffee Break	
				Tutorial 2			
			4:00 - 6:00 pm	Sala Parigi Session 11 S55 (BP) Sala Panama Session 12 RT7 (BP) Sala Madrid Session 13 RT6 (BP)	Sala Parigi Session 14 RT3 (BP) Sala Panama Session 15 RT3-5 (SP) Sala Madrid Session 16 RT3-3 (BP)	Sala Parigi Session 17 RT3 (BP) Sala Panama Session 18 RT3-5 (SP) Sala Madrid Session 19 RT3-3 (BP)	Sala Dubai Session 20 S55 (BP)
			6:30 - 8:30 pm	Reception TBD		Gala Dinner	

## Technical Program Day 1 - 25 October

	PID	Title
10:45 AM - 12:25 PM	<b>Session 1, RT2-1</b>	
	<b>Co-Chairs: Alessandro Serpi (University of Cagliari, Italy) &amp; Trung Duong (ABB Corporate Research Center, Germany)</b>	
	2023002283	<p><b>High efficiency permanent magnet synchronous motor for an electrical air conditioning compressor</b></p> <p>Mohamed Khanchoul, Ilakya Elumalai, Vinothini Gurudevan, Imed Guitari, Valeo Système Thermique, France; Guillaume Krebs, GEEPS, Université Paris-Saclay, France</p>
	2023002106	<p><b>A simplified analytical approach for NVH assessment of permanent magnet synchronous motors</b></p> <p>Massimiliano Gobbi, Federico Ballo, Gianpiero Mastinu, Dario Barri, Federico Soresini, Dept. of Mechanical Engineering, Politecnico di Milano, Italy</p>
	2023002059	<p><b>A Comparative Study of Torque Estimation Algorithms for Switched Reluctance Motors</b></p> <p>Lourenço Espírito Santo, Manuel Pereira, Rui Esteves Araújo, Faculty of Engineering, University of Porto, Portugal</p>
	2023001979	<p><b>Reduced Order Electromagnetic Thermal Coupled Model of EV PMSM for Digital Twin Applications</b></p> <p>Yuan Cheng, Wan Huang, China; Bochao Du, Ziming Guan, Shumei Cui, [Institute of Electromagnetic and Electronic Technology, Harbin Institute of Technology, China</p>
	2023002100	<p><b>Influence of Modification of Dual V-shaped IPMSM Rotor Permanent Magnet Structure on Motor Performance</b></p> <p>Weili Li, Shifan Luo, Jiafeng Shen, Haoyue Tang, Baowang Huang, School of Electrical Engineering, Beijing Jiaotong University, China; Ping Yu, Jing-Jin Electric Technologies Co., Ltd, China</p>
	<b>Session 2, RT2-2</b>	
	<b>Co-Chairs: Ke Li (University of Nottingham, UK) &amp; Mario Porru (University of Cagliari, Italy)</b>	
	2023002192	<p><b>Small-signal stability analysis of shipboard power electronics-based DC microgrids</b></p> <p>Maria Carmela Di Piazza, Giuseppe La Tona, Massimiliano Luna, Department of Engineering, ICT and technologies for energy and transportation, Consiglio Nazionale delle Ricerche (CNR) - Istituto di Ingegneria del Mare (INM), Italy</p>
	2023002307	<p><b>The Effect of DAB Converter Series Inductor Configurations on the Transformer Interwinding Capacitance Voltage Waveform</b></p> <p>Claus S. Kjeldsen, Centre for Industrial Electronics (CIE), University of Southern Denmark, Denmark; Christian Østergaard, Centre for Industrial Electronics (CIE), University of Southern Denmark, Denmark</p>
	2023002522	<p><b>Wide Bandgap-Based Inverter Prototype for Variable Speed Electrical Propulsion Drives</b></p> <p>Svetomir Stevic, Niklas Driendl, Benedikt Groschup, Sebastian Mönninghoff, Hujun Peng, Kay Hameyer, Institute of Electrical Machines and Chair in Electromagnetic Energy Conversion, RWTH Aachen University, Germany; David Franck, CirQua GmbH, CirQua GmbH, Germany</p>
	2023002277	<p><b>Inductance and Power Losses Analysis of an Arm Inductor for a Modular Multilevel Converter</b></p> <p>Yang Wang, MOBI EPOWERS, Vrije Universiteit Brussel, Belgium</p>
	2023002199	<p><b>Evaluation of Permanent Magnet Motor Performances using Different Driving Cycles for Electric Vehicles</b></p> <p>Khalil Abdelali, Bachir Bendjedja, Electrical Engineering, LACOSER Laboratory, Algeria; Aissam Riyad Meddour, Nassim Rizoug, Electrical Engineering, S2ET Laboratory, ESTACA, France</p>
<b>Session 3, RT1-1</b>		
<b>Co-Chairs: João Pedro Trovão (University of Sherbrooke, Canada) &amp; Ronan German (University of Lille, France)</b>		
2023002133	<p><b>Aging Determination of Lithium Ion Batteries Based on Thermal Measurements</b></p>	

	Joanna Kozma, Roberval, Khadija El Kadri Benkara, Christophe Forgez, Roberval, Guy Friedrich, - Mechanics, Energy and Electricity , University of Technology of Compiègne, France; Rabih Dib, Nazih Moubayed, LaRGES, Faculty of Engineering, Lebanese University, Lebanon
2023001989	<b>Capacity Dispersion and Impact of Outliers in a Second Life Battery</b> Marwan Hassini, Univ Eiffel, Univ Lyon, France
2023002035	<b>Health-conscious charging of lithium-ion battery cells: using physics-based models to minimize calendar and cyclic ageing effects</b> Medina Robinson , Erik Hoedemaekers, Steven Wilkins, Powertrains, TNO, Netherlands
2023001929	<b>Limitations of the State of Health and Health Indicators for Electric Vehicle batteries</b> Maite Etxandi-Santolaya, Energy Systems Analytics, IREC, Spain; Lluc Canals Casals, Engineering Projects and Construction, UPC, Spain; Cristina Corchero, Energy Systems Analytics, IREC, Spain
2023001946	<b>High-Precision On-Board Capacity Estimation of Lithium-Ion Cells using a Fractional-Order Cell Model and Singular Value Decomposition</b> Yassine Bensaad, Fabian Friedrichs, Thorsten Baumhöfer, Judith Bähr, Battery Algorithms, Mercedes-Benz AG, Germany; Alexander Fill, Kai Peter Birke, Electrical Energy Storage, University of Stuttgart, Germany
<b>Session 4, SS2</b>	<b>Co-Chairs: Vincenzo Paolo Loschiavo (University of Sannio, Italy) &amp; Federico Zanelli (Politecnico di Milano, Italy)</b>
2023002244	<b>Performance Analysis of Linear and Rotary Energy Harvesting Shock Absorber Systems</b> Gianfranco Gagliardi, Pierluigi Manna, Paul Christian Tesso Wofo, Alessandro Casavola, DIMES, University of Calabria, Italy
2023002107	<b>Piezoelectric Energy Harvesting for Self-Supplied Tyre Sensing Applications</b> Cinzia Tamburini, Aldo Romani, ARCES, University of Bologna, Italy; Matteo Pizzotti, DEI, University of Bologna, Italy; Leena Rynnänen, Mika Penttilä, Department of Products and Innovations, Nokian Tyres Plc, Finland
2023002224	<b>Design of a linear generator for energy harvesting from interstitial space in suspensions</b> Enrico Spateri, Dipartimento di elettronica, informazione e bioingegneria, Politecnico di Milano, Italy; Giambattista Gruosso, Dipartimento di elettronica, informazione e bioingegneria, Politecnico di Milano, Italy
2023001986	<b>Enhancing Electric Vehicle Comfort with Magnetostrictive Energy Harvesting</b> Carmine Stefano Clemente, Vincenzo Paolo Loschiavo, Daniele Davino, Department of Engineering, University of Sannio, Italy
<b>Session 5, SS7</b>	<b>Co-Chairs: Gabriele Fambri (Politecnico di Torino, Italy) &amp; Fabia Miorelli (German Aerospace Center, Germany)</b>
2023002226	<b>Economic potential of V2G in electricity markets – A systematic literature review</b> Tim Signer, Felix Unger, Manuel Ruppert, Wolf Fichtner, IIP, KIT, Germany
2023002016	<b>Electric Vehicles Integration in Automatic Generation Control of Modern Power System</b> Zahid Ullah, Giambattista Gruosso, Dipartimento di Elettronica, Informazione e Bioingegneria, Politecnico di Milano, Italy; Kaleem Ullah, Department of Electrical Energy System, CASE UET Peshawar, Pakistan
2023002239	<b>Mixed Incentive-based and Direct Control Framework for EV Demand Response</b> Cesar Diaz-Londono, Andres Cordoba, Fredy Ruiz, Dipartimento di Elettronica, Informazione e Bioingegneria, Politecnico di Milano, Italy; José Vuelvas, Electronics, Pontificia Universidad Javeriana, Colombia

- 2023002215 **Model Predictive Control for EV chargers coupling electro-thermal and degradation battery models**  
Xabier Dorronsoro, Erik Garayalde, Unai Iraola, Electronics and Computer Science, Mondragon Unibertsitatea, Spain; Ricardo De Castro, Mechanical Engineering, University of California, Merced, United States; Jorge Varela, Electronic Engineering, Univesitat Politècnica de Catalunya, Spain;
- 2023002253 **Utilization Analysis of Rapid and Ultra-Rapid Electric Vehicle Chargers in Europe**  
Cesar Díaz-Londono, Giambattista Gruosso, Dipartimento di Elettronica Informazione e Bioingegneria, Politecnico di Milano, Italy; Michele Motta, Diego Pareschi, E-mobility S.p.A., ABB, Italy

**LUNCH: 12:25 PM - 13:45 PM**

01:45 PM - 03:25 PM

- Session 6, RT1-2** **Co-Chairs: Theodoros Kalogiannis (Vrije Universiteit Brussel, Belgium) & Ali Sari (University of Lyon, France)**
- 2023002147 **Equivalent Circuit Model For Sodium-Ion Batteries With Physical-Based Representations Of Their Non-Linearities**  
Houssam Rabab, Nicolas Damay, Christophe Forgez, Roberval (Mechanics, energy and electricity), Centre de recherche Royallieu, University of Technology of Compiègne, France; Asmae El Mejdoubi, Aurélien Quelin, Tiamat Energy, Tiamat Energy, France
- 2023002256 **Modeling and evaluation of dynamical properties of different energy storage systems using machine learning methods**  
Imene Benrabia, Dirk Söffker, Chair of Dynamics and Control, Duisburg Essen university, Germany
- 2023002293 **Model Order Reduction of the Doyle-Fuller-Newman Model via Proper Orthogonal Decomposition and Optimal Collocation**  
Gianluca Manduca, The BioRobotics Institute & Department of Excellence in Robotics and AI, Scuola Superiore Sant'Anna, Pisa, Italy; Zhaoxuan Zhu, Autonomy Research, Motional, United States; Polina B. Ringler, Dep. of Mechanical Engineering, Colorado School of Mines, United States; Guodong Fan, School of Mechanical Engineering, Shanghai Jiao Tong University, China; Marcello Canova, Center for Automotive Research, The Ohio State University, United States
- 2023002222 **Separating multiscale Battery dynamics and predicting multi-step ahead voltage simultaneously through a data-driven approach**  
Tushar Desai, Riccardo Ferrari, Delft Center for Systems and Control, Delft University of Technology, Netherlands
- 2023001950 **PSO Tuned Variable Forgetting Factor Recursive Least Square Estimation of 2RC Equivalent Circuit Model Parameters for Lithium ion Batteries**  
Mohamed A. A. Mohamed, Thomas Grandjean, Warwick Manufacturing Group, Warwick University, United Kingdom; Tung Fai Yu, Jaguar Land Rover, Warwick, United Kingdom
- Session 7, SS8** **Co-Chairs: Eric Hittinger (Rochester Institute of Technology, USA), & Julia Frotey (Institut National de la Recherche Scientifique, Canada)**
- 2023002320 **Charging Stations for Electric Vehicles Powered by Renewable Energy: spatial deployment, typology of infrastructures and pioneer stakeholders**  
Julia Frotey, UMR INRS-UQAR, INRS, Canada; Elodie Castex, TVES, University of Lille, France; Alain Bouscayrol, L2EP, University of Lille, France; Eric Hittinger, Arts, Rochester Institute of Technology, United States
- 2023002338 **Experimental PV-based charging station for e-bikes**  
Salma Fadili, Lauro Ferreira, Philippe Delarue, Alain Bouscayrol, Halima Ikaouassen, Electrical engineering, University of Lille, France; Frederic Bonin, Energetic, Urbik, France; Nicolas Ferlay, Meteorologie, University of Lille, France

2023002013	<b>Data-based traffic profile generation tool for electric vehicle charging stations</b> Josu Yeregui, Iosu Aizpuru, June Urkizu, Electronics and Computing, Mondragon Unibertsitatea, Spain
2023001942	<b>Simulation of Electric Vehicle Energy Consumption of Real Driving Behaviour</b> Andrea Di Martino, Energy, Politecnico di Milano, Italy; Daniele Martini, Energy, Politecnico di Milano, Italy; Michela Longo, Energy, Politecnico di Milano, Italy; Dario Zaninelli, Energy, Politecnico di Milano, Italy
2023002262	<b>Trends and Heterogeneity in Electric Vehicle Economics: a French Case Study</b> Eric Hittinger, Public Policy, Rochester Institute of Technology, United States; Ranjit Desai, Center for Mobility Sciences, National Renewable Energy Laboratory, United States; Alain Bouscayrol, Laboratoire d'Électrotechnique et d'Électronique de Puissance, University of Lille, France
<b>Session 8, RT2-3</b>	<b>Co-Chairs: Marina Mendes Perdigao (Polytech Institute of Coimbra, Portugal) &amp; Souso Kelouwani (University of Quebec at Trois-Rivières, Canada)</b>
2023002102	<b>Electric Motor Optimal Design based on Multi-physics Modelling and Artificial Intelligence</b> Massimiliano Gobbi, Giampiero Mastinu, Dept. of Mechanical Engineering, Politecnico di Milano, Italy; Antonino Di Gerlando, Dept. of Energy, Politecnico di Milano, Italy
2023002184	<b>Effective Scaling of High-Fidelity Electric Motor Models for Electric Powertrain Design Optimization</b> Olaf Borsboom, Martijn Lokker, Mauro Salazar, Theo Hofman, Mechanical Engineering, Eindhoven University of Technology, Netherlands
2023002212	<b>Comparative Study on the Effect of PMSM Scaling Choices on Electric Vehicle Energy Consumption</b> Ayoub Aroua, L2EP laboratory, University of Lille, France; Department of Electromechanical Systems and Metal Engineering, Ghent University, Belgium; Walter Lhomme, Alain Bouscayrol, L2EP laboratory, University of Lille, France; Peter Sergeant, Florian Verbelen, Kurt Stockman, Department of Electromechanical Systems and Metal Engineering, Ghent University, Belgium
2023002279	<b>Power Harmonic Component Suppression in case of Un-Ideal Electro-motive Forces</b> Paolo Meloni, Alessandro Serpi, Electrical and Electronic Engineering, University of Cagliari, Italy
2023001967	<b>Magnetic Field Orientation Compensation for Induction Motors Based on Voltage Feedback</b> Yuan Cheng, Guangshun Fu, Bochao Du, Kai Yao, School of Electrical Engineering, Harbin Institute of Technology, China; ASPMS, Chongqing Research Institute of HIT, China; Shumei Cui, School of Electrical Engineering, Harbin Institute of Technology, China
<b>Session 9</b>	<b>Open</b>
<b>Session 10, RT5-1</b>	<b>Co-Chairs: Sylvain Pagerit (Argonne National Labs, USA) &amp; Rochdi Trigui (Gustave Eiffel University, France)</b>
2023002074	<b>A method to build energy-metric-optimal (EMO) classification systems for road transport missions</b> Luigi Romano, Bengt Jacobson, Mechanics and Maritime Sciences, Chalmers University of Technology, Sweden; Manish Raathimiddi, Engineering Systems, HAN University of Applied Sciences, Netherlands; Fredrik Bruzelius, Mechanics and Maritime Sciences, Chalmers University of Technology, Sweden; Rickard Andersson, Volvo, Volvo AB, Sweden
2023002000	<b>Case Study on the Impact of the Road Gradient, Passenger Loading and Recuperation Power Limitations on the Energy Consumption of Battery Electric Buses</b>

Benjamin Martin, Denis Spiess, Samuel Würtz, Forschungszentrum Allgäu (IFA), University of Applied Sciences Kempten, Germany; Ulrich Göhner, Department of Computer Science, University of Applied Sciences Kempten, Germany; Andreas Rupp, Department of Engineering, University of Applied Sciences Kempten, Germany

2023002158 **Effect of different driving styles on the energy consumption and CO2 emission**

Michele Vignati, Federico Cheli, Mechanical Engineering, Politecnico di Milano, Italy; Valerio Matarrese, Innovation and Testing Center, Generali Jeniot, Italy; Michele Serra, Product Development, Delivery, and R&D, Generali Jeniot, Italy

2023001963 **Development of a Matlab Application for the Preliminary Design of Electric Propulsion Systems**

Andrea Floris, Salvatore Mastinu, Mario Porru, Electrical and electronic engineering, University of Cagliari, Italy

2023001959 **Real World Driving Representative Cycle Generation for Hybrid Electric Vehicles**

Egemen Karabiyik, Calibration, SW and Autonomous Technologies, AVL Research & Engineering Turkey, Turkey; Adnan Furkan Yildiz, Calibration, AVL Research & Engineering Turkey, Turkey

**COFFEE BREAK: 03:25 PM - 04:00 PM**

04:00 PM - 06:00 PM

**Session 11, SS5**

**Co-Chairs: Walter Lhomme (University of Lille, France) & Bedatri Moulik (Amity University, India)**

2023002249 **Reduced-Scale Hardware-in-the-Loop Platform for Dual-Source Off-Road Electric Vehicle using Energetic Macroscopic Representation**

Chi T. P. Nguyen, Electrical and Computer Engineering, University of Sherbrooke, Canada; Engineering School, Thainguyen University of Technology, Vietnam; Bao-Huy Nguyen, CTI Lab., Hanoi University of Science and Technology, Vietnam; e-TESS Lab, University of Sherbrooke, Canada; Joao Pedro F. Trovao, e-TESS Lab., University of Sherbrooke, Canada; INESC Coimbra, IPC ISEC, Portugal; Minh C. Ta, e-TESS Lab., University of Sherbrooke, Canada; CTI Lab., Hanoi University of Science and Technology, Vietnam

2023002323 **Energetic Macroscopic Representation Graphical Tool for Automatic Drawing**

Ruben Gonzalez-Rubio, e-TESS Lab, Department of Electrical and Computers Engineering, University of Sherbrooke, Canada; Marco Duquesne, Alain Bouscayrol, Ronan GERMAN, L2EP, Univ. Lille, France; João P. Trovão, e-TESS Lab, Department of Electrical and Computers Engineering, University of Sherbrooke, Canada; Polytechnic-Institute-of-Coimbra-(IPC-ISEC), INESC-Coimbra, Portugal; Minh C. Ta, e-TESS Lab, Department of Electrical and Computers Engineering, University of Sherbrooke, Canada

2023002214 **Fast Charge of a Battery Considering Temperature**

Ronan German, Alain Bouscayrol, L2EP, Univ. Lille, France; Abdelkader Zaouak, L2EP, Univ. Lille, France; IRH, UQTR, Canada Loic Boulon, IRH, UQTR, Canada

2023002314 **Impact of Maximal Velocity and Acceleration on Energy Consumption of a Subway Vehicle**

Ryan O. Berriel, Philippe Delarue, L2EP, Alain Bouscayrol, L2EP, Université de Lille, France; Clément Mayet, SATIE, Le CNAM – ENS Paris-Saclay, France; Charles Brocart, Evolution du métro, Métropole Européenne de Lille, France

2023001938 **Comparison of Different Braking Strategies to Improve the Energy Recovery of an Electric Vehicle based on Cascaded H-Bridge Inverter with Batteries**

Gaël Pongnot, SATIE, ENS Paris-Saclay, France; Clément Mayet, Denis Labrousse, SATIE, Conservatoire national des arts et métiers, France

2023002284 **Energy management and multi-objective optimization of a fuel cell hybrid vehicle**



<b>Session 12, RT7</b>	
<b>Co-Chairs: Christoph Hametner (TU Wien, Austria) &amp; Nadia Yousfi-Steiner (University Bourgogne Franche-Comté, France)</b>	
2023001943	<b>Adaptive Step Size Dynamic Programming for Optimal Energy Management of Fuel Cell Vehicles</b> Sandro Kofler, Zhang Peng Du, Stefan Jakubek, Institute of Mechanics and Mechatronics, TU Wien, Austria; Christoph Hametner, Christian Doppler Laboratory for Innovative Control and Monitoring of Automotive Powertrain Systems, TU Wien, Austria
2023002303	<b>A Data-Based Prognostic Technique Of A Proton Exchange Membrane Fuel Cell Applying Dynamic Load Cycle</b> Luis Perez, FEMTO-ST Institute, FCLAB, CNRS, Belfort, Université de Franche-Comté, France; Hydrogen Research Institute, Université Du Québec a Trois-Rivières, Canada; Alexandre Ravey, CNRS, institut FEMTO-ST, Belfort, UTBM, France; Javier Solano, European Institute for Energy Research (EIFER), European Institute for Energy Research (EIFER), Germany; Loïc Boulon, Hydrogen Research Institute, Université Du Québec a Trois-Rivières, Canada; Samir Jemei, FEMTO-ST Institute, FCLAB, CNRS, Belfort, Université de Franche-Comté, France
2023001925	<b>Hydrogen For Railways: an Industrial Benchmark Study</b> Luca Pugi, Michael Spedicato, Lorenzo Berzi, Dept. of Industrial Engineering, University of Florence, Italy; Francesco Cirillo, Trenitalia, Gruppo Ferrovie Dello Stato, Italy;
2023002202	<b>Designing a Hierarchical Energy Management Strategy for a Hybrid Multi-Stack Fuel Cell System</b> Mohsen Kandidayeni, Electrical and Computer Engineering, University of Sherbrooke, Canada; Electrical and Computer Engineering, University Quebec Trois-Rivières, Canada; Sousso Kelouwani, Mechanical Engineering, University of Quebec in Trois-Rivières, Canada; Loïc Boulon, Electrical and Computer Engineering, University of Quebec in Trois-Rivières, Canada; João P. Trovão, Electrical and Computer Engineering, University of Sherbrooke, Canada
2023001937	<b>Performance Assessment of a Low-Temperature PEMFC Powered Integrated Propulsion System for UAV with Inclined Cathode Flow Structure</b> Zhou Kehan, Zhiwei Liu, Nan Meng, Mingjing Qi, Jianmei Huang, Xiaojun Yan, School of energy and power engineering, Beihang University, China
2023001939	<b>Design and Implementation of Pure H<sub>2</sub>/O<sub>2</sub> Fuel Cell–Battery Hybrid Systems for Long-range AUVs</b> Laeun Kwon, Maritime Technology Research Institution, Agency for Defense Development, South Korea; Kyungdon Baik, Kiyoul Kim, Material/Energy Technology Center, Agency for Defense Development, South Korea; Jong-Gu Kang, Maritime Technology Research Institution, Agency for Defense Development, South Korea; SeungWoo Byun, Naval Business Department, Hanwha Systems, South Korea; Changsun Ahn, School of Mechanical Engineering, Pusan National University, South Korea; Daeyon Kwak, Hydrogen and Fuel Cell, Bumhan Fuel Cell, South Korea
<b>Session 13, RT6</b>	
<b>Co-Chairs: Paulo Pereirinha (INESC Coimbra, Portugal) &amp; Cedric De Cauwer (Vrije Universiteit Brussel, Belgium)</b>	
2023002217	<b>Charging Design for Battery Electric Multiple Unit: Implementation on a Real Railway Line</b> Andrea Di Martino, Alessandro Talarico, Energy, Michela Longo, Federica Foidelli Politecnico di Milano, Italy; Alessandro Borselli, Technical direction, Trenord srl, Italy; Matteo Bubici, Technical Administrative department, Rete Ferroviaria Italiana, Italy
2023002136	<b>Automotive Charger Grid-Forming Control Opportunities for G2V and V2X Applications</b> Elie FAYAD, Damian SAL Y ROSAS CELI, Antoine BRUYERE, L2EP, Centrale Lille Institute, France; Fredy POIRIER, VEES, Valeo, France

2023002318	<p><b>DC fast chargers for electric vehicles: Portuguese solution for energy metering and billing issues</b></p> <p>Paulo G. Pereirinha, Electrical Eng. Dep. , Polytechnic of Coimbra – ISEC, Portugal; INESC Coimbra, APVE, Portugal;  Luís Bernardo, CTE 85, Measuring Equip. for Electrical and Electromagnetic Quantities, Portugal; Nuno F. Costa, R&amp;D, EFACEC, Portugal; Pedro Silva, Department of Electrical and Renewable Energy, ENSE - National Entity for the Energy Sector, Portugal; José Bigares, Infrastructure and Networks Directorate, ERSE - Energy Services Regulatory Authority, Portugal; Luís F. Ribeiro, Departamento de Metrologia, IPQ - Portuguese Inst. of Quality Caparica, Portugal; Gonçalo Ferreira, Unidade de Gestão Operacional de Normalização, IPQ - Portuguese Inst. of Quality, Portugal; Vitor Ferreira, Paulo Rodrigues, Software R&amp;D, i charging, Portugal; António Matos, LABELEC, EDP, Portugal; Pedro Santos, Tecnologia e Sistemas, MOBI.E, Portugal</p>
2023001984	<p><b>Development of a Equivalent Impedance Network Reproducing the Impedance of Electric Vehicles During Active DC Charging</b></p> <p>Sebastian Dr. Jeschke, Marcel Olbrich, Michael Kleinen, Joerg Baerenfaenger, R&amp;D, EMC Test NRW GmbH, Germany</p>
2023001999	<p><b>Characterization of Multiple Integrated Pad Geometries for in-Wheel EV IPT Applications</b></p> <p>Miguel Torres, ISEC-DEE, Polytechnic Institute of Coimbra, Portugal; DEEC, Instituto de Telecomunicacoes, Portugal; Isidro Ribeiro, André Mendes, Valter Costa, Emanuel Marques, DEEC, University of Coimbra, Portugal; DEEC, Instituto de Telecomunicacoes, Portugal; Marina Perdigão, ISEC - DEE, Polytechnic Institute of Coimbra, Portugal; Coimbra, Instituto de Telecomunicacoes, Portugal</p>
2023002325	<p><b>Electric Vehicle Charging Management in Household Photovoltaic Grid-tied Installations</b></p> <p>Marco Silva, João P. Trovão, DEE, Polytechnic Institute of Coimbra, Coimbra Institute of Engineering, Portugal; ESP, INESC-Coimbra, Portugal; Filipe Cardoso, Department of Informatics and Quantitative Methods, Polytechnic Institute of Santarem - ESG, Portugal; ESP, INESC-Coimbra, Portugal; José Rosado, DEIS, Polytechnic Institute of Coimbra, Coimbra Institute of Engineering, Portugal; ESP, INESC-Coimbra, Portugal</p>
<b>Session 14, RT4-1</b>	<b>Co-Chairs: Mauro Salazar (Eindhoven University of Technology, Netherlands) &amp; Giancarlo Storti Gajani (Politecnico di Milano, Italy)</b>
2023002098	<p><b>Generic Modeling Approach for FPGA-Based Real-Time Simulations of Electric Machines</b></p> <p>Stefan Geng, Fabian Prochotta, Martin Aust, Electromobility and Electric Drives, dSPACE GmbH, Germany</p>
2023002245	<p><b>Time-optimal Design and Control of Electric Race Cars Equipped with Multi-speed Transmissions</b></p> <p>Camiel Cartignij, Mauro Salazar, Mechanical Engineering, Eindhoven University of Technology, Netherlands</p>
2023002143	<p><b>Energy management in Pontryagin’s framework for hybrid tractors during agricultural operations</b></p> <p>Stefano Radrizzani, Giulio Panzani, Lorenzo Brecciaroli, Sergio M. Savaresi, Dipartimento di Elettronica, Informazione e Bioingegneria, Politecnico di Milano, Italy</p>
2023002190	<p><b>Optimal shifting command control for two-speed Transmission Electric Vehicle</b></p> <p>Liyue Yang, Dohyun Park, Jaekwang Jung, Namwook Kim, Department of Mechanical Engineering, Hanyang University, South Korea; Heeyun Lee, Department of Mechanical Engineering, Dankook University, South Korea</p>
2023002071	<p><b>Experimental Model Identification of a Pure Electric Vehicle Using Standard Dynamometer Testing</b></p> <p>Ahmed E. Sharkawy, Ahmed M. Ali, Mostafa Sh. Asfoor, Mostafa I. Yacoub, Automotive Engineering Department, Military Technical College, Egypt</p>
2023002189	<p><b>Energy Efficiency Enhancement Through Adaptive Navigation for a Fuel-Cell Hybrid Self-Guided Vehicle</b></p>

Massinissa GRABA, Ali Amamou, Souso Kelouwani, Karem Benchikha, Bilel Allani, Kodjo Agbossou, Hydrogen Research Insitute, Université du Québec à Trois-Rivières, Canada

**Session 15, RT1-3** **Co-Chairs: Marzio Barresi (Politecnico di Milano, Italy) & Jose Vuelvas (Pontificia Universidad Javeriana, Colombia)**

- 2023001981 **Modelling, parameters identification and SOC estimation used for BMS solutions of ROMBAT LFP battery technology**  
Ruba Mircea, Sebastian Ursache, Paula Serban, Claudia Martis, Claudiu Oprea, Electrical Machines and Drives , Technical University of Cluj-Napoca, Romania; Mihai Dit, RND, ROMBAT, Romania
- 2023001923 **Simulation of the thermal behavior of NMC module under different electrical scenarios**  
Ali Abbas, LICIT-ECO7, Gustave Eiffel University, ENTPE, France; S2ET, ESTACA, France; Nassim RIZOUG, S2ET, ESTACA, France; Rochdi TRIGUI, LICIT-ECO7, Gustave Eiffel University, ENTPE, France; Eduardo REDONDO-IGLESIAS, LICIT-ECO7, Gustave Eiffel University, ENTPE, France; Serge PELISSIER, LICIT-ECO7, Gustave Eiffel University, ENTPE, France
- 2023002022 **Robust and adaptive online State-of-Health and State-of-Charge estimation of Li-ion battery cell**  
Vincent HEIRIES, Institute of Innovation on New Energies, CEA, France
- 2023002119 **A Battery Pack Balancing Control Strategy Considering Maximizing the Available Capacity of a Battery Pack**  
Siwen Chen, Shengshi Qiu, School of Automation, Nanjing University of Science and Technology, China; Di Wang, State Grid HarbinPower Supply Company, State Grid Harbin Power Supply Company, China; Kai Song, School of Electrical Engineering and Automation, Harbin Institute of Technology, China; Jinlei Sun, School of Automation, Nanjing University of Science and Technology, China; State Grid Electric Power Research Institute, State Grid Electric Power Research Institute, China; Jinda Zhu, State Grid Electric Power Research Institute, State Grid Electric Power Research Institute, China
- 2023002006 **An online application of edge-cloud computing for lithium-ion battery with SOC estimation**  
Joelton Deonei Gotz, João Pedro dos Reis Mendes, José Rodolfo Galvão, Fernanda Cristina Correa, Milton Borsato, Graduate Program in Electrical Engineering (PPGEE), Federal Technological University of Parana, Brazil; Emilson Ribeiro Viana, Graduate Program in Physics and Astronomy (PPGFA), Federal Technological University of Parana, Brazil
- 2023002072 **A SOC Estimation Method for Internal Short Circuit Battery based on EKF-FFRLS Algorithm**  
Siwen Chen, Saihan Chen, Shengshi Qiu, Jinlei Sun, School of Automation, Nanjing University of Science and Technology, China; Chao Wu, Jilei Ye, School of Energy Science and Engineering, Nanjing TECH University, China; Chang Liu, State Grid Harbin Power Supply Company, State Grid Harbin Power Supply Company, China; Chuanyu Sun, School of Electrical Engineering and Automation, Harbin Institute of Technology, China

**END OF DAY 1: 06:00 PM**

## Technical Program Day 2 - 26 October

Time	PID	Title
10:45 AM - 12:25 PM	<b>Session 16, RT2-4</b>	<b>Co-Chairs: Marina Mendes Perdigao (Polytech Institute of Coimbra, Portugal) &amp; Andrea Floris (University of Cagliari, Italy)</b>
	2023001962	Embedded controller optimization for efficient electric motor drive Hiba Houmsi, Paolo Massioni, Romain Delpoux, Lyon, Univ Lyon, INSA Lyon, Université Claude Bernard Lyon CNRS, Ampère, France; Federico Bribiesca-Argomedo, Univ Lyon, Ampère INSA Lyon, France
	2023002002	On-Line Diagnosis of Supply Voltage Stabilizing Capacitors in Automotive Electronic Systems  Marvin Rübartsch, Michael Gerten, Stephan Frei, On-board Systems Lab, TU Dortmund University, Germany
	2023002255	Constant Common-Mode Voltage Modulation Analysis and Implementation for a Dual Three-Phase Machine Maitane Carrasco, Power Electronics, Ikerlan Technology Research Centre, Spain
	<b>Session 17, RT2-5</b>	<b>Chair: Paolo Guglielmi (Politecnico di Torino, Italy)</b>
	2023001977	Comprehensive Drive of PM Synchronous Machines Under Unpredictable Dynamics Rishil Kirankumar Lakhe, Mohamad Alzayed, Electronics, Carleton University, Canada; Hicham Chaoui, Electronics, Carleton University, Canada; Texas Tech University, United States
	2023002242	Degradation validation approach for robust oil jet motor cooling designs in an automotive powertrain Stephan Schlimpert, Branimir Mrak, Bart Peremans, Bram Robberechts, Peter Theunissen, Roeland Switten, Core Lab MotionS, Flanders Make, Belgium; Richard Brenda, Michael Gahagan, Driveline, Lubrizol Ltd, United Kingdom; Steven Vanhee, Brugge, Dana Belgium NV, Belgium
	2023002101	Online Rate-Parameter Identification of Single-Pulse-Operated Switched Reluctance Generator Anupam Verma, Gopalaratnam Narayanan, Electrical Engineering, Indian Institute of Science, India
	2023002099	Design of Prefilter-based Current Controllers Attaining Maximum Bandwidth with Optimized Overshoot and Settling Time Sergei Kolesnik, Alon Kuperman, ECE, Ben-Gurion University of The Negev, Israel; Hasan Komurcugil, Computer Engineering, Eastern Mediterranean University, Turkey
	<b>Session 18, RT5-2</b>	<b>Co-Chairs: Rochdi Trigui (Gustave Eiffel University, France) &amp; Paulo Pereirinha (INESC Coimbra, Portugal)</b>
	2023002404	Eco-Driving for Inland River Transport: The Potential of Speed Optimization Louis Hyenne, Benoît Nottellet, Research and developement, Segula Technologies, France; Fabian Amoros, Research and development, Segula Technologies, France; IRENav, Ecole Navale, France; Walter Lhomme, L2EP, Université de Lille, France; Jean-Frédéric Charpentier, IRENav, Ecole Navale, France; Jean-Yves Billard, IRENav, Ecole Navale, France
	2023002047	Optimising Electric Bus Fleet Charging Using a Simulation-based Energy Consumption Model  Jônatas Augusto Manzolli, INESC Coimbra, University of Coimbra, Portugal; Wooseok Do, Department of Transportation Engineering, Keimyung University, South Korea; Luis Miranda-Moreno, Department of Civil Engineering, McGill University, Canada; João Pedro Trovão, Department of Electrical and Computer Engineering, University of Sherbrooke, Canada; Carlos Henggeler Antunes, Department of Electrical and Computer Engineering, University of Coimbra, Portugal
	2023001957	A Generic Ready Reckoner Tool for Cross-Sector Analysis of the Feasibility of Electrification of Different Modes of Transport Alex Band, Mehmet Cagin Kirca, Andrew McGordon, Energy Innovation Centre, Warwick Manufacturing Group, United Kingdom

2023002095 Assessing the Potential Consumption and Cost Benefits of Next-Generation Technologies for Medium- and Heavy-Duty Vehicles: A Vehicle-Level Perspective  
Charbel Mansour, Ehsan Islam, Ram Vijayagopal, Sylvain Pagerit, Aymeric Rousseau, Vehicle and Mobility Systems Department, Argonne National Laboratory, United States

**Session 19, SS9-1 Co-Chairs: Ricardo de Castro (UC Merced, USA) & Jonathan Brembeck (German Aerospace Center, Germany)**

2023002225 IEEE VTS Motor Vehicles Challenge 2024 - Energy and Powertrain Losses Management of an e-Racing Vehicle  
Ke Li, PEMC group, University of Nottingham, United Kingdom; Thanh Vo-Duy, School of Electrical and Electronic Engineering, Hanoi University of Science and Technology, Vietnam

2023002005 Motor Vehicle Challenge 2023: The Winning Multi-physical Energy Management Algorithm  
Daniele Michieletto, Matteo Beligoj, Ludovico Ortombina, Elia Scolaro, Giuseppe Galati, Industrial Engineering, University of Padova, Italy

2023002086 Efficient optimization-based control of a fuel cell hybrid electric vehicle with torque vectoring  
Dominik Köppel, Alexis Benaitier, Christoph Hametner, CDL for Innovative Control and Monitoring of Automotive Powertrains, TU Wien Institut für Mechanik und Mechatronik E325, Austria; Lukas Kügerl, Institute of Mechanics and Mechatronics, TU Wien Institut für Mechanik und Mechatronik E325, Austria

2023002058 Energy management algorithm for a multi-motor electric vehicle with hybrid storage  
Davide del Giudice, Luigi Piegari, Rafael Souza Baquero, DEIB, Politecnico di Milano, Italy

2023002330 Dual-MPC as Next Generation Energy Management Algorithm for Multi-Energy-Source Vehicles  
Felix Krabbes, Rick Voßwinkel, Institute of Automotive Engineering, Westsächsische Hochschule Zwickau, Germany

**Session 20, SS3 Co-Chairs: Daniel Hissel (University of Franche-Comté) & Nadia Yousfi-Steiner (University Bourgogne Franche-Comté, France)**

2023001945 Robustness Evaluation of Energy Management Strategies for Hydrogen-based Railway Vehicles  
Josu Olmos, Andoni Saez-de-Ibarra, Haizea Gaztañaga, Energy Storage and Management, Ikerlan Technology Research Centre (Basque Research and Technology Alliance), Spain; Txomin Nieva, Dimas Lopez, Product Development, CAF Power and Automation, Spain; Iosu Aizpuru, Electronics and Computing, Faculty of Engineering, Mondragon Unibertsitatea, Spain

2023001994 A new adaptive lead-lag control scheme for high current PEM hydrogen electrolyzers  
Abdelrahman M. Elhawash, Rui Esteves Araújo, FEUP & INESC TEC, Campus of the FEUP, Portugal; João Peças Lopes, FIEEE, FEUP & INESC TEC, Campus of FEUP, Porto, Portugal

2023002305 A Rule-Based Energy Management Algorithm for a Fuel Cell/Battery All-Wheel Drive Vehicle  
Mario Porru, Alessandro Serpi, Department of Electrical and Electronic Engineering, University of Cagliari, Italy

2023002060 Minimizing the Operating cost of a Hybrid Multi-Stack Fuel Cell Vehicle based on a Predictive Hierarchical Strategy  
Mohammadreza Moghadari, Electrical and Computer Engineering, UQTR, Canada; Mohsen Kandidayeni, Electrical and Computer Engineering, Université de Sherbrooke, Canada; Loïc Boulon, Electrical and Computer Engineering, UQTR, Canada; Hicham Chaoui, Dept. of Electronics, Carleton University, Canada

2023002238 Optimal powertrain sizing of hydrogen fuel cell electric coach for lifetime carbon footprint, total costs and fuel consumption minimization  
Shantanu Pardhi, Mohamed El Baghdadi, Omar Hegazy, ETEC, Vrije Universiteit Brussel (VUB), Belgium

**LUNCH: 12:25 PM - 13:45 PM**

PM - 03:25 PM

**Session 21, RT1-4 Co-Chairs: Ronan German (University of Lille, France) & Cesar Diaz-Londono (Politecnico di Milano, Italy)**

2023002039 Feasibility Analysis of a More Sustainable Urban E-Vehicle: Combining Compressed Air Storage with Supercapacitor

- Elena Moscatelli, Industrial Engineering, University of Bologna, Italy; Alessandro Soldati, Matteo Dalboni, Carlo Concari, Engineering and Architecture, University of Parma, Italy
- 2023002029 **Round-Trip Energy Efficiency and Energy-Efficiency Fade Estimation for Battery Passport**
- Camiel Beckers, Erik Hoedemaekers, Powertrains Department, TNO, Netherlands; Arda Dagkılıç, VDL Enabling Transport Solutions, Netherlands; Henk Jan Bergveld, NXP Semiconductors, Netherlands; Department of Electrical Engineering, Eindhoven University Technology, Netherlands
- 2023002348 **Societal impacts of batteries in transportation frameworks**
- Clotilde Robert, FEMTO-ST, Université de Franche-Comté, France; Electrical, GAUSSIN OGROUP, France; Alexandre Ravey, FEMTO-ST, UTBM, France; Raphaël Perey, Electrical, GAUSSIN GROUP, France; Daniel Hissel, FEMTO-ST, Université de Franche-Comté, France
- 2023002088 **Investigating the relationship between battery safety and coolant conductivity at external short circuits**
- Jiacheng He, Theodoros Kalogiannis, ETEC, Vrije Universiteit Brussel, Belgium; Sander Clerick, Parviz Gohari Derakhshandeh, Guy Buytaert, Arteco, Arteco, Belgium; Maitane Berecibar, ETEC, Vrije Universiteit Brussel, Belgium
- 2023002281 **Evaluation of Dual-Chemistry Battery Storage System for Electric Vehicles Charging Stations**
- Edoardo Ferri, Silvia Colnago, Simone Barcellona, Luigi Piegari, DEIB, Politecnico di Milano, Italy

**Session 22,  
RT3-2**

**Chair: Clément Mayet (University of Lille, France)**

- 2023002064 **Control Method of Urban Rail Energy Storage System Based on Real-time Correction of Train Timetable and Train Power Following**
- Luqing Jiang, Fei Lin, Zhongping Yang, Kaiqi Sun, Jiaying Ren, Lu Li, School of Electrical Engineering, Beijing Jiaotong University, China
- 2023002078 **Regenerative Energy Feedback and Energy Storage Collaborative System for Urban Rail Transit**
- Jiaying Ren, Fei Lin, Zhongping Yang, School of Electrical Engineering, Beijing Jiaotong University, China
- 2023002050 **K-Means Clustering Based Urban Rail Train Operation Condition Identification Method**
- Yan Li, Zhongping Yang, Fei Lin, Luqing Jiang, Kaiqi Sun, School of Electrical Engineering, Beijing Jiaotong University, China
- 2023002181 **An Integrated Platform for the Simulation of Multimodal Trains on Discontinuously Electrified Railway Lines**
- Luca Pugi, Massimo Delogu, Luca Dicarolo, Dept. of Industrial Engineering, University of Florence, Italy; Hamed Jafari Kaleybar, Morris Brenna, Dept. of Energetics, Politecnico di Milano, Italy
- 2023002004 **A Reactive Power Optimization Method for AC Metro Power Supply System Based on Particle Swarm Optimization Algorithm**
- Feng Ding, Haiqi Zhou, Sheng Lin, School of Electrical Engineering, Southwest Jiaotong University, China

**Session 23,  
RT4-2**

**Co-Chairs: Walter Lhomme (University of Lille, France) & Souso Kelouwani (University of Quebec at Trois-Rivières, Canada)**

- 2023002300 **A Fast Multi-Objective Trip Management Strategy for Electric Vehicles**
- Luis Alfredo Wulf Ribelles, Automotive Research and Advanced Engineering, Stellantis, France; PRISME Laboratory, Univ. Orléans, France; Guillaume Colin, PRISME Laboratory, Univ. Orléans, France; Antoine Simon, Automotive Research and Advanced Engineering, Stellantis, France; Dominique Nelson-Gruel, PRISME Laboratory, Univ. Orléans, France; Vivek Jairazbhoy, Automotive Research and Advanced Engineering, Stellantis, United States; Yann Chamailard, PRISME Laboratory, Univ. Orléans, France
- 2023001987 **Energy-aware Time-optimal Routing of Battery Electric Trolley Trucks**
- Finn Vehlhaber, Mauro Salazar, Mechanical Engineering, Eindhoven University of Technology, Netherlands
- 2023002232 **Learning-Based Frameworks for Minimizing Pollutant Emissions in Hybrid Electric Vehicles for Dynamic Driving Conditions**
- Ganesh Sundaram, Tobias Gehra, Mirjan Heubaum, Jonas Ulmen, Daniel Gorges, Michael Günthner, Institute of Vehicle Propulsion Systems, RPTU Kaiserslautern-Landau, Germany

2023002250 Torque Distribution Prediction for Dual-Motor Electric Vehicle Using Ensemble Learning Algorithms  
Marouane Adnane, Ahmed Khoumsi, e-TESC Lab., University of Sherbrooke, Canada; Chi T. P. Nguyen, e-TESC Lab., University of Sherbrooke, Canada; Engineering School, Thai Nguyen University, Vietnam; Joao Pedro F. Trovao, e-TESC Lab., University of Sherbrooke, Canada; INESC Coimbra, IPC- ISEC, Canada

2023002090 A systemic approach for hybrid energy management strategy based on a deep neural network  
Driss Laraqui, Bruno Jeanneret, Rochdi Trigui, Sylvain Gillet, AME, Université Gustave Eiffel, France

**Session 24, SS9-2 Co-Chairs: Ricardo de Castro (UC Merced, USA) & Jakub Tobolar (German Aerospace Center, Germany)**

2023002077 Design of a rule-based energy management system for a 3-motor vehicle with a battery and a fuel cell: IEEE Motor Vehicle Challenge 2023  
Mariagrazia Tristano, Dept. of Engineering and Maths, Sheffield Hallam University, United Kingdom; Basilio Lenzo, Department of Industrial Engineering, Università di Padova, Italy

2023001948 Torque Allocation and Energy Management Strategy for a Multi-Motor Electric Vehicle  
Simone Barcellona, Marzio Barresi, Silvia Colnago, DEIB, Politecnico di Milano, Italy

2023002171 A General-Purpose Control Strategy for Multi-Motor EV Equipped with Fuel Cell and Battery  
Riccardo Scalabrin, Holguer Noriega, Samuele Grillo, Department of Electronics, Information and Bioengineering, Politecnico di Milano, Italy

2023002269 A Pseudo-Optimal Control Strategy to Solve the 2023 IEEE VTS Motor Vehicles Challenge  
Iman Ebrahimi, Ricardo de Castro, Mechanical Engineering, University of California, Merced, United States

**Session 25, RT2-6 Co-Chairs: Alessandro Serpi (University of Cagliari, Italy) & Ke Li (University of Nottingham, UK)**

2023002287 A 48V/360A Power Module-Based Paralleled-GaN Devices for Low-Voltage and High-Current Traction Inverter Applications  
TRAN TUAN, Kritika Deepak, Olcay Bay, Duong Trab, Mohamed EL BAGHDADI, Omar Hegazy, ETEC, Vrije Universiteit Brussel, Belgium

2023001985 Multi-domain Simulation of Integrated Power Electronics Modules for EMC and EMI Analysis  
Giovanni Minardi, Giuseppe Greco, Giovanni Vinci, Andrea Cusumano, STMicroelectronics S.r.l., STMicroelectronics S.r.l., Italy; Santi Agatino Rizzo, Gino Sorbello, Nunzio Salerno, DIEI, University of Catania, Italy

2023002290 Technical Assessment of Thermal Management Techniques for GaN Power Transistors: Heat Spreaders  
Omar Hegazy, Gamze Egin Martin, ETEC & MPOBI-EPOWERS, VUB, Belgium; Mohamed El Baghdadi, ETEC& MOBI-EPOWERS, VUB, Belgium; Olcay Bay, ETEC Dept., & MOBI-EPOWERS Research Group, Vrije Universiteit Brussel (VUB), Belgium

2023002001 Voltage Stability Metric for Automated Evaluation of Automotive Power Supply Systems  
Michael Gerten, Marvin Rübartsch, Stephan Frei, On-board Systems Lab, TU Dortmund University, Germany

2023002155 Development of PWM Module to Apply High-Performance RSPWM Control Method of Dual Inverter  
Eun-Su Jun, Dong Hwi Lim, Nam Eok Heo, Electrification Platform Team2, Hyundai Autoever, South Korea

**COFFEE BREAK: 03:25 PM - 04:00 PM**

**00 PM - 06:00 PM**

**Session 26, RT8-1 Co-Chairs: Michele Vignati (Politecnico di Milano, Italy) & Cedric De Cauwer (Vrije Universiteit Brussel, Belgium)**

2023001944 Analysis of communication delays in roadside detection systems for cooperative AEB implementation  
Daniele Vignarca, Stefano Arrigoni, Michele Vignati, Edoardo Sabbioni, Mechanical Engineering Department, Politecnico di Milano, Italy

- 2023002218 **On the Employment of Imaging Sensors for Cooperative V2V Beam Alignment**  
Giovanni Ciaramitaro, Mattia Brambilla, DEIB, Politecnico di Milano, Italy; Monica Nicoli, DIG, Politecnico di Milano, Italy
- 2023001970 **On the development of a diagnostic system for Condition Based Maintenance of passenger trains**  
Federico Zanelli, Francesco Castelli-Dezza, Marco Mauri, Nicola Debattisti, Department of Mechanical Engineering, Politecnico di Milano, Italy; Luca Labbadia, Research&Development, Trenitalia S.p.A., Italy; Irino Mazzucco, Research & Development, Sitav S.p.A., Italy
- 2023002061 **GPS Accuracy of the Latest C-V2X Units for V2X Applications**  
Zachary Choffin, William Riley, Department of Electrical and Computer Engineering, The University of Alabama, United States; Alexander Hainen, Department of Civil, Construction and Environmental Engineering, The University of Alabama, United States; Bharat Balasubramanian, Joshua Bittle, Department of Mechanical Engineering, The University of Alabama, United States; Han-Shin Jo, Department of Automotive Engineering, Hanyang University, South Korea; Nathan Jeong, Department of Electrical and Computer Engineering, The University of Alabama, United States
- 2023001997 **Proactive Eco-driving Control of an Autonomous Electric Vehicle in Presence of Signalized Intersections and Preceding Vehicles**  
Simin Hesami, Majid Vafaiepour, Cedric De Cauwer, Evy Rombaut, Lieselot Vanhaverbeke, Thierry Coosemans, MOBI Research Center, Vrije Universiteit Brussel, Belgium
- 2023002094 **Virtual Partner for supporting energy efficient driving in public transport buses**  
Mathias Herget, Raphael Kress, Lukas Böhning, Ulf Schwalbe, Department of Electrical Engineering and Information Technology, University of Applied Sciences Fulda, Germany
- Session 27, Co-Chairs: Ali Sari (University of Lyon, France) & Theodoros Kalogiannis (Vrije Universiteit Brussel, RT1-5 Belgium)**
- 2023002038 **Model-based Optimization of a Series-hybrid High-performance Vehicle Powertrain with Hybrid Energy Storage System**  
Elena Moscatelli, Industrial Engineering, University of Bologna, Italy; Alessandro Soldati, Matteo Dalboni, Carlo Concari, Engineering and Architecture, University of Parma, Italy
- 2023002117 **Lithium ion Battery Aging Prediction with Electrochemical Models: P2D vs SPMe**  
Clara Rojas, Laura Oca, Josu Yeregui, Unai Iraola, Iker Lopetegi, Electronics and Computer Science Department, Mondragon Unibertsitatea, Spain; Eduardo Miguel, Electrical Energy Storage, Ikerlan Technology Research Centre, Spain; Gregory Plett, Michael Trimboli, Electrical and Computer Engineering, University of Colorado, Colorado Springs, United States
- 2023002268 **Virtual Temperature Sensor in Battery Thermal Management System Using LSTM-DNN**  
Safieh Bamati, Hicham Chaoui, Department of Electronics, Carleton University, Canada; Hamid Gualous, LUSAC Laboratory, Université de Caen Normandie, France
- 2023002089 **Modeling and experimental evaluations of liquid coolants for battery thermal management**  
Theodoros Kalogiannis, Jiacheng He, Maitane Berecibar, Joeri Van Mierlo, ETEC, VUB, Belgium; Luciane Sopchenski Santos, Annick Hubin, Herman Terry, MACH, VUB, Belgium; Sander Clerick, Parviz Gohari Derakhshandeh, Guy Buytaert, ARTECO, ARTECO, Belgium
- 2023002316 **Comparative study between Unscented Kalman Filter and Multi-Layer Perceptron applied in an electric vehicle simulation with pack parameters generated from the database**  
Kawe Monteiro de Souza, Dept. Postgraduate Degree in Electrical Engineering, State University of Londrina (UEL), Brazil; José Rodolfo Galvão, DAELE, UTFPR, Brazil; Jorge Augusto Pessatto Mondadori, Paulo Broniera Junior, Laboratory LAPSEE-PIM, Senai Institute of Information and Communication Technology (ISTIC), Brazil; Fernanda Cristina Corrêa, DAELE, Graduate Program in Electrical Engineering (PPGEE) Federal University of Technology (UTFPR), Brazil; Maria Bernadete de Moraes França, Dept. Postgraduate Degree in Electrical Engineering, State University of Londrina (UEL), Brazil
- Session 28, Co-Chairs: Namwook Kim (Hanyang University, South Korea) & Emmanuel Vinot (Gustave Eiffel RT5-3 University, France)**
- 2023002052 **Investigation on the Effect of PAC2002 Tire Force Modelling on High-Power AWD Electric Vehicle Longitudinal Performance**



- Marco Veliz Castro, Reza Nasiri-Zarandi, Narayan Kar, Electrical and Computer Engineering, University of Windsor, Canada; Bruce Minaker, Mechanical, Automotive, and Materials Engineering, University of Windsor, Canada
- 2023001982 **Experimental calibration and validation of an average-speed fuel consumption model based on synthetic driving-cycles**  
Stefano Radrizzani, Dipartimento di Elettronica, Informazione e Bioingegneria, Politecnico di Milano, Italy; Max Schrader, Joshua A. Bittle, Department of Mechanical Engineering, The University of Alabama, United States
- 2023002258 **Resource-Saving Modeling of an Electronic Fuse in Vehicular Power Systems**  
Martin Baumann, Ali Shoar Abouzari, Christoph Mayer, Research and Development, BMW AG, Germany; Shashank Singh Shekhawat, Research and Development, Technische Universität München, Germany; Leo Tassilo Peters, Hans-Georg Herzog, Energy Conversion Technology, Technische Universität München, Germany
- 2023002075 **Stochastic modeling of mission stops and variable cargo weight for heavy-duty trucks**  
Luigi Romano, Fredrik Bruzelius, Mechanics and Maritime Sciences, Chalmers University of Technology, Sweden; Carl Emvin, Rickard Andersson, Volvo, Volvo AB, Sweden; Pär Johannesson, Mechanical research and innovation, RISE Research Institute of Sweden, Sweden; Bengt Jacobson, Mechanics and Maritime Sciences, Chalmers University of Technology, Sweden
- 2023002280 **Advanced Digital Twin Framework for Electric Truck**  
Duong Tran, ETEC, MOBI, VUB, Belgium; Leo Xenakis, R&D, AVL Graz, Austria; Shantanu Pardhi, ETEC, MOBI, VUB, Belgium; Iban Vicente Makazaga, R&D, TECNALIA, Spain; Michael Glensvig, R&D, AVL Graz, Austria; Hans-Michael Koegeler, R&D, AVL Graz, Austria; Róbinson Medina, Powertrains, TNO, Netherlands; Steven Wilkins, Powertrains, TNO, Netherlands; Omar Hegazy, ETEC, MOBI, VUB, Belgium
- 2023002679 **Effect of Rider Position on the Energy Consumption of an Electric Motorcycle**  
Mehmet Cagin Kirca, Andrew McGordon, WMG, University of Warwick, United Kingdom

**Session 29, Co-Chairs: Mauro Salazar (Eindhoven University of Technology, Netherlands) & Giancarlo Storti RT4-3 Gajani (Politecnico di Milano, Italy)**

- 2023002056 **Thermomechanical model predictive cascade control for blended braking of an IWM vehicle**  
Mattia Belloni, Luca Braccacia, Michele Vignati, Davide Tarsitano, Department of Mechanical Engineering, Politecnico di Milano, Italy
- 2023002012 **Nonlinear Predictive Torque Vectoring with Brake Blending for Electric Road Vehicles**  
Marko Švec, Bruno Vilic Belina, Šandor Ileš, Jadranko Matuško, Department of Electrical Drives, Machines and Automation, University of Zagreb Faculty of Electrical Engineering and Computing, Croatia
- 2023002105 **Adaptive Energy Management System based on Pontryagin's Minimum Principle for Battery/Supercapacitor Electric Vehicle Considering Topographic Information**  
Ashruti Upadhyaya, Chitralkha Mahanta, Electronics and Electrical Engineering, Indian Institute of Technology, Guwahati, India
- 2023002069 **Optimal Power Synergy For Pure Electric Vehicles Using on-board LiC:A genetic Algorithm Approach**  
Ahmed E. Sharkawy, Mostafa Sh. Asfoor, Mostafa I. Yacoub, Ahmed M. Ali, Automotive Engineering Department, Military Technical College, Egypt
- 2023002070 **Minimal capacity loss of electric vehicle battery under combined driving cycles**  
Mohammed I. Tawfik, Ahmed M. Ali, Mostafa Sh. Asfoor, Automotive Engineering Department, Military Technical College, Egypt; Ahmed Abdel-Rahim, Civil & Environmental Engineering Dept., University of Idaho Moscow, Egypt

**Session 30, Co-Chairs: Trung Duong (ABB Corporate Research Center) & Ji-Young Lee (University of Science SS1 and Technology, South Korea)**

- 2023002308 **The Common-Mode Voltage Reduction Method for Two-Stage Power Conversion System**  
Hyeong-Jin Kim, Air Mobility Electric-motor & Drive Research Team, Korea Electrotechnology Research Institute, South Korea; Yung-Deug Son, Department of Mechanical Facility Control Engineering, Korea University of Technology and Education, South Korea; Jae-Beom Kang, Ji-Young Lee, Energy and Power Conversion Engineering Department, University of Science and Technology, South Korea; Jang-Mok Kim, Department of Electrical and Electronics Engineering, Pusan National University, South Korea

**2023002169 Harmonic Analysis of Laboratory-Based Power System Utilizing Passive Filter for High-Speed Railway Traction Applications**

Vu-Khanh Tran, Energy and Power Conversion Engineering, University of Science and Technology, South Korea; Jae-Gil Lee, Sarbajit Paul, Pil-Wan Han, Yon-Do Chun, Electric Machine and Drive System Research Center, Korea Electrotechnology Research Institute, South Korea; Xuan-Truong Luong, Energy and Power Conversion Engineering, University of Science and Technology, South Korea; Jung-Hwan Chang, Mechatronics System Research Laboratory, Electrical Engineering Department, Dong-A University, South Korea

**2023002310 Influence of Outer Diameter to Stack Length Ratio on the Output Performance of Brushless Permanent Magnet Motor**

TUNG NGUYEN, Ji-Young Lee, Ji-Heon Lee, Jae-Beom Kang, Hyeong-Jin Kim, Air Mobility Electric-machine & Drive Research Team, Korea Electrotechnology Research Institute, South Korea

**2023001990 Thermal analysis of air-cooled motor for UAV using Numerical and Experimental methods**

Jae-Beom Kang, Ji-Young Lee, Tung Nguyen, Energy and Power Conversion Engineering, University of Science and Technology, South Korea; Ji-Heon Lee, Hyeong-Jin Kim, Air Mobility Electric-motor & Drive Research Team, Korea Electrotechnology Research Institute, South Korea

**2023002247 Review of Linear Electromagnetic Actuators for Distribution Grid Control and Protection Apparatus**

Trung Duong, Arda Tueysuez, Christoph Budde, Distribution Solution, ABB Corporate Research Center, Germany

**END OF DAY 2: 06:00 PM**

## Technical Program Day 3 - 27 October

Time	PID	Title
10:45 AM - 12:25 PM	<b>Session 31, RT5-4</b>	<b>Co-Chairs: Sylvain Pagerit (Argonne National Labs, USA) &amp; Namwook Kim (Hanyang University, South Korea)</b>
	2023002227	Digital Battery Passport as an Enabler of Environmental Impact Assessment in Electric Vehicle Applications Cyrine Soufi, Tedjani Mesbahi, Ahmed Samet, Electrical Engineering , INSA Strasbourg, France
	2023002104	Prognostic and Health Management of an Aircraft Turbofan Engine Using Machine Learning  Unnati Thakkar, Hicham Chaoui, Electronics, Carleton University, Canada
	2023002195	Frequency-Dependent Evaluation of the Voltage Stability in Vehicular Power Systems  Christoph Mayer, Hans-Georg Herzog, Institute of Energy Conversion Technology, Technical University of Munich (TUM), Germany; Martin Baumann , Research & Development, BMW Group, Germany
	2023002135	Impact of riding posture and regenerative braking on electric motorcycle energy consumption Shilei Zhou, Truong Quang Dinh, Tao Zhu, Mehmet Cagin Kirca, Andrew McGordon, WMG, University of Warwick, United Kingdom
	2023001980	MPS Analysis of Magneto-Rheological Fluid Magnetization Anisotropies Giovanni Imberti, Henrique De Carvalho, Massimiliana Carello, DIMEAS, Politecnico di Torino, Italy
	<b>Session 32, RT4-4</b>	<b>Co-Chairs: Bedatri Moulik (Amity University, India) &amp; Marie Hebert (University of Quebec at Trois-Rivières, Canada)</b>
	2023002015	An Optimal Approach to Energy Management of a Hybrid Fuel-Cell Competition Vehicle  Francesco Cerrito, Massimo Canale, Department of Control and Computer Engineering, Politecnico di Torino, Italy; Massimiliana Carello, Department of Mechanical and Aerospace Engineering, Politecnico di Torino, Italy
	2023002298	A Proposed Strategy For The Optimal Control Of Regenerative Braking In Electric Vehicle Based On Driving Style Juan Valladolid, Azuay, Universidad Politecnica Salesiana, Ecuador; Jose Macas, Azuay, Universidad Politecnica Salesiana, Ecuador
	2023002248	Design of Energy Management System and Software Validation for Series-Hybrid Tractor Powertrain Marziyeh Hemmati, Giambattista Gruosso, Prateek Pati, Giancarlo Storti Gajani, Dipartimento di Elettronica, Informazione e Bioingegneria, politecnico di milano, Italy
2023002084	A Deep Concurrent Learning-based Robust and Optimal Energy Management Strategy for Hybrid Energy Storage Systems in Plug-in Hybrid Electric Vehicles  Nilanjan Mukherjee, Centre of Excellence in Artificial Intelligence, IIT KHARAGPUR, India	
2023002066	Intelligent power management of E-fleets using V2X-disseminated updates of route driving cycle  Ahmed Ali, Mohamed Tawfik, Mostafa Asfour, Automotive Engineering, Military Technical College, Egypt; Bedatri Moulik, Electric and Electronic Enigneering, Amity University, India; Ahmed Abdel-Rahim, Transportation Engineering, University of Idaho, United States	
<b>Session 33, RT8-2</b>	<b>Co-Chairs: Federica Foidelli (Politecnico di Milano, Italy) &amp; Clément Mayet (University of Lille, France)</b>	
2023002045	Active Collaborative Recovery Method of Regenerative Braking Energy by Multiple Energy Storage Systems in Urban Railway Kaiqi Sun, Zhongping Yang, Fei Lin, Luqing Jiang, Haocheng Guo, Hailiang Zhang, School of Electrical Engineering, Beijing Jiaotong University , China	
2023005555	Experimental study of wear rate between copper impregnated graphite and copper	

Theo Kziazyk, Pierre-Henri Cornuault, Eric Gavignet, Univ. Franche-Comte; Philippe Baucour, Didier Chamagne, University of Franche-Comte

2023002207 **Substation Voltage Optimization Strategy in Traction Power Supply System with Bidirectional Converter Devices**

Kuo Wang, Fei Lin, Zhongping Yang, Ping Fu, School of Electrical Engineering, Beijing Jiaotong University, China; Tingting Wang, Xiong Wei, CRRC Qingdao Sifang Vehicle Research Institute Co., Ltd, CRRC Qingdao Sifang Vehicle Research Institute Co., Ltd, China

2023002125 **Robust Control Method for Mitigating Disturbances Caused by Renewable Energy Sources in AC Railway Systems**

Hamed Jafari Kaleybar, Morris Brenna, Federica Foidadelli, Dario Zaninelli, Energy, Politecnico di Milano, Italy

**Session 34, RT1-6 Co-Chairs: João Pedro Trovão (University of Sherbrooke, Canada) & Ronan German (University of Lille, France)**

2023002003 **A Two-dimensional Spatial Optimization Framework for Vehicle Powertrain Systems**

Jorn van Kampen, Mauro Salazar, Theo Hofman, Mechanical Engineering, Eindhoven University of Technology, Netherlands

2023002299 **Optimal Sizing of Li-ion Capacitor for Off-road Electric Vehicles**

Huy-Ngoc Duong, Bao-Huy NGUYEN, Thanh Vo-Duy, School of Electrical and Electronic Engineering, Hanoi University of Science and Technology, Vietnam; Minh Ta, Joao Trovao, e-TESC Lab, Université de Sherbrooke, Canada

2023002260 **Long-term Forecasting of a Degradation Indicator for Proton Exchange Membrane Fuel Cells**

Diana Sofia Mendoza, Nadia Yousfi Steiner, Damien Chanal, Daniel Hissel, Marie-Cécile Péra, Didier Chamagne, FEMTO-ST, FCLAB, Université Franche Comté, France; Elodie Pahon, FEMTO-ST, FCLAB, Université de technologie de Belfort Montbéliard, France

2023002322 **Optimal multi-criteria management of energy storage systems in a micro-grid**

Nathan CÉLIÉ, Electrical Engineering, INSA Lyon, France; Margot GAETANI-LISEO, Ali SARI, Laboratoire Ampère, Université Claude Bernard Lyon 1, France; Amine LAHYANI, Laboratoire des Systèmes Electriques, INSAT of Tunis, Tunisia

2023002677 **Application of the Theory of Inventive Problem Solving (TRIZ) to Enhance Understanding of Li-Ion Battery Thermal Runaway in Electric Vehicle Applications**

Mourtada Seck, Tedjani Mesbahi, Sébastien Dubois, Hicham Chibane, INSA Strasbourg, ICUBE, France

**Session 35, RT2-7 Co-Chairs: Alessandro Serpi (University of Cagliari, Italy) & Paolo Guglielmi (Politecnico di Torino, Italy)**

2023002301 **Current Sensor Fault diagnosis of MUPMSM Drive System Using Similarity Learning**

Yutao Du, EE, Tsinghua university, China

2023002275 **Synchronization Control of Dual Motor Driving Steer by Wire System**

Insu Chung, Sunyeop Lee, Kanghyun Nam, School of Mechanical Engineering, Yeungnam University, South Korea; Younghoon Seo, Sehoon Oh, Department of Robotics and Mechatronics Engineering, Deagu Gyeongbuk Institute of Science & Technology, South Korea

2023001931 **Sensorless Field Oriented Control for an Induction Motor Drive using an Ideal Voltage Integration Scheme with a Dynamic Stabilising Feedback**

Kella Srinuprasad, Jose Titus, Electrical Engineering, Indian Institute of Technology Hyderabad, India

2023001998 **Modeling and Measurement of Bearing Voltage in Traction Motor for High Speed Train**

Zhihao Li, Ruifang Liu, Weili Li, School of Electrical Engineering, Beijing Jiaotong University, China; Liangliang Zhang, Jing-Jin Electric Technologies Co. Ltd, Jing-Jin Electric Technologies Co. Ltd, China

2023002091 **Fault Tolerant Control of PMSM Drive based on Voltage Sensor for Electric Vehicle Application**

Bachir Bendjedja, LACOSERE laboratory, University of Amar Thelidji, Algeria; Saad Chouireb, Electromechanical department, University of Amar Thelidji, Algeria; Nassim Rizoug, ESTACA laboratory, ESTACA, France

**LUNCH: 12:25 PM - 13:45 PM**

**Technical Tours Begin**

## Technical Program Virtual Session

PID	Title
<b>Virtual Session</b>	
1	<p><b>2023002033 Adaptive multi-objective optimization strategy for real-time energy management of fuel cell</b> Sida Li, Xuezhe Wei, Haifeng Dai, School of Automotive Studies, Tongji University, China</p>
2	<p><b>2023002027 Challenges in Protocol Standardization for Intelligent Transport Systems</b> Jonas Vogt, Hans D. Schotten, Division of Wireless Communications and Radio Positioning (WiCoN), University of</p>
3	<p><b>2023002037 Configuration Ratio of Grid-following/forming Control for High-penetration Renewable Energy</b> Mengqi Zhao, Puyu Wang, Tianming Gu, School of Automation, Nanjing University of Science and Technology, China; Dejian</p>
4	<p><b>2023002126 Cycle Aging Effect on the Open Circuit Voltage of a LiFePO4 Battery</b> Simone Barcellona, Silvia Colnago, Luigi Piegari, DEIB, Politecnico di Milano, Italy; Emanuele Fedele, Diego Iannuzzi, Mattia Ribera, DIETI, Università di Napoli Federico II, Italy</p>
5	<p><b>2023002208 Enhanced Fuzzy-MFC-based Traction Control System for Electric Vehicles</b> Nam T. Nguyen, Thanh Vo-Duy, Department of Automation Engineering, Hanoi University of Science and Technology, Vietnam; Minh C. Ta, Department of Electrical Engineering and Computer Engineering, University of Sherbrooke, Canada; Valentin Ivanov, Automotive Engineering Group, Technische Universität Ilmenau, Germany</p>
6	<p><b>2023002055 Multiple fuzzy adaptive decoupled control of high-power commercial vehicular fuel cell engine</b> Zhaoming Liu, Guofeng Chang, Hao Yuan, Wei Tang, Xuezhe Wei, Haifeng Dai, School of Automotive Studies, Tongji University, China; Jiaping Xie, Haidriver Energy Technology, Haidriver Energy Technology, China</p>
7	<p><b>2023002137 Optmization algorithm for the charging management of electric vehicles in multi-dwelling residential buildings.</b> Salvador Carvalhosa, José Rui Ferreira, Rui Esteves Araújo, CPES, INESC-TEC, Portugal</p>
8	<p><b>2023002008 Optimal Operation of Electric Vehicle Charging Stations with Variable Distributed Energy Resources in Constrained Electricity and Transportation Networks</b> Mohammad Shahidehpour, Larissa Affolabi, ECE, Illinois Institute of Technology, United States; Farrokh Rahimi, Kash Nodehi, Sasan Mokhtari, Smart Grid, OATI, United States</p>
9	<p><b>2023001991 Dynamic Optimization of Fuel Cell Operating Conditions at Different Altitudes</b> Jinzhou Chen, Hongwen He, Shengwei Quan, Zhongbao Wei, Zhendong Zhang, Jun Zhang, School of Mechanical Engineering, Beijing Institute of Technology, China</p>
10	<p><b>2023002034 Operando temperature monitoring through optical fiber sensor in lithium-ion battery</b> Xiuwu Wang, School of Automotive Studies, Tongji University, China</p>
11	<p><b>2023002141 Comprehensive Experimental Study on Shaft Voltage of Traction Motor with Ceramic Bearing for Electric Vehicles</b> Jun-Woo Chin, Deok-Jin Kim, Eojun Park, Ho-Chang Jung, Advanced Powertrain R&amp;D Department, Korea Automotive Technology Institute, South Korea</p>
12	<p><b>2023002140 Efficiency Improvement of SPMSG in the Engine-Generator System of a PHEV Shown to be Compatible with an Optimal Operating Line</b> Ho-Chang Jung, Advanced Powertrain R&amp;D Center, Korea Automotive Technology Institute, South Korea; Deokjin Kim, Advanced Powertrain R&amp;D Center, Korea Automotive Technology Institute, South Korea; Dongsu Lee, Electrical department, Hinetics LLC, South Korea</p>
13	<p><b>2023001935 Flexible Voltage Support Control of Three-phase Four-leg Inverter with Active and Reactive Power Oscillation Optimization under Typical Double-line-to-ground Faults</b> Xintong Liu, Zhao Liu, Xueyi Wu, Kaijie Wang, School of Automation, Nanjing University of Science and Technology, China</p>
14	<p><b>2023002519 Design of Hairpin Winding and Random Winding Stators for High Speed Heavy-Duty Traction Motor</b> Jianan Jiang, School of Automation, Northwestern Polytechnical University, China; Faculty of Engineering, University Nottingham, United Kingdom; Tianjie Zou, Antonino La Rocca, Salvatore La Rocca, Chuan Liu, David Gerada, Zeyuan Xu, Chris Gerada, Faculty of Engineering, University of Nottingham, United Kingdom</p>
15	<p><b>2023001972 An Accumulative Method to Time Series Prediction for Vehicle Communication</b> Vivekanandh Elangovan, Weidong Xiang, Sheng Liu, Electrical and Computer Engineering, University of Michigan - Dearborn, United States</p>

- 16 2023002211 **Vehicle State Estimation through Modular Factor Graph-based Fusion of Multiple Sensors**  
Pragyan Dahal, Jai Prakash, Stefano Arrigoni, Francesco Braghin, Department of Mechanical Engineering, Politecnico Di Milano, Italy
- 17 2023002014 **A Data-driven Energy Management Strategy for Series Hybrid Electric Tracked Vehicle based on Power Coordinated Control**  
Qicong Su, Ruchen Huang, Hongwen He, Zegong Niu, Zhiqiang Zhou, National Engineering Research Center for Electric Vehicles, Beijing Institute of Technology, China; Xuefeng Han, China North Vehicle Research Institute, China North Vehicle Research Institute, China
- 18 2023001955 **Energy management strategy based on an improved TD3 reinforcement algorithm with novel experience replay**  
Zegong Niu, Ruchen Huang, Hongwen He, Zhiqiang Zhou, Qicong Su, School of mechanical engineering, Beijing Institute of Technology, China
- 19 2023002043 **Predictive Energy Consumption Reduction for EV Adaptive Cruise Controllers with Uncertain Speed Information**  
Shahriar Shahram, Yaser Pourmohammadi Fallah, Electrical and Computer Engineering, University of Central Florida, United States
- 20 2023002030 **Guided Eco-driving of Fuel Cell Hybrid Electric Vehicles via Model Predictive Control**  
Bo Liu, Chao Sun, Xiaodong Wei, Da Wen, Changjiu Ning, Haoyu Li, School of Mechanical Engineering, Beijing Institute of Technology, China
- 21 2023001934 **Simulation of a novel approach for particulate filter heating of hybrid powertrains with model-in-loop**  
Osman Yolbulan, Recep Cocuk, Bugra Cengiz, Oytun Karaduman, Kerem Tokdemir, Kaan Celik, Calibration, AVL Research & Development Turkey, Turkey; Calibration, AVL Research & Development Turkey, Turkey
- 22 2023002197 **Travel Motif-Based Learning Scheme for Electric Vehicle Charging Demand Forecasting**  
Mamunur Rashid, Tarek Elfouly, Nan Chen, Electrical and Computer Engineering, Tennessee Tech University, United States
- 23 2023002010 **Intelligent Energy Management for Fuel Cell Bus Based on Enhanced Soft Actor-Critic Algorithm**  
Ruchen Huang, Zegong Niu, Qicong Su, Hongwen He, Zheng Zhou, Zhiqiang Zhou, National Engineering Laboratory for Electric Vehicles, Beijing Institute of Technology, China
- 24 2023002019 **A Multi-Criteria Analysis of High Speed Rail System in Canada**  
Kshitij Saxena, Transit and Rail, KS Consulting, United States; Atul Manmohan, Transit and Rail, WSP Canada Inc, Canada
- 25 2023002004 **A Reactive Power Optimization Method for AC Metro Power Supply System Based on Particle Swarm Optimization Algorithm**  
Feng Ding, Haiqi Zhou, Sheng Lin, School of Electrical Engineering, Southwest Jiaotong University, China
- 26 2023002048 **Energy evaluation of PV and ESS integrated AC railways for suburban trains**  
Nuttaka Chinomi, Lin Jiang, Department of Electrical Engineering and Electronics, University of Liverpool, United Kingdom; Zhongbei Tian, Department of Electronic, Electrical and Systems Engineering, University of Birmingham, United Kingdom; Nakaret Kano, Department of Electrical Engineering, Khon Kaen University, Thailand
- 27 2023002018 **Ensuring Customer Satisfaction on long distance train journeys: An Indian Railways Case Study**  
Kshitij Saxena, Transit and Rail, KS Consulting, United States
- 28 2023002063 **Research on Model Predictive Control Method of Heavy-Haul Trains Based on Multi-Point Model**  
Yong Liu, Jie Yi, Zhengfang Zhang, Fan Jiang, Jinglei Bai, Yuan Luo, CRRC Times Electric, CRRC Zhuzhou Electric Locomotive Research Institute, China
- 29 2023002261 **On the Integration of On-Route Fast Chargers for Battery Electric Buses**  
Shady El-Batawy, Hajo Ribberink, Natural Resources Canada, Canmet ENERGY Ottawa, Canada; Raed Abdullah, Electric Utility Distribution Engineer, Canada
- 30 2023002164 **An Accurate MTPA Control for IPMSM Considering Variations of Motor Parameters and Temperatures**

Thien-Phuoc Nguyen, Department of Engineering Sciences, University of Adger, Norway; Thanh-Anh Huynh, Electrical Engineering, National Cheng Kung University, Taiwan; Chin-Wei Chang, System and Naval Mechatronic Engineering, National Cheng Kung University, Taiwan; Min-Fu Hsieh, Electrical Engineering, National Cheng Kung University, Taiwan

31 2023001958 **Seasonal effects on EV charging performance and power consumption under real traffic conditions: a case study in Umbria Region, Italy**

Elisa Belloni, Vittorio Bertolini, Antonio Faba, Riccardo Scorretti, Enrico Raschi, Ermanno Cardelli, Department of Engineering, University of Perugia, Italy



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