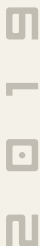


# AUTO MOTIVE

Torino 2-4, July 2019

Politecnico di Torino,  
sede del Lingotto



## International Conference of Electrical and Electronic Technologies for Automotive

Programme

Organized by

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# PROGRAMME OVERVIEW

## TUESDAY JULY 2

	AUDITORIUM	ROOM B	ROOM C
09,30-10,15	Opening Session		
10,15-11,00	Keynote Speech 1		
11,00-11,30	BREAK		
11,30-13,00	Technical Session 1 Recent Advances for e-mobility	Technical Session 2 Power Electronics I	
13,00-14,30	LUNCH		
14,30-15,00	Keynote Speech 2		
15,00-16,30	Technical Session 3 Power Electronics II	Technical Session 4 Wireless Charging	
16,30-17,00	BREAK		
17,00-18,30	Panel Session 1 Range Extension of Vehicles for e-mobility: the Impact of the Emerging Technologies and Components on the Electric Ecosystem		

## WEDNESDAY JULY 3

	AUDITORIUM	ROOM B	ROOM C
08,45-09,30	Keynote Speech 3		
09,30-13,00	Photonics4Automotive Workshop		
09,30-11,00		Technical Session 5 Advanced Driver Assistance Systems I	Tutorial SiC a key enabling technology for disruptive changes in e-mobility applications
11,00-11,30	BREAK		
11,30-13,00		Technical Session 6 Advanced Driver Assistance Systems II	
13,00-14,00	LUNCH		
11,30-13,00	Keynote Speech 4		
15,00-16,30	Technical Session 7 Mobility, Smart Cities and Networks	Technical Session 8 Photonics, Laser manufacturing, Car Lighting	
16,30-17,00	BREAK		
17,00-18,30	Panel Session 2 The new dimensions of Automotive - connected car, autonomous driving, smart urban mobility		
20,30-22,30	CONFERENCE DINNER		

## THURSDAY JULY 4

	AUDITORIUM	ROOM B	ROOM C
08,45-09,30	Keynote Speech 5		
09,30-11,00	Technical Session 9 Powertrain	Technical Session 10 Energy Infrastructure and Battery	
11,00-11,30	BREAK		
11,30-12,15	Keynote Speech 6		
12,15-13,00	Keynote Speech 7		
13,00-13,30	Conference Closure		

# OVERVIEW

## **AEIT AUTOMOTIVE 2019**

Conference, after 3 successful editions, will be held on July 2/4 2019 to host regular papers in several areas of the multiform automotive field.

The 4<sup>th</sup> AEIT International Conference of Electrical and Electronic Technologies for Automotive (AEIT AUTOMOTIVE 2019) aims to be a solid reference of the technical community to present and discuss the most recent results of scientific and technological research for the automotive industry, with particular emphasis to applications and new trends.

The Conference covers all aspects of the segment focusing on electrical vehicles, connected autonomous cars and related mobility.

## **AEIT AUTOMOTIVE 2019**

will bring together in an annual event, spread over 3 days, the Electrical and Electronic Automotive specialists with the Information and Communication Technology ones.

The Steering and the Technical Program Committees include experts from the Academic world, Associations, Key Industrial Stakeholders and Regulatory Authorities.

## **AEIT AUTOMOTIVE 2019**

will be structured in 3 days with Scientific Sessions, including both lectures and poster sessions, Key-note Speeches, Round tables and Panel discussions, covering current electric automotive scenario with its national and international perspectives, development trends and the regulatory framework.

## EXECUTIVE COMMITTEE

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# SCIENTIFIC SESSION TRACK CHAIRS

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## TRACK 2

Federico Baronti, *Italy* • Alfonso Damiano, *Italy* • Pierluigi Siano, *Italy*

## TRACK 3

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## TRACK 4

Giambattista Grusso, *Italy* • Lucia Lo Bello, *Italy* • Pierpaolo Marchese, *Italy* • Stefano Massucco, *Italy* • Domenico Villacci, *Italy*

## TRACK 5

Giuseppe Gattavari, *Italy* • Salvatore Musumeci, *Italy* • Roberto Petrella, *Italy*

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Carlo Cecati • *Italy*  
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Roberto Bacci • *Italy*  
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Maurizio Ferrara • *Italy*

Gaspare Galati • *Italy*  
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## REGISTRATION FEES

AEIT Member, IEEE or IMAPS Member	Euro <b>500,00</b>
AEIT Young Member, IEEE Student Member	Euro <b>280,00</b>
Student AEIT Member/Non Member Non Author	Euro <b>60,00</b>
Non Member	Euro <b>550,00</b>
Non Member (< 32 years old)	Euro <b>315,00</b>
• Additional Paper Fee (up to one) AEIT/IEEE/IMAPS Member and Non Member	Euro <b>250,00</b>
• Single Day Fee AEIT Member, IEEE and IMAPS Member	Euro <b>220,00</b>
• Single Day Fee Non Member	Euro <b>240,00</b>
• Conference Dinner (July 3, 2019)	Euro <b>50,00</b>

## ON SITE SECRETARIAT

The Conference Secretariat will be open on site as follows

Tuesday, July 2 2019	8,00 • 18,30
Wednesday, July 3 2019	8,15 • 18,30
Thursday, July 4 2019	8,15 • 13,30

## TECHNICAL EXHIBITION

The Technical Exhibition will be open as follows

Tuesday, July 2 2019	11,00 • 18,30
Wednesday, July 3 2019	8,45 • 18,30
Thursday, July 4 2019	8,45 • 13,30

## CONFERENCE DINNER

On the evening of July 3, at the end of the second day of the AUTOMOTIVE conference, the conference dinner will be held at the Il Circolo Restaurant - Unione Industriale Torino at 20.30 - Via V. Vela, 15 Torino.

## SECRETARIAT

AEIT • Ufficio Centrale

Via Mauro Macchi, 32 20124 Milano, Italy • Tel. +39 02 87389965

email: [automotive@aeit.it](mailto:automotive@aeit.it)

web site: <https://convegni.aeit.it/automotive>

## VENUE

Politecnico di Torino • Lingotto

Via Nizza, 230 • 10126 Torino • Italy

# Technical Programme

**TUESDAY, JULY 2, 2019**

**9,30 - 10,15 Opening Session**

**AUDITORIUM**

*Chair: Angelo Raciti • Chair AEIT Automotive 2019*

*Debora Stefani • Presidente Generale AEIT*

*Patrizia Lombardi • Prorettrice Politecnico di Torino*

*Andrea Tronzano • Assessore Bilancio, Finanze, Programmazione economico-finanziaria, Patrimonio, Sviluppo delle attività produttive - Regione Piemonte*

*Paola Pisano • Assessore all'innovazione - Comune di Torino*

*Dario Gallina • Presidente Unione Industriale Torino*

*Vincenzo Ilotte • Presidente Camera di Commercio di Torino*

*Alessio Toneguzzo • Presidente Ordine degli Ingegneri della Provincia di Torino*

*Renato Oscar Valentini • Presidente Federmanager Torino*

**10,15 - 11,00 Keynote Speech 1**

*Chair: Antonio Imbruglia - AEIT-AMES, Italy*

*• Trends in EV charging research*

*Pavol Bauer • Delft University of Technology, The Netherlands*

**11,00 - 11,30 Coffee Break**

**11,30 - 13,00 TECHNICAL SESSION 1**

**AUDITORIUM**

*• Recent Advances for e-mobility*

*Chairs: Vittorio Cecconi - AEIT-ASTRI, Italy • Giuseppe Schettino - Università di Palermo, Italy*

**1.1 State of Health Estimation of Lithium Batteries for Automotive Applications with Artificial Neural Networks** • Angelo Bonfitto, Stefano Ferraco, Ethelbert Ezemobi, Andrea Tonoli, Nicola Amati, Shailesh Hegde - *Politecnico di Torino, Italy*

**1.2 A portable system for multiple parameters monitoring: towards assessment of health conditions and stress level in the automotive field** • Riccardo Pernice, Antonino Parisi, Gabriele Adamo, Saverio Guarino, Luca Faes, Alessandro Busacca - *Università di Palermo, Italy*

**1.3 Tuning of Extended Kalman Filters for Sensorless Motion Control with Induction Motor** • Francesco Alonge, Filippo D'Ippolito, Adriano Fagiolini, Giovanni Garraffa, Francesco Maria Raimondi, Antonino Sferlazza - *Università di Palermo, Italy*

**1.4 Enhanced hotplug protection in BMS applications. Part I: Theoretical Aspects and Practical Issues** • Vittorio D'Angelo, Salvatore Cannavacciuolo,



Sergio Lecce, Valerio Bendotti, Orazio Pennisi - *STMicroelectronics, Italy*

**1.5 Enhanced hotplug protection in BMS applications. Part II: Enhanced Solution Development** • Vittorio D'Angelo, Salvatore Cannavacciuolo, Sergio Lecce, Valerio Bendotti, Orazio Pennisi - *STMicroelectronics, Italy*

**1.6 A Reduced Switch Multiport Converter Drive for Solar-assisted SRM EV** • Jose Thankachan, Sajjan Pal Singh - *I. I. T. Roorkee, India*

**1.7 E-mobility: Safety, Service Continuity and Penetration of Charging Systems** • Giuseppe Mauromicale, Angelo Raciti, Santi Agatino Rizzo, Giovanni Susinni - *Università di Catania, Italy* • Giuseppe Parise, Luigi Parise - *Sapienza Università di Roma, Italy*

## 11,30-13,00 TECHNICAL SESSION 2

## ROOM B

### • Power Electronics I

*Chairs:* Giuseppe Gattavari - *AEIT-AMES, Italy* • Salvatore Musumeci - *Politecnico di Torino, Italy*

**2.1 WInSiC4AP: Wide band gap Innovative SiC for Advanced Power** • Antonio Imbruglia, Mario Saggio, Salvatore Cascino, Agatino Minotti, Marco Renna, Giuseppe Gullotta, Antonio Lionetto - *STMicroelectronics, Italy* • Jacques Favre - *aPSI3D SAS, France* • Fabrizio Roccaforte, Patrick Fiorenza - *CNR-IMM, Italy* • Leoluca Liggio, Salvatore Frisella - *Distretto Tecnologico Sicilia Micro e Nano Sistemi, Italy*

**2.2 Improvement of SiC power module layout to mitigate the gate-source overvoltage during switching operation** • Giuseppe Mauromicale, Angelo Raciti, Santi Agatino Rizzo, Giovanni Susinni - *Università di Catania, Italy* • Luigi Abbatelli, Simone Buonomo, Vittorio Giuffrida, Alessandra Raffa - *STMicroelectronics, Italy*

**2.3 A 9-level three-phase multilevel converter with harmonic mitigation and battery balancing** • Rosario Miceli, Vincenzo Castiglia, Guido Ala - *Università di Palermo, Italy* • Carlo Cecati, M. Gabriella Cimatori, Concettina Buccella - *Università de L'Aquila, Italy*

**2.4 Fast DC-Type Electric Vehicle Charger Based on a Quasi-Direct Boost - Buck Rectifier** • Thiago Batista Soeiro, Pavol Bauer - *Delft University of Technology, The Netherlands*

**2.5 Smart Power devices and new electronic fuses compliant with new E/E architecture for autonomous driving** • Romeo Letor, Roberto Crisafulli - *STMicroelectronics, Italy*

**2.6 SiC MOSFETs as Enabler for the future ePowertrain and its behaviour under Short Circuit Condition** • Manuel Gaertner - *STMicroelectronics, Germany* • Daniela Cavallaro, Mario Pulvirenti, Edoardo Zanetti, Mario Saggio, Maurizio Ferrara - *STMicroelectronics, Italy*

13,00-14,30 **Lunch**

**14,30-15.00 Keynote Speech 2**

**AUDITORIUM**

*Chair:* Giuseppe Gattavari • AEIT-AMES, Italy

• **Wide Bandgap Power Devices**

Salvatore Coffa • STMicroelectronics, Italy

**15,00-16,30 TECHNICAL SESSION 3**

**AUDITORIUM**

• **Power Electronics II**

*Chairs:* Massimiliano Merisio - STMicroelectronics, Italy • Roberto Petrella - Università di Udine, Italy

**3.1 Three-Phase DC-Type Electric Vehicle Charger Featuring Zero Voltage Switching** • Thiago Batista Soeiro, Pavol Bauer - Delft University of Technology, The Netherlands

**3.2 Overview of traction converters topologies for Zero Emissions Vehicles** • Adolfo Dannier, Andrea Del Pizzo - Università di Napoli Federico II, Italy • Marino Coppola - PNP Lab, Italy

**3.3 Automotive Electrification: A Reinforced Matrix Solder Solution for Increased Reliability for Substrate to Baseplate Attach** • Karthik Vijay - Indium Corporation, United Kingdom

**3.4 Maximum Power Point Tracking Control Based on Modified ABC Algorithm for Shaded PV System** • Nie Li, Mingxuan Mao, Yihao Wan, Lichuang Cui, Lin Zhou, Zhang Qianjin - Chongqing University, P.R. China

**3.5 Low Voltage High Current Trench-Gate MOSFET Inverter for Belt Starter Generator Applications** • Salvatore Musumeci, Radu Bojoi - Politecnico di Torino, Italy • Filippo Scrimizzi, Giuseppe Longo, Filadelfo Fusillo, Carmelo Mistretta - STMicroelectronics, Italy

**3.6 Wireless Power Transfer System Stability Analysis for E-Bikes Application** • Federico Genco, Michela Longo - Politecnico di Milano, Italy • Patrizia Livreri - Università di Palermo, Italy • Alicia Triviño - University of Malaga, Spain

**15,00-16,30 TECHNICAL SESSION 4**

**ROOM B**

• **Wireless Charging**

*Chairs:* Juan Villa - University of Zaragoza, Spain • Vincenzo Cirimele - Politecnico di Torino, Italy

**4.1 Metrology for Inductive Charging of Electric Vehicles (MICEV)**

• Mauro Zucca, Oriano Bottauscio - INRIM, Italy • Stuart Harmon, Roberta Guilizzoni - NPL, National Physical Laboratory, United Kingdom • Florian Schilling, Matthias Schmidt - Physikalisch Technische Bundesanstalt, Germany • Peter Ankarson, Tobias Bergsten - RISE, Sweden

- Kari Tammi, Panu Sainio - *Aalto University, Finland* • Jorge Bruna, Erika Laporta - *CIRCE-Universidad de Zaragoza, Spain* • Lionel Pichon - *Laboratoire Génie électrique et électronique de Paris - GeePs, France* • Fabio Freschi, Vincenzo Cirimele - *Politecnico di Torino, Italy* • Pavol Bauer, Jianning Dong - *Delft University of Technology, The Netherlands* • Antonio Maffucci, Salvatore Ventre - *Università di Cassino e del Lazio Meridionale, Italy* • Nicola Femia, Giulia Di Capua - *Università di Salerno, Italy* • Niels Kuster, Ilaria Liorni - *Schmid & Partner Engineering AG-SPEAG, Switzerland*

#### **4.2 Design considerations for WPT Dynamic charging applications**

- Juan L. Villa, José F. Sanz - *University of Zaragoza, Spain* • Rubén Ace-rete, Juan Perié - *Research Institute CIRCE, Spain*

#### **4.3 Reducing the Electromagnetic Fields in Dynamic Inductive Charging of Electric Vehicles** • Ioannis Karakitsios, Nikos Hatziaargyriou - *National Technical University of Athens, Greece*

#### **4.4 Characterization of the Emission of an Electric Bus Inductive Charging in the 2 kHz to 150 kHz Range** • Stefano Lodetti, Jorge Bruna - *Fundación CIRCE, Spain* • José F. Sanz, Julio J. Melero - *Instituto Universitario de Investigación CIRCE (Universidad de Zaragoza - Fundación CIRCE), Spain*

#### **4.5 Survey on Standards and Regulations for Wireless Charging of Electric Vehicles** • Francesca Grazian, Wenli Shi, Jianning Dong, Peter J. van Duijsen, Thiago Batista Soeiro, Pavol Bauer - *Delft University of Technology, The Netherlands*

#### **4.6 A Hybrid Topology Wireless Power Transfer System with Constant Current or Constant Voltage Output for Battery Charging Application** • Mojtaba Khalilian, Paolo Guglielmi - *Politecnico di Torino, Italy*

#### **4.7 Uncertainty Quantification in the Assessment of Human Exposure near Wireless Power Transfer Systems in Automotive Applications**

- Paul Lagouanelle, Van-Lang Krauth, Lionel Pichon - *Laboratoire Génie électrique et électronique de Paris - GeePs, France*

#### **4.8 Towards an IoT-enabled Wireless Charging Metering Service for Electrical Vehicles** • Ahmad Kobeissi - *Università di Genova, Italy & Lebanese University, Lebanon* • Francesco Bellotti, Riccardo Berta, Alessandro De Gloria - *Università di Genova, Italy*

**16,30 - 17,00 Coffee Break**

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**WEDNESDAY, JULY 3, 2019****8,45 - 9,30 Keynote Speech 3****AUDITORIUM***Chair:* Filippo Di Giovanni - *STMicroelectronics, Italy*• **World Class Manufacturing: gateway for industry innovation**Alessandro Leverano • *FCA, Italy***09,30-13,00****AUDITORIUM**• **Photonics4Automotive Workshop****09,30-11,00 TECHNICAL SESSION 5****ROOM B**• **Advanced Driver Assistance Systems I***Chairs:* Martin Duncan - *STMicroelectronics, Italy* • Francesco Braghin - *Politecnico di Milano, Italy***5.1 Vehicle state estimation based on Kalman filters** • Mattia Bersani, Michele Vignati, Simone Mentasti, Stefano Arrigoni, Federico Cheli • *Politecnico di Milano, Italy***5.2 Simultaneous Odometry, Mapping and Object Tracking with a Compact Automotive Radar** • Luigi Arnone, Paolo Vicari - *STMicroelectronics, Italy***5.3 Connected Transports, V2X and 5G: Standard, Services and the TIM - Telecom Italia Experiences** • Gabriele Elia, Manuela Bargis, Maria-pia Galante, Nicola Pio Magnani, Lorenzo Santilli, Giovanni Romano, Gianluca Zaffiro - *TIM - Telecom Italia, Italy***5.4 Connected cars under the GDPR** • Raffaele Zallone - *Studio Legale Zallone, Italy***5.5 Multi-layer occupancy grid mapping for autonomous vehicles navigation** • Simone Mentasti, Matteo Matteucci - *Politecnico di Milano, Italy***5.6 A MEC-based Extended Virtual Sensing for Automotive Services** • Giuseppe Avino - *Politecnico di Torino, Italy* • Marina Giordanino - *CRF-FCA, Italy*• Pantelis A. Frangoudis - *Eurecom, France* • Christian Vitale, Claudio E. Casetti, Carla Fabiana Chiasserini, Kalkidan Gebru - *Politecnico di Torino, Italy*• Adlen Ksentini - *Eurecom, France* • Aleksandra Stojanovic - *CRF-FCA, Italy***5.7 Eritrea Mobility and Cultural Heritage: New Frontiers of the Horn of Africa** • Federico Cheli, Susanna Bortolotto, Emanuele Zappa, Francesco Ferrise, Edoardo Sabbioni, Francesco Augelli, Monica Papini, Matteo Colombo, Michela Longo - *Politecnico di Milano, Italy***09,30-11,00 TUTORIAL****ROOM C**• **SiC: a key enabling technology for disruptive changes in e-Mobility applications** • Filippo Di Giovanni • *STMicroelectronics, Italy***11,00-11,30 Coffee Break**

### 11,30-13,00 TECHNICAL SESSION 6

ROOM B

#### • Advanced Driver Assistance Systems II

*Chairs:* Romeo Giuliano - *Università Guglielmo Marconi, Italy* • Andrea Penza - *AEIT-AICT Society, Italy*

#### 6.1 Automated Driving Systems: Key Advantages, Limitations and Risks

• Alberto Bocca, Donkyu Baek - *Politecnico di Torino, Italy*

6.2 A Robust Adaptive System for Active Noise Control of Impulsive Noise • Ayesha Zeb, Alina Mirza - *National University of Sciences and Technology, Pakistan*

6.3 Driving Behavior Classification Using Long Short Term Memory Networks • Mehmet Emin Mumcuoglu, Gokhan Alcan, Mustafa Unel - *Sabanci University, Turkey* • Onur Cicek, Mehmet Mutluergil, Metin Yilmaz, Kerem Koprubasi - *Ford Otosan, Turkey*

6.4 A new optimal control of obstacle avoidance for safer autonomous driving • Gianluca Pepe, Maicol Laurenza, Dario Antonelli, Antonio Carcaterra - *Sapienza Università di Roma, Italy*

6.5 Remote PhotoPlethysmoGraphy Using SPAD Camera for Automotive Health Monitoring Application • Marco Paracchini, Lorenzo Marchesi, Klaus Pasquinelli, Marco Marcon, Giulio Fontana, Alessandro Gabrielli, Federica Villa - *Politecnico di Milano, Italy*

6.6 Non-linear MPC motion planner for autonomous vehicles based on Accelerated Particle Swarm Optimization algorithm • Stefano Arrigoni, Edoardo Trabalzini, Mattia Bersani, Francesco Braghin, Federico Cheli - *Politecnico di Milano, Italy*

6.7 A prototypical Implementation of an ISO-15118-Based Wireless Vehicle to Grid Communication over Decoupled Technologies • Nadim El Sayed - *Technische Universitaet Berlin, Germany*

6.8 Power flow numerical Simulation of Organic Solar Cells with gold thin film driving • Grazia Lo Sciuto, Giacomo Capizzi - *Università di Catania, Italy*, Dor Gotleyb, Rafi Shikler - *Ben-Gurion University of the Negev, Israel*

### 13,00-14,30 Lunch

### 14,30-15,00 Keynote Speech 4

AUDITORIUM

*Chair:* Nadim El Sayed - *TUB Berlin, Germany*

• Photonic technologies for smart vehicles interconnected at the speed of light  
Vittorio Curri - *Politecnico di Torino, Italy*

### 15,00-16,30 TECHNICAL SESSION 7

AUDITORIUM

#### • Mobility, Smart Cities and Networks

*Chairs:* Pierpaolo Marchese - *Consultant, Italy* • Gaetano Patti - *Università di Catania, Italy*

**7.1 Evaluating Real-Time-Location Solar Irradiance Data Against SO-LARGIS Ground Station Solar Irradiance for the South African Sasol Solar Challenge** • Gareth Gericke, Nicolaas Johannes Luwes - *Central University of Technology, South Africa*

**7.2 IEEE 802.11p under congestion in an Infrastructure-to-Vehicle communication approach** • Martin Klapez, Carlo Augusto Grazia, Luca Rold, Maurizio Casoni - *Università di Modena e Reggio Emilia, Italy*

**7.3 Performance of LoRa for Bike-Sharing Systems** • Daniele Croce, Domenico Garlisi, Fabrizio Giuliano, Alice Lo Valvo, Stefano Mangione, Ilenia Tinnirello - *Università di Palermo, Italy*

**7.4 Implementation of a MEC-based Vulnerable Road User Warning System** • Antonia Napolitano - *TIM, Italy* • Gabriele Cecchetti, Francesco Giannone, Anna Lina Ruscelli, Federico Civerchia, Koteswararao Kondempu, Luca Valcarengi, Piero Castoldi - *Scuola Superiore Sant'Anna, Italy*

**7.5 Evaluation of the future impact of electro-mobility on the distribution network of South Tyrol** • Chiara Michelangeli, Giacomo Viganò, Diana Moneta - *Ricerca sul Sistema Energetico-RSE, Italy* • Luis Amort, Marco Birello, Alberto Bridi, Bruno Fasoli, Arnold Rofner - *Edyna, Italy* • Giovanni Paolucci, Dieter Theiner - *Alperia, Italy*

**7.6 Smart Mobility: new roles for Telcos in the emergence of electric and autonomous vehicles** • Gianluca Zaffiro, Giuseppe Marone - *TIM - Telecom Italia, Italy*

**7.7 A Middleware to Develop and Test Vehicular Sensor Network Applications** • Salvatore Gaglio, Giuseppe Lo Re, Gloria Martorella, Daniele Peri - *Università di Palermo, Italy*

**7.8 Performance assessment of the IEEE 802.1Q in automotive applications** • Gaetano Patti, Lucia Lo Bello - *Università di Catania, Italy*

## 15,00-16,30 TECHNICAL SESSION 8

## ROOM B

• Photonics, Laser manufacturing, Car Lighting

*Chairs:* Daniel Milanese - *Università di Parma e Reggio Emilia, Italy*

• Vittorio Curri - *Politecnico di Torino, Italy*

**8.1 CAN-FD Light - A novel communication bus supporting digitalization and customization of automotive lighting for the broad market** • Donato Tagliavia, Marianna Sanzà - *STMicroelectronics, Italy* • Fred Renig, Jochen Barthel - *STMicroelectronics, Germany*

**8.2 Monitoring gasoline direct injectors for engine performance and emission control** • Stefano Faralli, Fabrizio Gambini, Lorenzo Tozzetti, Fabrizio Di Pasquale - *Scuola Superiore Sant'Anna, Italy* • Ivano Izzo, Tommaso Barsanti, Luca Matteucci - *CPT Italy, Italy*

**8.3 Yb-Er phosphate glass optical amplifiers for eye-safe compact LIDARs - the "Caliber" project** • Nadia Boetti - *Links Foundation, Italy* • Diego Pugliese, Duccio Gallichi-Nottiani, Davide Janner, Daniel Milanese - *Politecnico di Torino, Italy*

**8.4 A New Digital Flow for Automotive Robust Design of DC-DC Converters** • Sandro Dalle Feste, Alessandro Bertolini, Francesco Bruni, Alessia Cagidiaco, Marco Castellano, Luca Gandolfi, Alessandro Gasparini, Marco Leo, Domenico Tripodi - *STMicroelectronics, Italy*

**8.5 Additive Manufacturing: scenario, approach and competence in FCA** • Roberta Sampieri - *FCA Italy, Italy*

**8.6 Competence Manufacturing Industry 4.0 (CIM4.0) and Integrated Additive Manufacturing (IAM) center of Politecnico di Torino: current status and perspectives** • Paolo Fino - *Politecnico di Torino & IIT, Italy* • Mariangela Lombardi - *Politecnico di Torino, Italy*

**8.7 Laser-based manufacturing technologies in automotive: cutting, welding, additive manufacturing** • Giuseppe Virgillito - *Prima Industrie, Italy*

**8.8 A photonic bus for automotive power applications** • Paolo Savio - *LINKS Foundation, Italy* • Anantaram Varatharajan, Sherif Abdelfattah, Gianmario Pellegrino - *Politecnico di Torino, Italy* • Silvio Abrate - *LINKS Foundation, Italy* • Vittorio Curri - *Politecnico di Torino, Italy*

**16,30-17,00 Coffee break**

**17,00-18,30 PANEL SESSION 2**

**AUDITORIUM**

• The new dimensions of Automotive - connected car, autonomous driving, smart urban mobility

**Chair:** Andrea Penza - *AEIT-AICT Society, Italy*

**Panelists**

Luisa Andreone - *FCA, Italy*

Fabrizio Arneodo - *5T, Italy*

Gianfranco Burzio - *CEI Piemonte, Italy*

Martin Duncan - *STMicroelectronics, Italy*

Gabriele Elia - *TIM, Italy*

Leonardo Gomes Baltar - *Intel, Germany*

Giorgio Pizzi - *USTIF Roma, Italy*

Raffaele Veneruso - *Comoli Ferrari, Italy*

Raffaele Zallone - *Studio Zallone, Italy*

**20,30-22,30 Conference Dinner**



# THURSDAY, JULY 4, 2019

**8,45 - 9,30** *Keynote Speech 5*

**AUDITORIUM**

*Chair:* Martin Duncan - *STMicroelectronics, Italy*

- Trends in Connected Car: a glance into state of the art and future challenges

Antonio Buttiglieri • *Italdesign, Italy*

**09,30-11,00** **TECHNICAL SESSION 9**

**AUDITORIUM**

- Powertrain

*Chairs:* Davide Tarsitano - *Politecnico di Milano, Italy* • Vito Giuseppe Monopoli - *Politecnico di Bari, Italy*

**9.1** Photovoltaic Cover Material for a Solar Challenger Vehicle with Solar Tracking, Evaluation and Evaluation Instrument • Jacobus Faber, Nicolaas Johannes Luwes - *Central University of Technology, South Africa*

**9.2** Comparing Parallel Hybrid Electric Vehicle Powertrains for Real-world Driving • Pier Giuseppe Anselma, Giovanni Belingardi, Alessandro Falai, Claudio Maino, Federico Miretti, Daniela Misul, Ezio Spessa - *Politecnico di Torino, Italy*

**9.3** Simulation and experimental validation of a hybrid forklift truck • Jiajing Li, Giovanni Lutzenberger, Davide Poli, Claudio Scarpelli - *Università di Pisa* • Tommaso Piazza - *Toyota Material Handling Manufacturing Italy, Italy*

**9.4** Performance Comparison of Electrical Motors equipped with slightly Asymmetrical Windings • Massimo Caruso, Vittorio Cecconi, Antonino Oscar Di Tommaso, Rosario Miceli, Claudio Nevoloso - *Università di Palermo, Italy*

**9.5** A Review on Model Predictive Control and its Applications in Power Electronics • Simone Borreggine, Vito Giuseppe Monopoli - *Politecnico di Bari, Italy* • Gianluca Rizzello - *Saarland University, Germany* • David Naso, Francesco Cupertino, Rinaldo Consoletti - *Politecnico di Bari, Italy*

**9.6** Comparison of different scenarios of users distribution among charging infrastructure in an urban area • Natascia Andrenacci, Antonino Genovese - *ENEA, Italy*

**09,30-11,00** **TECHNICAL SESSIONS 10**

**ROOM B**

- Energy Infrastructure and Battery

*Chairs:* Gian Giuseppe Soma - *Università di Cagliari, Italy* • Stefania Conti - *Università di Catania, Italy*

**10.1** Multi-Objective Integrated Planning of Fast Charging Stations

- Gian Giuseppe Soma, Fabrizio Pilo - *Università di Cagliari, Italy* • Stefania Conti - *Università di Catania, Italy*

**10.2 Power Management of a Battery/Supercapacitor System for E-Mobility Applications** • Vincenzo Castiglia, Patrizia Livreri, Rosario Miceli - *Università di Palermo, Italy* • Filippo Pellitteri - *Sapienza Università di Roma, Italy* • Giuseppe Schettino, Fabio Viola - *Università di Palermo, Italy*

**10.3 Estimation of the Residual Energy in Battery Electric Vehicles** • Donkyu Baek, Yukai Chen, Alberto Bocca, Santa Di Cataldo - *Politecnico di Torino, Italy* • Naehyuck Chang - *KAIST, Korea*

**10.4 Electro-Thermal Aging Model of Li-Ion Batteries for Vehicle-to-Grid Services** • Marco Mauri, Francesco Castelli-Dezza, Maria Stefania Carmeli, Massimo Scarfogliero - *Politecnico di Milano, Italy* • Gabriele Marchegiani - *Engie EPS, Italy*

**10.5 Simplified Modeling and Characterization of the Internal Impedance of Lithium-Ion Batteries for Automotive Applications** • Santo Scavuzzo, Alessandro Ferraris, Andrea Airale, Massimiliana Carello - *Politecnico di Torino, Italy* • Edoardo Locorotondo, Luca Pugi, Lorenzo Berzi, Marco Pierini - *Università di Firenze, Italy*

**10.6 Virtual Energy Storage System Using Aggregated Electric Vehicles for Ancillary Services in Distribution Grid** • Emrul Hasan, Sonakshi Sharma, Morris Brenna - *Politecnico di Milano, Italy*

**10.7 Li-ion SOC Optimizer Consumption Using Accelerated Particle Swarm Optimization and Temperature Criterion** • Juan D. Valladolid, Juan P. Ortiz, Felipe A. Berrezueta, Gina P. Novillo - *Universidad Politécnica Salesiana, Ecuador*

**10.8 Thermal Management Optimization of a Passive BMS for Automotive Applications** • Umberto Abronzini, Ciro Attaianese, Matilde D'Arpino, Mauro Di Monaco, Francesco Porpora, Giuseppe Tomasso - *Università di Cassino e del Lazio Meridionale, Italy*

### **11,00-11,30 Coffee break**

#### **11,30-12,15 Keynote Speech 6**

**AUDITORIUM**

*Chair:* Vito Giuseppe Monopoli - *Politecnico di Bari, Italy*

• Highway to the future: how image processing and deep learning are changing the automotive industry  
Santa Di Cataldo • *Politecnico di Torino, Italy*

#### **12,15-13,00 Keynote Speech 7**

**AUDITORIUM**

• Power/Data Transmission for Highly Integrated Galvanically Isolated Systems  
Egidio Ragonese • *Università di Catania, Italy*

### **13,00-13,30 Conference Closure**

## Crediti Formativi

*Il convegno è stato organizzato con l'Ordine degli Ingegneri della Provincia di Torino e con il Collegio dei Periti Industriali e dei Periti Industriali Laureati di Alessandria, Asti, Torino.*

*La partecipazione al convegno consentirà, agli iscritti all'Ordine degli Ingegneri, l'acquisizione di CFP secondo i criteri stabiliti dalla normativa vigente.*

*Ai sensi dell'art.7, comma 3 del DPR 137/2012 e del Regolamento per la Formazione Continua dei Periti Industriali e Periti Industriali Laureati, la partecipazione all'evento consentirà l'acquisizione di CFP per la partecipazione.*

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