ISIE 2017

Conference Guide

26th IEEE International Symposium on Industrial Electronics

Edinburgh, UK, 19-21 June 2017

IEEE
Advancing Technology for Humanity

IES

IET The Institution of Engineering and Technology

Anglia Ruskin University

At a Glance - Conference Schedule

	Monday 19th June 2017		Tuesday 20th June 2017		Wednesday 21st June 2017	
AM			07:30 - 18:30	**Registration** *Strathblane Hall*		
			08:40 - 09:10	**Formal Opening** *Pentland Auditorium*	08:00 - 16:30	**Registration** *Strathblane Hall*
			09:10 - 09:50	**Prof. Joachim Holtz** *Pentland Auditorium*	09:00 - 09:40	**Dr. Akira Nakajima & Prof. Shankar Ekkanath Madathil** *Pentland Auditorium*
			09:50 - 10:30	**Dr. Andrei Dinu** *Pentland Auditorium*	09:40 - 10:20	**Dr. Domenico Vicinanza & Dr. Genevieve Williams** *Pentland Auditorium*
			10:30 - 10:50	**Coffee Break** *Strathblane Hall*	10:20 - 10:40	**Coffee Break** *Strathblane Hall*
			10:50 - 12:50	**Parallel Sessions** *Various*	10:40 - 12:40	**Parallel Sessions** *Various*
			12:50 - 13:50	**Lunch** *Strathblane Hall*	12:40 - 13:40	**Lunch** *Strathblane Hall*
PM	13:00 - 19:30	**Registration** *Strathblane Hall*	13:50 - 15:50	**Parallel Sessions** *Various*	13:40 - 15:40	**Parallel Sessions** *Various*
	14:00 - 16:30	**Tutorials** (inc Coffee Break) *Various*	15:50 - 16:10	**Coffee Break** *Strathblane Hall*	15:40 -16:00	**Closing Address** *Fintry Auditorium*
	17:00 - 18:20	**Industry Panel** *Pentland Auditorium*	16:10 - 18:10	**Parallel Sessions** *Various*	16:00-16:20	**Coffee Break** *Strathblane Hall*
	18:30 - 19:30	**Welcome Drinks Reception** *Strathblane Hall*	19:00 - 22:30	**Festive Dinner** *Cromdale Hall*		

Contents

Message from the ISIE 2017 General Co-Chairs

Professor Marcian Cirstea
Anglia Ruskin
University, UK

Professor John Hung
Auburn University, USA

Professor Xinghuo Yu
RMIT University, Australia

It is our pleasure and honour to welcome you to the 26th International Symposium on Industrial Electronics (ISIE), sponsored by IEEE Industrial Electronics Society and held in Edinburgh, Scotland, UK, between 19-21 June 2017. Industry experts, researchers and academics are expected to gather together to share ideas and experiences surrounding frontier technologies, breakthroughs, innovative solutions, research results, as well as initiatives related to industrial electronics and their applications.

ISIE 2017 offers you a conference with wonderful historic surroundings, interesting menus and well equipped rooms, to complement an interesting and attractive technical programme and keynote plenary sessions on current topics in industrial electronics.

We gratefully praise and acknowledge the hard work and dedication of the conference committees, including many officers and volunteers of the IEEE IES, as well as the invaluable contribution from the invited speakers, tutorial presenters, authors of papers, track chairs, special session chairs and paper reviewers, all of whom made this conference possible. We express our gratitude for their dedication and hard work.

We invite you to read through this brochure where you can learn more about our conference which we strongly hope you will enjoy. The Edinburgh International Conference Centre represents an exquisite host venue for our symposium, along with the beautiful city of Edinburgh in which it resides. This is a great opportunity to meet old friends and colleagues, find new ones and attend many high-quality technical activities as well as very enjoyable social ones.

Finally, many thanks for reading this message. It is clear that the success of our conference rests on the enthusiastic support and participation of committed colleagues like you. Thank you for supporting our symposium. We look forward to welcoming you to the beautiful city of Edinburgh and we shall do our best to make ISIE 2017 a remarkable and unforgettable event.

Welcome Address from the Technical Programme Co-Chairs

On behalf of the Technical Programme Committee, we welcome you to the 2017 International Symposium on Industrial Electronics. This conference is at its 26th edition and provides an international forum for expert discussions on the latest research and developments in industrial electronics and associated technologies.

The core themes of the conference, reflected in the 15 main technical tracks, are better known and will need little introduction to our delegates. These are complemented at this edition by 19 special sessions. These range from sessions on smart grids, power quality, fault diagnosis and energy technologies to machine vision, industrial automation and the internet of things, and also include sessions related to human support and healthcare applications. The range of special sessions bears witness to the exciting developments taking place in the industrial electronics technologies and, of course, to the future continuity of the Industrial Electronics Society's conferences.

Another feature of this conference is the offering of tutorials which are free to registered conference delegates. ISIE 2017 is pleased to offer seven tutorials, of which one includes a practical demonstration on smart open-source electronics. The other tutorials are concerned with topics covering the themes of battery management systems and chargers, power conversion and control as well as energy storage systems.

Whilst research is a fascinating subject in its own right, we must remember that the main aim of our activity is that of technology transfer, wealth creation and the benefiting of both present and future society. It is therefore appropriate that this is the theme touched upon collectively by the plenary sessions of the conference. An Industry Panel has been organized, covering the very current topics of Smart Cities and Connectivity, while the four keynote presentations of the symposium will cover:

- Predictive Current Control - When to use? (Prof. Joachim Holtz)
- Flying through a Solar Storm - The Radiation Challenge (Dr. Andrei Dinu)
- Recent Status in Polarization Super Junction Technologies in Gallium Nitride (Dr. Akira Nakajima and Prof. Shankar Madathil)
- Sound Engineering for Data Analysis and Exploration (Dr. Domenico Vicinanza and Dr. Genevieve Williams)

We very much hope that you find the technical programme enjoyable, stimulating and precipitous of discussion. On behalf of the Technical Programme Committee, we would like to thank you all for attending and supporting ISIE 2017 and helping to make it a success. We hope you have a fulfilling and enjoyable time in Edinburgh and will take away fond memories of both the conference and your stay in this remarkable, historic city.

Professor Luis Gomes
Universidade Nova
de Lisboa, Portugal

Professor Peter Palensky
Delft University
of Technology, Holland

Professor Kamal Al-Haddad
Ecole de Technologie
Superieure, Canada

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Xinghuo Yu (Australia)

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Peter Palensky (Holland)

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Thomas Strasser (Austria)

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Karl Davies (Anglia Ruskin Univ.)
David Binnie (Edinburgh Napier U.)
Silvia Cirstea (Anglia Ruskin Univ.)
Andrei Dinu (UTC Aerospace Syst.)
Manus Henry (Oxford Univ.)
Emil Levi (Liverpool JM Univ., UK)
Shankar Madathil (Sheffield Univ.)
Bucur Novac (Loughborough Univ.)
Alin Tisan (Anglia Ruskin Univ.)

Technical Track Co-Chairs

T1: Power Systems and Smart Grids
Josep Guerrero
Mo-Yuen Chow

T2: Electrical Machines and Industrial Drives
Andrea Cavagnino
Radu Bojoi
Chris Gerada
Sanjeet Dwivedi

T3: Control Systems and Applications
Shen Yin
Yasuharu Kunii
Qing-Long Han

T4: Power Electronics and Energy Conversion
Chandan Chakraborty
Remus Teodorescu
Mario Paolone

T5: Renewable Electric Energy Conversion, Processing and Storage
Ramon Blasco-Gimenez
Federico Baronti
Giovanni Spagnuolo

T6: Mechatronics and Robotics
Peter Korondi
Kiyoshi Ohishi
Seta Bogosyan

T7: Factory Automation and Industrial Informatics
Lucia Lo Bello
Paulo Leitao
Elizabeth Chang
Valeriy Vyatkin

T8: Electronic Systems-on-Chip & Embedded Systems
Marc Perron
Eric Monmasson
Ray Cheung

T9: Computational Intelligence. Image Processing
George Wilson
Milos Manic
Ian Van der Linde

T10: Sensors, Actuators and Micro-/ Nanotechnology
Stoyan Nihtianov
Antonio Luque
Toshiyuki Murakami
Ridha Ben Mrad

T11: Automotive Technology
Sheldon Williamson
Akshay Rathore
Fei Gao

T12: Building Automation, Control and Management
Jan Haase
Thomas Strasser
Joern Ploennigs
Gerhard Zucker

T13: Engineering Education
Joao Martins
Andreja Rojko

T14: Entrepreneurship and Management – Challenges for Industrial Electronics
Michael Condry
Robert Bierwolf

T15: Industrial Cyber-Physical Systems
Armando Colombo
Stamatis Karnouskos
Yang Shi

Student & Young Professionals (S-YP) Forum
Samir Kouro
Dimitri Vinnikov
Marek Jasinski

Special Session Organisers

SS-01: Machine Vision Control & Navigation
Oleg Sergiyenko
Julio C. Rodriguez-Quiñonez
Wendy Flores-Fuentes
Moises Rivas-Lopez

SS-02: Impedance Source Converters: Control, Improved Topologies and Emerging Applications
Yushan Liu
Haitham Abu-Rub

SS-03: Building Automation & IoT Applications for Energy Efficiency*
Gerhard Zucker
Jan Haase
Joern Ploennigs

SS-04: Advanced Power Electronics for Power Quality in Distributed Power Systems
Hadi Y. Kanaan
Kamal Al-Haddad
Hani Vahedi

SS-05: New Era of Smart Grids The Role of Smart Meters
João Martins
Mihai Sanduleac
Marco Liserre
Josep M. Guerrero

SS-06: Internet of Robots
Yasuharu Kunii
Gabor Sziebig
Mihoko Niitsuma

SS-07: New Era of Prosumers Operation Strategies Control Algorithms and Power Electronics
Dmitri Vinnikov
Enrique Romero-Cadaval
João Martins
Mariusz Malinowski

SS-08: Fault Diagnosis and Fault Tolerance in Power Electronics and Drives
Antonio J. Marques Cardoso
Chiara Boccaletti

SS-09: On-board Micro-grid for the More Electric Aircraft
Vito Giuseppe Monopoli
Giampaolo Buticchi
Marco Liserre

SS-10: Industrial Automation and Process System's Security
M. Soufian
N. Moradpoor
Zhiyuan Tan

SS-11: Efficient and Reliable Hybrid and Electric Propulsion Systems**
Antonio J. Marques Cardoso
Chiara Boccaletti

SS-12: Advances in Nonlinear Control for Power Generation
Gerasimos Rigatos
Pierluigi Siano
Sul Ademi

SS-13: Integrated Design of Sensing and Actuation for Human Support Applications
Seiichiro Katsura
Yasutaka Fujimoto
Toshiyuki Murakami
Kiyoshi Ohishi

SS-14: Signal and Power Automation Design for Communication Systems
Wael Dghais
Muhammad Alam
Kim Fung Tsang

SS-15: Control Algorithm and Converter Topologies for Energy Efficient Control of AC Drives
Sanjeet Dwivedi
Kaiyuan Lu
Shailendra Jain

SS-16: Modelling, Analysis, and Management of Hybrid Energy Storage Systems
Daniel T Gladwin
Alfonso Damiano
Federico Baronti

SS-17: Technology Design on Human Factors
Sho Yokota
Kanghyun Jo
Daisuke Chugo

SS-18: IoT Technology for Reliable User-Centric Sensing and Healthcare Applications
Alin Tisan
Jeannette Chin
G.P. Hancke

SS-19: Resilient Renewable Energy & Storage Systems
Yihua Hu
Chengbin Ma
Mo-Yuen Chow

SS-20: Flexible Electronics: Technologies and Applications
Shrawan Jha
Stuart Simpson

SS-21: Control and Management of Local Networks with Energy Storage
Cesar Silva
Lee Empringham
Edward Christopher
Liliana de Lillo

Notes

*Please note SS03 was merged in to T12
**Please note SS11 was cancelled

Plenary Sessions

Monday 19th June, 17.00 – 18.20, Pentland Auditorium

Industry Panel

Session Chairs: Dr. Michael Condry, IES Senior AdCom, USA
Dr. Thomas Strasser, Austrian Institute of Technology, Austria

Tuesday 20th June, 08.40 – 10.30, Pentland Auditorium

Welcome Session

Session Chair: Prof. Marcian Cirstea, Anglia Ruskin University, UK

Time: 08:40 - 09:10
Presentation: Welcome from the Conference Chairs and IEEE IES

Keynote Speakers

Session Chairs: Prof. John Hung, Auburn University, USA
Prof. Peter Palensky, Delft University of Technology, Holland

Time: 09:10 – 09:50
Speaker: Prof. Joachim Holtz, Germany
Presentation: *Predictive Current Control - When to use?*

Time: 09:50 – 10:30
Speaker: Dr. Andrei Dinu, UTC Aerospace Systems, UK
Presentation: *Flying through a Solar Storm - The Radiation Challenge*

Wednesday 21st June, 09.00 – 10.20, Pentland Auditorium

Keynote Speakers

Session Chairs: Prof. Xinghuo Yu, RMIT University, Australia
Prof. Kamal Al-Haddad, Ecole de Technologie Superieure, Canada

Time: 09:00 – 09:30
Speaker: Dr. Akira Nakajima, AIST, Japan and Prof. Shankar Ekkanath Madathil, Rolls-Royce, UK
Presentation: *Recent Status in Polarization Super Junction Technologies in Gallium Nitride*

Time: 09:40 – 10:20
Speaker: Dr. Domenico Vicinanza and Dr. Genevieve Williams, Anglia Ruskin University, UK
Presentation: *Sound Enigneering for Data Analysis and Exploration*

Industry Panel

Monday 19th June, 17.00 – 18.20, Pentland Auditorium

Smart Cities and Connectivity

Smart Cities allows a collection of devices from power, lighting, HVAC, and many other systems to be remotely controlled for greater efficiency and utilization. Potentially there are billions of devices connected to the cloud and accessed by multiple sources including end user devices. As momentum for Smart Cities grows so does the communication requirements that needs to scale appropriately. New communication efforts like Wireless 5G claim they are needed to scale to Smart Cities needs. This panel discusses Smart Cities, progress and challenges, and also examines the communication needs attempting to determine where and if 5G technologies are needed for Smart Cities solutions.

Panel Chairs:

Michael Condry
IEEE TEMS President, IES Senior AdCom, Intel Client CTO (retired), USA

Thomas Strasser
Senior Scientist, Austrian Institute of Technology, Austria

Panel Members:

Vassilis Seferidis
CEO, Zeetta Networks Limited, UK

Joern Ploennigs
Research Scientist, Manager Cognitive IoT for Buildings and Environment
Ireland Research Lab, Ireland

Stamatis Karnouskos
Internet of Things / Big Data Expert
SAP, Germany

Moray Rumney
Lead Technologist
Keysight Technologies Ltd.

Keynote Speakers

Prof. Joachim Holtz

Tuesday 20th June, 09.10 – 09.50, Pentland Auditorium

Prof. Joachim Holtz graduated in 1967 and received the Ph.D. degree in 1969 from the Technical University Braunschweig, Germany.

In 1969 he became Associate Professor and, and in 1971 Full Professor and Head of the Control Engineering Laboratory, Indian Institute of Technology in Madras, India. He joined the Siemens Research Laboratories in Erlangen, Germany in 1972. From 1976 to 1998, he was Professor and Head of the Electrical Machines and Drives Laboratory, Wuppertal University, Germany. He is presently Professor Emeritus and a Consultant.

His publications include 2 invited papers in the PROCEEDINGS OF THE IEEE, 17 invited papers in IEEE Journals, and 27 single-authored IEEE Journal papers. He is the recipient of 17 Prize Paper Awards and a coauthor of seven books. He holds 33 patents.

Prof. Holtz is the recipient of the IEEE Industrial Electronics Society Dr. Eugene Mittelmann Achievement Award, the IEEE Industrial Applications Society Outstanding Achievement Award, the IEEE Power Electronics Society William E. Newell Field Award, the IEEE Third Millennium Medal, the Anthony J. Hornfeck Service Award, and the IEEE Lamme Gold Medal. He is a Life Fellow of the IEEE.

Prof. Holtz is Past Editor-in-Chief of the IEEE Transactions on Industrial Electronics, Distinguished Lecturer of the IEEE Industrial Applications Society and IEEE Industrial Electronics Society.

Predictive Current Control - When to use?

Predictive current control is currently attracting the interest of many researchers. The predictive algorithm directly generates the firing pulses of the inverter, thus eliminating a pulsewidth modulator. A maximum magnitude of the current error is permitted, defined as the difference between reference and actual current space vectors. Inverter gate pulses are generated such as to maximize the time difference between any two switching instants. This optimizes the relation between switching frequency and harmonic current distortion.

Choosing the maximum magnitude of the current error is a critical issue. A low value increases the switching frequency and reduces current distortion, but it does not provide the algorithm with time to wait for the next optimum switching instant. This results in non-optimal conditions which tend to be equivalent to regular carrier modulation. It is therefore mandatory to permit large current errors and operate at low switching frequency. The exclusive application is then in high power inverters. The high switching losses of medium voltage power semiconductor devices require operation at extreme low switching frequency. Predictive control nevertheless achieves low harmonic current distortion, owing to the optimal switching sequences of predictive current control.

Dr. Andrei Dinu

Tuesday 20th June, 09.50 – 10.30, Pentland Auditorium

Dr. Andrei Dinu received the B.Eng. and M.Sc. degrees in electrical engineering from Transilvania University of Brasov (Romania) in 1995 and 1996 respectively.

He received a PhD degree in electrical engineering from De Montfort University in Leicester (UK) in 2000 based on research in the applications of artificial neural networks to induction motor control.

Dr. Dinu was a lecturer in control systems and digital electronics at De Montfort University between 2000 and 2003 and he joined the industrial sector in 2004. He is currently senior chief engineer for control systems with UTC Aerospace Systems where he coordinates the design and certification of electronic equipment for civil aircraft.

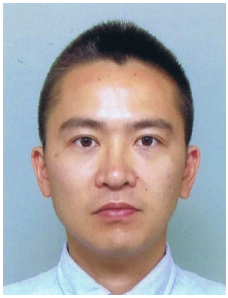
Flying Through a Solar Storm – The Radiation Challenge

The presentation will open with a historical view of the increasing role of electrical and electronic equipment on modern aeroplanes, touching on concepts such "More Electric Aircraft" and "All Electric Aircraft". General design drivers such as weight, volume, cost and reliability will be discussed in some detail before diving into the fascinating effects of cosmic radiation on the reliability of modern digital devices (even at sea level!)

The suitability of established technical solutions such as radiation hardening, Dual Modular Redundancy (DMR) and Triple Modular Redundancy (TMR) will be discussed highlighting the difference between radiation tolerance and radiation immunity. The applicability of such solutions to the particular requirements of motor drive systems will be judged in more detail based on three crucial criteria: cost, reliability and certifiability. The particular challenges of airworthiness certification will receive special attention because any technical solution needs to be thoroughly tested and therefore it needs to be testable. This is because in aerospace you are always "guilty before proven innocent"!

Dr. Akira Nakajima and Prof. Shankar Ekkanath Madathil

Wednesday 21st June, 09.00 – 09.40, Pentland Auditorium



Dr. Akira Nakajima is a senior researcher in Advanced Power Electronics Research Centre at the National Institute of Advanced Industrial Science and Technology in Japan. He received his Ph.D. from the Toyohashi University of Technology, Japan. In 2006, he proposed PSJ concept for next-generation power ICs. In 2009, as a Newton International Fellow supported by the British Royal Society, he joined a research team in the University of Sheffield, UK and developed PSJ platform wafers and power devices. He is a pioneer in demonstrating GaN CMOS technologies in 2016. Currently, his research interest is ultra-high density power converter technologies over 50 W/cc@2020. He is a member of GaN Open Innovation Laboratory (GaN-OIL) in Japan, opened under the leadership of Prof Amano, the Nobel Laureate, who won the award in 2014.

Prof Shankar Ekkanath Madathil at EM Sankara Narayanan is a Royal Society Industry Fellow at Rolls-Royce where he works on the systems impact of next generation power electronics technologies and was a Royal Academy of Engineering Chair in Power Electronics from 2007-2013. His team has proven world leading design-2-manufacture expertise in Silicon and GaN. Presently, his work is focused on ultra-high power density power conversion solutions, which ranges from materials to circuits and thermal management with a focus on effective use of high value materials and manufacturing techniques for aerospace applications, through direct support from Rolls-Royce. He is an editor of IEEE TDMR, IEEE-TED and an associated editor of IET PEL and holds 40 patents/applications and published in excess of 250 articles.

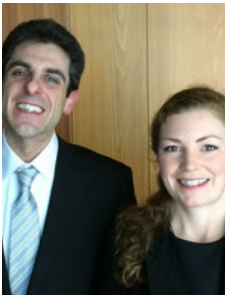
Recent Status in Polarization Super Junction Technologies in Gallium Nitride

Transition from the conventional scheme of manufacturing circuits using discrete components to that of a fully integrated power system-on-chip is anticipated to be a prerequisite to take advantage of the high-frequency power switching benefits offered by GaN devices. High slew rates, in the presence of parasitic inductance (device/package/circuit) can result in over-voltage transients, which can seriously impair the functionality of a GaN device. Even with the most innovative packaging approaches, a finite residual inductance is present. Monolithic integration of gate drive circuitry with power devices on a single technology platform is considered as an essential approach to minimize parasitic inductance in the circuitry and therefore enable stable high-frequency operation, efficiency and power densities unachievable by existing techniques. The fundamental requirement of a semiconductor technology platform that enables simultaneous development of a wide range of high voltage and low voltage devices in GaN as required for integration is served by the Polarisation Super Junction (PSJ) platform. This PSJ solution also offer novel opportunities in power converter topologies (e.g. super multi-level or interleaved converters) and their applications in hash environments, and we will also discuss such possibilities.

Recent reports on the performance of vertical devices fabricated on bulk GaN substrates have shown performance close to the theoretical limits. However, marginal improvement in performance over Silicon Carbide (SiC) and the high cost of bulk GaN substrates will make market adoption difficult. However, the scenario can be transformed by implementing super junction architectures in GaN that can then enable ultra-high efficiency and reduction in on-state losses by orders of magnitude, thus making the solution highly competitive. A reduction of almost two orders of magnitude in RON.A can be achieved using vertical PSJ (VI-PSJ) structures for breakdown voltage of 1kV, which could extend to three orders of magnitude improvement for 10kV devices, in comparison to conventional SiC devices.

Dr. Domenico Vicinanza and Dr. Genevieve Williams

Wednesday 21st June, 09.40– 10.20, Pentland Auditorium



Dr. Domenico Vicinanza is a Senior Lecturer in Electronics at Anglia Ruskin University in Cambridge, where he is also the director of the Sound And Game Engineering (SAGE) research group. He received his PhD in Physics working at the European Laboratory for Particle Physics (CERN, Geneva) and he is a professional music composer and orchestrator. He is also a product manager for GÉANT, the European Network for Research and Education. He worked for seven years as a Researcher at University of Salerno and Roma Tre and as a Scientific Associate at CERN, where he was involved in the research and development for particle physics detectors at the Large Hardon Collider (LHC) in Geneva. He has an active collaboration with CERN working on using sound engineering for physics data analysis and with NASA, working on satellites and space probes data processing.

Dr. Genevieve Williams is a Senior Lecturer in Sports Biomechanics at Anglia Ruskin University where she is also the co-director of the Cambridge Centre for Sport and Exercise Sciences (CCSES) research group. She gained her PhD in Biomechanics and Motor Control from Cardiff Metropolitan University. She then worked at University of Massachusetts in the Department of Kinesiology on how whole body movement coordination changes during learning. She then worked at the Penn State University exploring methods of quantifying coordination of whole body motor skills. Dr Williams' interests are in understanding movements from a Dynamical Systems theory perspective, health research including ADHD, knee health, healthy gait, and on analysis of data using sonification.

Sound Engineering for data analysis and exploration

In this talk, the presenters will be demonstrating how sound engineering, digital signal processing and spectral analysis are increasingly being used in science and engineering as novel and powerful data exploration tools. In particular, the talk will show how the combination of smart sensors and the audification of scientific data is progressively being used as a way to provide qualitative and quantitative tools to investigate relationships and symmetries, highlighting patterns and detecting anomalies in physics, engineering and life sciences.

Dr Vicinanza and Dr Williams will take the audience for a journey through the many ways of listening to scientific data, employing advanced techniques to process sound signals: from hearing the differences between stem cells, to analysing data from NASA satellites, and from innovative ways of offering physical therapies to novel diagnostic techniques in health science and rehabilitation. The presentation will be followed by live demonstrations, showing interactive sonification in action.

Tutorials

Monday 19th June, 14.00 – 16.30

Tutorial 1: **New Trends in Battery Management Systems for Lithium Ion Batteries**
Location: Sidlaw Auditorium (Level 3)
Presenters: Dr. Federico Baronti and Dr. Mo-Yuen Chow
University of Pisa, Italy and North Carolina State University, USA

Tutorial 2: **Tiny Inductively Powered Battery Chargers**
Location: Carrick 1 (Level 1)
Presenters: Prof. Gabriel A. Rincón-Mora, Georgia Institute of Technology, USA

Tutorial 3: **Periodic Control of Power Electronic Converters**
Location: Pentland Auditorium (Level 3)
Presenters: Dr. Keliang Zhou, Dr. Yongheng Yang and Prof. Frede Blaabjerg
University of Glasgow, UK and Aalborg University, Denmark

Tutorial 5: **High-efficiency power conversion with silicon**
Location: Harris 1 (Level 1)
Presenters: Dr. Neville McNeill, University of Strathclyde, UK

Tutorial 6: **Fundamentals, Modulation and Control of MMC**
Location: Fintry Auditorium (Level 3)
Presenters: Prof. Remus Teodorescu, Assoc. Prof. Laszlo Mathe and Assoc. Prof. Cristian Lascu
Aalborg University, Denmark

Tutorial 7: **Design Considerations for Energy Storage Systems based on Supercapacitors and Batteries**
Location: Carrick 2 (Level 1)
Presenters: Dr. Christian Klumpner, University of Nottingham, UK

Tutorial 8: **Smart Open-Source Electronics**
Location: Harris 2 (Level 1)
Presenters: Mr. Stephen Clemmet, Atom Ltd, UK

Please note Tutorial 4 - Control Architectures for Power Quality Enhancement in Microgrids has been cancelled.

Student Paper Travel Assistance (IES SPTA) 3Ms Presentations

Tuesday 20th June, 16.10 – 18.10, Ochil 2

The recipients of the IEEE IES Student Paper Travel Assistance (IES SPTA) will present their project in a 3-minute speech (3Ms) with a hardware demonstration (if applicable) or video clip. Please refer to page 35 for the list of recipients.

Presentation of the diplomas shall take place following this session during the Festive Dinner ceremony.

Oral Sessions

Instructions for Session Chairs

Session Chairs are asked to collect their packs from the Registration Desk well before their session. To ensure smooth running of the conference, Session Chairs are kindly asked to strictly respect the schedule.

An evaluation form should be completed for each session by the Session Chairs and left at the registration desk.

The length of presentations is restricted to 20 minutes, including questions. The authors are strongly advised to keep their oral presentation within 15 minutes and to leave 5 minutes for discussion with the audience and change of speaker. Session Chairs are kindly asked to closely monitor the timing against the schedule. In case of "no show", the session must be either suspended until the time the next paper is scheduled or closed if there are no more papers in the session.

Additional Instructions for Session Chairs in Pentland, Fintry and Sidlaw Auditoriums and Lomond Suite (Tinto, Moorfoot and Kilsyth Rooms)
Presentations are run from a centrally controlled presentation system and cannot be loaded from the room. Authors must go to Soutra room on the ground floor (level 0) minimally 1 hour before their session, so their presentation can be checked and pre-loaded for display. Presentations should be on a USB stick in PowerPoint, PDF or Keynote format. At the start of your session, please check that all presenters have visited Soutra and that their presentation has been checked and loaded. Authors have been asked to provide Session Chairs with short printed biographies (50 words maximum).

Additional Instructions for Session Chairs in Galloway Suite (Carrick, Harris and Ochil Rooms)
Rooms will be equipped with a computer, a projector and a screen. Presentations must be downloaded to the computer before the session starts. Authors have been asked to meet Session Chairs at the session room a few minutes before the beginning of the session and to provide them with their presentations (in MS PowerPoint or PDF) and short printed biographies (50 words maximum).

Instructions for Presenters of Papers

Instructions for Presenters of Papers in Pentland, Fintry and Sidlaw Auditoriums and Lomond Suite (Tinto, Moorfoot and Kilsyth Rooms)
Presentations are run from a centrally controlled presentation system and cannot be loaded from the session room. Authors are kindly requested to visit Soutra room on the ground floor (level 0) as soon as possible, minimally 1 hour before their session, so their presentation can be checked and pre-loaded for display. Presentations should be on a USB stick in PowerPoint, PDF or Keynote format, with all required fonts embedded in their presentation files. Authors have to provide the co-chairs with a short (50 words maximum) printed biography.

The length of the presentation is restricted to 20 minutes, including questions. Authors are strongly advised to keep their oral presentation within 15 minutes (about 15 slides) and to allow 5 minutes for discussion with the audience and change of speaker.

Instructions for Presenters of Papers in Galloway Suite (Carrick, Harris and Ochil Rooms)
Authors are kindly requested to meet their Session co-chairs in the session room a few minutes before the scheduled time in order to download their presentation to the computer. They have to provide the co-chairs with a Powerpoint or PDF presentation, as well as a short (50 words maximum) printed biography. Authors must ensure that all fonts needed are embedded in their presentation files.

The files can be downloaded to the computer from a USB key. The use of the author's computer will not be allowed, in order for sessions to run smoothly.

Tuesday 20th June - Session 1

TU1 - Kilsyth (0K) - 10:50-12:50

Chairs: Mo-Yuen Chow and Michael Basin

T3 - Control Systems and Applications

EF-011002 Continuous Fixed-Time Controller for Stabilizing an Armature-Controlled DC Motor
Michael Basin, Pablo Rodriguez-Ramirez, Fernando Guerra-Avellaneda

EF-011029 Discrete-time controller for stochastic polynomial systems with Poisson noises
Miguel Hernandez-Gonzalez, Michael Basin

EF-010839 Dynamic Modeling of a Resonant Wireless Power Transfer Circuit
Mattia Forato, Manuele Bertoluzzo, Giuseppe Buja

EF-006327 Development and experimental validation of a LQG control for a pre-compensated multi-axis piezosystem
Luca Cavanini, Luigi Colombo, Gianluca Ippoliti, Giuseppe Orlando

EF-003468 A Big Data Based Deep Learning Approach for Vehicle Speed Prediction
Zheyuan Cheng, Mo-Yuen Chow, Daebong Jung, Jinyong Jeon

EF-009962 Adaptive Neuro Fuzzy PID Type II DC Shunt Motor Speed Controller with Petri Transition Layer
Piotr Derugo

TU1 - Moorfoot (0M) - 10:50-12:50

Chairs: Maria Carmela Di Piazza and Wesley Doorsamy

T2 - Electrical Machines and Industrial Drives

EF-007323 Adaptive Torque Control of IPMSM Motor Drives for Electric Vehicles
Sarayut Amornwongpeeti, Oleh Kiselychnyk, Jihong Wang, Nastaran Shatti, Nirav Shah, Michail Soumelidis

EF-006467 A New Fault-Tolerance Motor with Decoupled Reluctance Channel and PM Channel
Qian Chen, Xun Fan, Guohai Liu, Wenxiang Zhao, Jinghua Ji, Liang Xu, Gaohong Xu

EF-005959 Dead Time and Nonlinearities Compensation for VSI Feeding AC drives
Mauro Di Monaco, Umberto Abronzini, Ciro Attaianese, Matilde D'Arpino, Vito Nardi, Giuseppe Tomasso

EF-007749 A comprehensive dynamic model for accurate power efficiency analysis in induction motor drives
Maria Carmela Di Piazza, Marcello Pucci

EF-003441 Investigation of Thermal Instability Testing on Synchronous Generator Rotors using an Experimental Direct Mapping Method
Amesh Singh, Wesley Doorsamy, Willem Cronje

EF-006645 Investigation into Effects of a Novel Rotor Cut-off Design for Synchronous Reluctance Machines
Wesley Doorsamy, Mbika Muteba, Bhekisipho Twala, Dan-Valentin Nicolae

TU1 - Tinto (0T) - 10:50-12:50

Chairs: Peter Palensky and Romeo Ciobanu

T1 - Power Systems and Smart Grids

EF-008079 A Double End Fault Location Technique for Distribution Systems Based on Fault-Generated Transients
Fathy Aboshady, Mark Sumner, David Thomas

EF-003824 Autonomous Microgrid with Energy Storage System
Lucas Araujo, Marcelo Villalva, Thais Siqueira

EF-006432 Fuzzy energy management strategy based on Microgrid Energy Rate-of-Change applied to an electro-thermal residential microgrid
Diego Arcos-Aviles, Francesc Guinjoan, Julio Pascual, Luis Marroyo, Pablo Sanchis, Danny Sotomayor, Jacqueline Llanos Proaño, Martin P. Marietta

EF-004995 Identification of pilot nodes for secondary voltage control using K-means clustering algorithm
Romeo Ciobanu, Gheorghe Grigoras, Bogdan Neagu, Florina Scarlatache

EF-009725 Improved Islanded Operation of a Diesel Generator - PV Microgrid with Advanced Inverter
Brandon Blackstone, Christopher Hicks, Octavio Gonzalez, Yahia Baghzouz

EF-007811 Fully-Dispatchable Microgrid Architecture, Implementation and Experimental Validation
Tommaso Caldognetto, Paolo Tenti, Danilo Iglesias Brandao

TU1 - Carrick 1 (1C-1) - 10:50-12:50

Chairs: Eric Monmasson and Juan Jose Rodriguez-Andina

T8 - Electronic Systems-on-Chip and Embedded Systems

EF-000442 A Novel ANFIS Algorithm Architecture for FPGA Implementation
John Darvill, Alin Tisan, Marcian Cirstea

EF-012459 Emulation of electronic instrumentation devices supporting sailboat's autonomous navigation
Hugo Marques, Luis Gomes, Aniko Costa

EF-006556 Towards Predictabe Execution Model on ARM-based Heterogeneous Platforms
Premysl Houdek, Michal Sojka, Zdenek Hanzalek

EF-003298 Evaluation of the hardwired sequence control system generated by high-level synthesis
Naoki Fujieda, Shuichi Ichikawa, Yoshiki Ishigaki, Tasuku Tanaka

EF-001864 A Simple Two-Transistor 4D Chaotic Oscillator and Its Synchronization via Active Control
Irfan Ahmad, Banlue Srisuchinwong

EF-012106 Implementation of Particle Swarm Optimization in FPSoC Devices
Roberto Fernández-Molanes, Martin Garaj, Wallace Tang, Juan J. Rodríguez-Andina, José Fariña, Kim F. Tsang, Kim F. Man

TU1 - Carrick 2 (1C-2) - 10:50-12:50

Chairs: George Wilson and Sota Shimizu

T9 - Computational Intelligence. Image Processing

EF-006866 Soft Computing Classifier Ensemble for Fault Diagnosis
Jeferson de Oliveira Batista, Rodrigo Biancardi Rodrigues, Flávio Miguel Varejão

EF-003891 Battery Grouping with Time Series Clustering based on Features
Jiayun Yang, Guojin Ma, Mingyu Gao, Zhiwei He

EF-007846 Considerations about Saliency Map from Wide Angle Fovea image
Tatsuya Yamazaki, Sota Shimizu, Nobuyuki Hasebe

EF-004448 Feature Extraction and Background Information Detection Method using Power Demand
Masahiro Yoshida, Tomoya Imanishi, Hiroaki Nishi

EF-005789 A Nonlinear Background Updating Scheme
Xiqun Lu, Zhixiang Yang

EF-003085 An adaptive self-organizing fuzzy logic controller in a serious game for motor impairment rehabilitation
Shabnam Sadeghi Esfahlani, George Wilson, Silvia Cirstea, Alireza Sanaei

TU1 - Carrick 3 (1C-3) - 10:50-12:50

Chairs: Giampaolo Buticchi and Dorin Petreus

SS09 - On-board Micro-grid for the More Electric Aircraft

EF-001236 A Quadruple Active Bridge Electrical Power Distribution System for the More Electric Aircraft
Giampaolo Buticchi, Levy Ferreira Costa, Marco Liserre

EF-010286 Resilient multi-bus distribution in More Electric Aircraft by means of Dual Active Bridges
Giampaolo Buticchi, Levy Ferreira Costa, Marco Liserre

EF-002321 Investigation on the Selection of a More Suitable Power System Architecture for Future More Electric Aircraft from the Prospective of System Stability
Jiawei Chen, Chengjun Wang, Jie Chen

EF-013153 GaN-based Triple Active Bridge for Avionic Application
Francesco Giuliani, Giampaolo Buticchi, Marco Liserre, Paolo Cova, Nicola Delmonta, Nicola Pignoloni

EF-011401 Model and Energy Management System for a Parallel Hybrid Electric Unmanned Aerial Vehicle
Elisabetta Bongermino, Fabio Mastrorocco, Michele Tommaselli, Vito Giuseppe Monopoli, David Naso

SS21 - Control and Management of local networks with energy storage

EF-006904 An islanded renewable energy microgrid emulator for geothermal, biogas, photovoltaic and lead acid battery storage
Radu Etz, Dorin Petreus, Toma Patarau, Eniko Lazar

TU1 - Harris 1 (1H-1) - 10:50-12:50

Chairs: Peter Korondi and Kiyoshi Ohishi

T6 - Mechatronics and Robotics

EF-009261 Path-following in three dimensions using quaternions for a fixEF-wing UAV
Tom Stian Andersen, Raymond Kristiansen

EF-004618 Safe Tremor Suppression through Arm Movement Control
Dylan Arnal, Toshiyuki Murakami, Takahiro Nozaki

EF-005142 Using Interval Type-2 Fuzzy Interpolation Method to Calibrate Parallel Machine Tools
Ying Bai, Dali Wang

EF-006823 Ball Catching with Omni-directional Wheeled Mobile Robot and Active Stereo Vision
Sho-Tsung Kao, Yi Wang, Ming-Tzu Ho

EF-009849 An FPGA-based controller for collaborative robotics
Benjamin Jeppesen, Niladri Roy, Livia Moro, Federico Baronti

EF-003743 Velocity and Acceleration Constrained Trajectory Planning by Smoothing Splines
Hiroyuki Kano, Hiroyuki Fujioka

TU1 - Harris 2 (1H-2) - 10:50-12:50

Chairs: Diego Alonso and Joao Martins

T14 - Entrepreneurship and Management - Challenges for Industrial Electronics

EF-003921 Improving the Learning Experience and Outcomes in Entrepreneurial Courses
Diego Alonso, Juan Ángel Pastor, Bárbara ÁLvarez, Tanya Suarez, Igor Tasic

EF-005193 Beyond traditional entrepreneurship education in Engineering. Promoting IoT startups at university
Andres Iborra, Tanya Suarez, Pedro Sanchez, Juan A. Pastor, Diego Alonso

T13 - Engineering Education

EF-001791 Innovative Learning in Engineering Education: Experimenting with Short-term Project-oriented Research and Project-based Learning
Vicente Leite

EF-003034 Teaching Distribution Network Protection Through the Support of a Software Tool
Carlos Fortunato, Vitor Fernão Pires, João Martins

EF-008575 Teaching Intelligent Control Using a Laboratory-Scaled Process Mini-Plant
Yul Nazaruddin, Antony Siahaan

SS15 - Control Algorithm and Converter Topologies for Energy Efficient Control of AC Drives

EF-003735 Efficient induction motor drive with multilevel inverter and variable rotor flux
Rudolf Mecke

TU1 - Ochil 2 (10-2) - 10:50-12:50

Chairs: Antonio Luque-Estepa and Manus Henry

T10 - Sensors, Actuators and Micro-Nanotechnology

EF-003751 Analysis of Geomaterials using Frequency Modulated Continuous Wave Radar in the X-band
Jamie Blanche, David Flynn, Helen Lewis, Gary Couples, Rebecca Cheung

EF-005185 Introducing a New Method for Temperature Measurement by Magnetostrictive Position Sensors
Tobias König, Thomas Greiner, Achim Zern, Zoltán Kántor, Attila Szabó

EF-004693 Prism Signal Processing for Sensor Condition Monitoring
Manus Henry, Oleg Bushuev, Olga Ibryaeva

EF-002151 A GaN HFET Sensor For Respiration Monitoring
Shrawan Jha, Igor Bello

EF-013692 Touch Sensor Application of Spray Deposited ZnO Films
Shrawan Jha, Xu-Hua Wang, Hendrik Faber

EF-012467 Wind Speed and Direction Measurement based on Time of Flight Ultrasonic Anemometer
David Fernandes, Luis Gomes, Aniko Costa

TU1 - Fintry Auditorium (3F) - 10:50-12:50

Chairs: Federico Baronti and Seji Hashimoto

T5 - Renewable Electric Energy Conversion, Processing and Storage

EF-008753 Passivity-based Control of Active and Reactive power in single-phase PV Inverters
Domingo Biel, Jacquelien Scherpen

EF-011738 Circuit Design for an Impact-type Piezoelectric System for Micro-wind Energy Harvesting
Nan Chen, Tingcun Wei, Dong S Ha

EF-011797 Prediction of PEMFC Stack Efficiency Using Recurrent Neural Networks
Derick F. Pereira, Francisco C. Lopes, Edson H. Watanabe

EF-006734 A Flapping-Based Piezoelectric Power Generator for Bicycle Applications
Takumi Ishii, Takahiro Iwase, Seiji Hashimoto, Bunji Homma, Kenji Suto, Hiroaki Okada, Hideki Okuno, Shunji Kumagai

EF-012149 A photovoltaic panel modelling method for flexible implementation in Matlab/Simulink using datasheet quantities
Joanne Kitson, Samuel Williamson, Paul Harper, Chris McMahon, Ges Rosenberg, Michael Tierney, Karen Bell

EF-012726 DC Renewable Connected Building Grid for Intelligent LED Lighting System
L.H. Koh, Paing Soe Nyan, Hueh Chuah Ong, Zhe Zhang, JunJun Wang

TU1 - Pentland Auditorium (3P) - 10:50-12:50

Chairs: Chandan Chakraborty and Samir Mussa

T4 - Power Electronics and Energy Conversion

EF-001716 Six-Phase Active PWM Rectifier with Stationary Frame Reference Control
Samir Ahmad Mussa, Telles Lazzarin, Cesar Augusto Arbugeri

EF-006459 Unregulated AC-DC Power Supply under Heavy Load Operation: Simulation and Design
Acacio Amaral, Antonio Cardoso

EF-008729 Calorimetric Measurements with Compensating Temperature Control
Sven Bolte, Lukas Keuck, Jehan Khan Afridi, Norbert Fröhleke, Joachim Böcker

EF-008583 Comparison and Combination of Digital Controls for Single-Phase Boost PFC Converters in Avionic Power Systems
Juan Jose Cabezas, Raul Gonzalez, Emilio Figueres, Gabriel Garcera

EF-005665 SRM converter topologies for EV Application: state of the technology
David Cabezuelo, Jon Andreu, Iñigo Kortabarria, Edorta Ibarra, Jose Ignacio Garate

EF-008559 A Novel Single-Phase Five-Level Active Rectifier for On-Board EV Battery Chargers
Vitor Monteiro, Gabriel Pinto, Andres Melendez, Joao Afonso

TU1 - Sidlaw Auditorium (3S) - 10:50-12:50

Chairs: Remus Teodorescu and Guozhu Chen

T4 - Power Electronics and Energy Conversion

EF-013781 Low Voltage Fault Ride Through Control in MMC-HVDC
Sanjay Chaudhary, Remus Teodorescu, Dimitrios Rizadis, Laszlo Mathe

EF-004723 Analysis and Design of Fast-Transient Strategy Based on Modified Fast Repetitive Control for Shunt Active Power Filter
Dongdong Chen, Jingling Cheng, Yaowei Hu, Guozhu Chen

EF-001198 An Improved SHE Algorithm and Filter Design Method for High Power Grid-Connected Converter under Unbalanced and Harmonic Distorted Grid
Jingling Cheng, Dongdong Chen, Yaowei Hu, Guozhu Chen

EF-004014 Model Predictive Control of a Multilevel Current Source Inverter Together with its Current Source
Pablo Cossutta, Mathias Angelico Engelhardt, Miguel Aguirre, Juan Ponce, Maria Ines Valla

EF-005274 Generation of new power processing structures exploiting genetic programming
Gines Domenech-Asensi, Tom J Kazmierski

EF-009997 Distribution and shaping of magnetic field of wireless energy transfer system
Michal Frivaldský, Miroslav Pavelek, Pavol Spanik

Tuesday 20th June - Session 2

TU2 - Kilsyth (0K) - 13:50-15:50

Chairs: Rodrigo Azzolin and Sheng-Hong Tsai

T3 - Control Systems and Applications

EF-001724 Optimal Control of Weighted Networks Based on Node Connection Strength
Jie Ding, Changyun Wen, Guoqi Li

EF-010502 Friendly Re-Programmed Social Robot
Haissam El-Aawar

EF-003662 Performance Comparison of Control Strategies Applied on Welding Robot Plant
Paulo Evald, Jusoan Mór, Débora Paula, Andreyna Ferreira, Silvia Botelho, Rodrigo Azzolin

EF-003697 Control of Linear Welding Robot Plant by Pole Placement Control Based on Discrete Kalman Filter
Paulo Evald, Jusoan Mór, Silvia Botelho, Rodrigo Azzolin

EF-012521 Feedback Control Based on Estimators Applied on Welding Robot Motor
Paulo Evald, Jusoan Mór, Silvia Botelho, Rodrigo Azzolin

EF-005851 An Effective Optimal Linear Quadratic Analog Tracker for the System with Unknown Disturbances
Guo-Zhen He, Yau-Tarng Juang, Jason Sheng-Hong Tsai, Yun-You Lin, Shu-Mei Guo, Leang-San Shieh, Tzong-Jiy Tsai

TU2 - Moorfoot (0M) - 13:50-15:50

Chairs: K. Gopakumar and Mateus Giesbrecht

T2 - Electrical Machines and Industrial Drives

EF-001414 Harmonic Coupling Analysis of a Multi-Drive System with Slim DC-link Drive
Yang Feng, Jun Bum Kwon, Xiongfei Wang, Frede Blaabjerg

EF-003115 A Method to Determine Load Conditions for Salient Pole Synchronous Machine Quadrature Axis Parameters Determination
Mateus Giesbrecht

EF-002089 The Research on Temperature Field and Flow Field of Brushless Doubly-Fed Generator With Cage-Barrier Rotor
Xiaodong Jiang, Fengge Zhang, Yingguang Li

EF-001252 Multilevel Dodecagonal Space Vector Generation Using Stacked Inverter Cells for IM drives
Apurv Yadav, Mathews Boby, Sumit Pramanick, Gopakumar K, Leopoldo Franquelo

EF-008095 Dependence of the Adaptive Full-Order Observer Stability on Parameter Identification Errors
Mateusz Korzonek, Teresa Orlowska-Kowalska

EF-001201 Sensorless Start-Up of Soft Starter Driven Line-Start PMSM Based on Back EMF Measurement
Heiko Zatocil, Hauke Nannen

TU2 - Tinto (OT) - 13:50-15:50

Chairs: Peter Palensky and Samir Mussa

T1 - Power Systems and Smart Grids

EF-007218 Three-phase Frequency Estimator in Smart Grid Applications: Practical Issues Using FPGA
Samir Ahmad Mussa, Edhuardo Francisco Celli Grabovsk

EF-005614 Three phase high power contactless power supply for harbour automated guided vehicles
Faical Turki, Marc Detweiler, Thomas Vosshagen

EF-004707 On-line Monitoring of Metal-oxide Surge Arresters using Improved Equivalent Model with Evolutionary Optimisation Algorithm
Wesley Doorsamy, Pitshou Bokoro

EF-005533 Peer-to-Peer Decentralized Control Structure for Real Time Monitoring and Control of Microgrids.
Silvia Marzal, Robert Salas-Puente, Raúl González-Medina, Gabriel Garcerá, Emilio Figueres

EF-007153 An Enhanced Hierarchical Control Strategy for the Internet of Things-based Home Scale Microgrid
Yajuan Guan, Juan C. Vasquez, Josep M. Guerrero

EF-010863 A Battery Energy Management Strategy for UK Enhanced Frequency Response
Burcu Gundogdu, Shahab Nejad, Daniel Thomas Gladwin, David Stone

TU2 - Carrick 1 (1C-1) - 13:50-15:50

Chairs: Eric Monmasson and Alin Tisan

T8 - Electronic Systems-on-Chip and Embedded Systems

EF-002968 FPGA based implementation of a Sliding-Mode observer for battery state of charge estimation.
Gianluca Vicidomini, Giovanni Petrone, Eric Monmasson, Giovanni Spagnuolo

EF-003794 Low-Latency Smartphone App for Real-Time Noise Reduction of Noisy Speech Signals
Aditya Bhattacharya, Abhishek Sehgal, Nasser Kehtarnavaz

EF-003948 Real-Time Implementation of Voice Activity Detector on ARM Embedded Processor of Smartphones
Abhishek Sehgal, Fatemeh Saki, Nasser Kehtarnavaz

SS18 - IoT Technology for Reliable User-Centric Sensing and Healthcare Applications

EF-012645 Optimized PPG-Based Wearable Acquisition Unit for Massive Analysis of Heart Rhythms
César Veiga, Daniel Rivera, Abraham Paz, Diego Castiñeira, José Fariña, Juan J. Rodriguez-Andina, Enrique García, Andrés Iñiguez

EF-013307 Using Support Vector Machines for atrial fibrillation screening
Daniel Rivera, Cesar Veiga, Juan J. Rodriguez-Andina, José Fariña, Enrique García

TU2 - Carrick 2 (1C-2) - 13:50-15:50

Chairs: Christian Klumpner and Yushan Liu

SS02 - Impedance Source Converters: Control, Improved Topologies, and Emerging Applications

EF-000523 Optimizing Control Strategy of Quasi-Z Source Indirect Matrix Converter for Induction Motor Drives
Maoxing Li, Yushan Liu, Haitham Abu-Rub

EF-003506 PWAM Controlled Quasi-Z Source Motor Drive
Yi Li, Yushan Liu, Haitham Abu-Rub

EF-010383 Symmetrical Switching Patterns and an Adaptive Modulator for Three-Phase Quasi-Z-Source Inverters
Piotr Majtczak, Jacek Rabkowski

EF-009954 Model Predictive Control for Maximum Power Point Tracking of Quasi-Z-Source Inverter Based Grid-Tied Photovoltaic Power System
Morcos Metry, Yushan Liu, Robert S. Balog, Haitham Abu-Rub

SF - Student and Young Professionals Forum

EF-005525 Optimal Operating Point of Medium Frequency Resistance Spot Welding Systems
Jernej Cernelic, Robert Brezovnik, Jožef Ritonja, Drago Dolinar, Martin Petrun

EF-007102 Investigating the Benefits and Limitations of Cascaded Converter Topologies used in Modular Battery Systems
Ahmed Fares, Christian Klumpner, Mark Sumner

TU2 - Carrick 3 (1C-3) - 13:50-15:50

Chairs: João Martins and Dimitri Vinnikov

SS07 - New Era of Prosumers: Operation Strategies, Control Algorithms and Power Electronics

EF-000353 Multiphase Galvanically Isolated Impedance-Source DC-DC Converter for Residential Renewable Energy Applications
Dmitri Vinnikov, Anrii Chub, Elizaveta Liivik

EF-001309 Controlling a Battery Energy Storage System to Support Residential Photovoltaic Installations
Vitor Pires, João Martins, Carlos Roncero-Clemente, Enrique Romero-Cadaval, Oleksandr Husev

EF-012491 PV Generators Combined With UPQC Based on a Dual Converter Structure
Vitor Pires, Daniel Foito, Armando Cordeiro, Joao Martins

EF-001589 Supraharmonics Reduction in NPC Inverter with Random PWM
Aurora Gil-de-Castro, Antonio Moreno-Munoz, Joaquin Garrido, Sarah Rönnberg, Emilio J. Palacios-Garcia, Tomás Morales

EF-012653 Startup Sequence for a Grid Connected Single Phase Voltage Source Inverter
Indrek Roasto, Tanel Jalakas, Argo Rosin

SS16 - Modelling, Analysis, and Management of Hybrid Energy Storage

EF-004561 A Novel Switched Capacitor Circuit for Battery Cell Balancing Speed Improvement
Yandong Wang, He Yin, Songyang Han, Amro Alsabbagh, Chengbin Ma

TU2 - Harris 1 (1H-1) - 13:50-15:50

Chairs: Ren Luo and Aleksander Malinowski

T6 - Mechatronics and Robotics

EF-004456 Consensus Formation Control Of Multiple Wheeled Mobile Robots
Yu-Dong Zhao, Dong-Eon Kim, Ha-Neul Yoon, Seong-IK Han, Jang-Myung Lee

EF-006939 Tapping Motion Control of Dynamic Impulse-Momentum Contact to Human Body for Robotic Therapeutical Percussive Massage
Ren C. Luo, Kai-Chun Hsieh

EF-007161 Trajectory Generation and Planning for Simultaneous 3D Printing of Multiple Objects
Ren C. Luo, Po-Kai Tseng

EF-001082 Virtual Robot Experiments for Navigation in Structured Environments
Jacob Knoll, Kyle Hevrdejs, Aleksander Malinowski, Suruz Miah

EF-003476 Heterogeneous Multi-Robot Trajectories for Area Coverage Optimization
Suruz Miah, Jacob Knoll, Aleksander Malinowski

EF-012602 Robust Force Control with a Novel Gain Tuning Methodology Based on the Stable Margin Theory
Kenji Ogawa, Kouhei Ohnishi, Yousef Ibrahim

TU2 - Harris 2 (1H-2) - 13:50-15:50

Chairs: Valeriy Vyatkin and Mohammad Elattar

T7 - Factory Automation and Industrial Informatics

EF-012661 Integration of OPC UA into a Web-based Platform to enhance interoperability
Salvatore Cavalieri, Damiano Di Stefano, Marco Giuseppe Salafia, Marco Stefano Scroppo

EF-012025 Network Planning in Smart Grids via a Local Search Heuristic for Spanning Forest Problems
George Davidescu, Thomas Stützle, Valeriy Vyatkin

EF-005568 Reliable Multipath Communication Approach for Internet-based Cyber-physical Systems
Mohammad Elattar, Tong Cao, Verena Wendt, Jürgen Jasperneite, Ansgar Trächtler

EF-006173 Evaluation of Multipath Communication Protocols for Reliable Internet-based Cyber-physical Systems
Mohammad Elattar, Maxim Friesen, Jürgen Jasperneite

EF-005657 Seamless Handover in Industrial WLAN using IEEE 802.11k
Stefan Feirer, Thilo Sauter

EF-009172 Analysis of the Requirements for Offering Industrie 4.0 Applications as a Cloud Service
Waqas Ali Khan, Lukasz Wisniewski, Dorota Lang, Jürgen Jasperneite

TU2 - Ochil 2 (10-2) - 13:50-15:50

Chairs: Matteo Nardello and Majeed Soufian

T10 - Sensors, Actuators and Micro-Nanotechnology

EF-005401 A Secure Mutual Trust Scheme for Wireless Sensor Networks
Alan Dahgwo Yein, Chih-Hsueh Lin, Wen-Shyong Hsieh

EF-010405 A low-cost smart sensor for Non Intrusive Load Monitoring applications
Matteo Nardello, Maurizio Rossi, Davide Brunelli

EF-003352 Development of a multistage six-axis force sensor with high dynamic range
Daisuke Okumura, Sho Sakaino, Toshiaki Tsuji

EF-010731 Architecture for security monitoring in IoT environments
Christos Stergiou, Kostas E. Psannis, Andreas P. Plageras, Giorgos Kokkonis, Yutaka Ishibashi

EF-011916 Optimal Actuator\Sensor Placement and Controller Design for Large Flexible Space Structures and Robotics
Majeed Soufian, Majid Borairi

T13 - Engineering Education

EF-006807 Determination of the Demagnetisation of Electrical Steel Strips
Gholamhossein Shirkoohi

TU2 - Fintry Auditorium (3F) - 13:50-15:50

Chairs: Federico Baronti and Giovanni Spagnuolo

T5 - Renewable Electric Energy Conversion, Processing and Storage

EF-000345 Voltage Balancing Control of a Symmetrical Nine-Phase Machine With Series-Connected DC Links
Ivan Zoric, Martin Jones, Emil Levi

EF-006882 A High-Performance FPGA-Based Virtual Anemometer for MPPT of Wind Energy Conversion Systems
Angelo Accetta, Maria Carmela Di Piazza, Giuseppe La Tona, Massimiliano Luna, Marcello Pucci

EF-001058 Study on the Influencing Factors and Mechanism of SSR due to DFIG-based Wind Turbines to a Series Compensated Transmission System
Xinyu Zhu, Zaiping Pan

EF-012483 A Novel Soft-stall Power Control for a Small Wind Turbine
Jagath Sri Lal Senanayaka, Hamid Reza Karimi, Kjell G. Robbersmyr

EF-007099 Optimized management of a residential microgrid using a solar power estimation database
Jorge Segarra-Tamarit, Emilio Pérez, J. Carlos Alfonso-Gil, Carlos Ariño, Néstor Aparicio, Hector Beltran

EF-011207 Performance estimation of a cell-to-cell-type active balancing circuit for lithium-ion battery systems
Manuel Räber, Djaffar Ould Abdeslam, Andreas Heinzelmann, Andres Ramirez

TU2 - Pentland Auditorium (3P) - 13:50-15:50

Chairs: John Hung and Catalina González Castaño

T4 - Power Electronics and Energy Conversion

EF-006076 Design of a bidirectional DC/DC converter with coupled inductor for an electric vehicle application
Catalina González, Enric Vidal, Javier Calvente

EF-003263 Evaluation of DC Voltage Ripple in Three-Phase PWM Voltage Source Inverters
Marija Vujacic, Manel Hammami, Milan Srndovic, Gabriele Grandi

EF-012769 The Compensation Strategy on The Drift Voltage Problem of Dual Modulation Waves based Neutral Point Potential Control for Three Level Converter
Bo Guan, Shinji Doki

EF-002135 Approximate Modeling and Control of an Energy Storage System for Microgrid Applications
Dante Inga Narvaez, Marcelo Gradella Villalva, Lucas Savoi de Araujo, Marcos Gomes dos Reis, Thais Gama de Siqueira

EF-000973 Gain scheduling control strategy for a single-phase grid-connected inverter
Jiao Jiao, John Hung, Robert Nelms

EF-002127 State feedback control for single-phase grid-connected inverter under weak grid
Jiao Jiao, John Hung, Robert Nelms

TU2 - Sidlaw Auditorium (3S) - 13:50-15:50

Chairs: Chengbin Ma and Tanmoy Maity

T4 - Power Electronics and Energy Conversion

EF-004758 Design Procedure of A Class E^2 DC-DC Converter for Megahertz Wireless Power Transfer Based on A Compact Class E Current-Driven Rectifier
Xinhong Fu, Ming Liu, Zefan Tang, Chengbin Ma

EF-009768 A Novel Modular Multilevel Step-up DC/DC Converter for Offshore Systems
He Liu, Mohamed Dahidah, James Yu, R. T. Naayagi, Matthew Armstrong

EF-003603 Analysis of a Clustered IGBT and Silicon Carbide MOSFET Hybrid Switch
Peng Luo, Hong Yao Long, Mark Sweet, M. M. De Souza, E. M. S. Narayanan

EF-007986 Modular Multilevel Matrix Converter for Offshore Low Frequency AC Transmission System
JianKai Ma, Mohamed Dahidah, Volker Pickert, James Yu

EF-001694 Real-time performance evaluation of Quasi Z-Source Inverter for Induction Motor Drives
Tanmoy Maity, Hanuman Prasad

EF-008206 Optimal Nonlinear Robust Control of a Boost Converter
Achilleas Markou, Argiris Soldatos, Nikos Hatziargyriou

Tuesday 20th June - Session 3

TU3 - Kilsyth (0K) - 16:10-18:10

Chairs: Chris Macnab and Zhiwei He

T3 - Control Systems and Applications

EF-003344 An Automatic Sealing System for Battery Lid Based on Machine Vision
Mingyu Gao, Xiao Li, Yuxiang Yang, Zhiwei He, Jiye Huang

EF-002488 Determination of the Equivalent Parameters for modelling a McPherson Suspension with a Quarter-Car Model
Jorge Hurel Ezeta, Francisca Flores Nicolalde, Juan Peralta, Bolivar Flores, Jorge Amaya

EF-009911 Control Characteristics of Passive Maglev Transport System
Chang-Hyun Kim, Chang-Wan Ha, Jaewon Lim, Jong-Min Lee, Doh Young Park

EF-003271 Nonlinear Adaptive Control of a Transcritical Organic Rankine Cycle
Chris Macnab, Jilan Samiuddin, Babak Badkoubeh-Hezaveh, Mahsa Sadeghassadi, Jeff Pieper

EF-007048 Improving existing methods for stable and more accurate Power Hardware-in-the-Loop experiments
Achilleas Markou, Vasilis Kleftakis, Panos Kotsampopoulos, Nikos Hatziargyriou

EF-001473 Perfect Model-Following System using Active Disturbance Rejection Control
Hirotaka Nakayama, Ryo Tanaka, Yoshihisa Ishida, Naoki Matsumoto

TU3 - Moorfoot (0M) - 16:10-18:10

Chairs: Luca Ferraris and Tian-Hu Liu

T2 - Electrical Machines and Industrial Drives

EF-000116 Auto-tuning Flux-weakening Control for an IPMSM Drive System Using a Predictive Controller
Tian-Hua Liu, Shao-Kai Tseng, Jui-Ling Chen, Mao-Bin Lu

EF-002437 Simulation of PMSM in Maxwell 3D/Simplorer to optimize Direct Flux Control
Tobias Mueller, Chan See, Arfan Ghani, Peter Thiemann

EF-005398 Efficiency Mapping of a 100 kW PMSM for Traction Applications
Martin Novak, Jaroslav Novak, Zdenek Novak, Jan Chysky, Oleg Sivkov

EF-011924 Current Control Strategy for Electric Motor Drives Using Long Cables
Ricardo Picatoste, Mark Butcher, Alessandro Masi

EF-011266 Study of the Halbach Magnetization in Small PM Electrical Machines Adopting the Bonded Magnets
Luca Ferraris, Emir Poskovic, Fausto Franchini

EF-005304 Design and Analysis of Coreless Multi-Layered Permanent Magnet Synchronous Motor
Koki Sakuma, Shyunya Takano, Tomoyuki Shimono, Takahiro Mizoguchi

TU3 -Tinto (0T) 16:10-18:10

Chairs: Chun-Lien Su and Wenzhou Lu

T1 - Power Systems and Smart Grids

EF-006696 DC link Voltage Control during Sudden Load Changes in AC Microgrids
W. Issa, R. Albadwawi, M. Abusara, S Sharkh, T. Mallick

EF-006858 Balancing The Grid With Single-Phase PV-Installations
Serdar Kadam, Benoit Bletterie

EF-008761 4k±1 -order Harmonic Repetitive Controller for Single-phase Micro-Grid Power Converter System with Nonlinear Loads
Wenzhou Lu, Manman Xue, Jiqiang Xu, Haiying Chen

EF-005169 Integration of a Pb-acid battery management algorithm into optimization control strategies for microgrid systems
Martin Marietta, Bruno Samaniego, Francesc Guinjoan, Guillermo Velasco, Robert Piqué, Hugo Valderrama Blavi

EF-012734 Consensus for Active Power Sharing and Frequency Restoration in Islanded Microgrids Subject to Drifting Clocks
Carlos X. Rosero, Pau Marti, Manel Velasco, Miguel Casilla, Jaume Miret, Antonio Camacho

EF-010545 Design of Transformer Load Monitoring Systems By Utilizing Smart Meter Data
Chun-Lien Su, Yu-Chi Pu, Hai-Ming Ching, Chao-Lin Kuo, Jheng-He Kuo

TU3 - Carrick 1 (1C-1) - 16:10-18:10

Chairs: Gabor Sziebig and Nasser Kehtarnavaz

SS06 - Internet of Robots

EF-008648 Robotized Multi-Pass Tungsten Inner Gas Welding of Francis Hydro Power Turbines
Csongor Mark Horvath, Trygve Thomessen, Peter Korondi

EF-013161 Kalman Filter Based Equivalent Elastic Force Feedback for Time-delay Compensation
Yuki Nagatsu, Seiichiro Katsura

EF-011231 Future Role of Application of New Technologies in Small-and Medium Scale Manufacturing Systems
Kinga Somlo, Gabor Sziebig

EF-011649 Remote Operation and Assistance in Human Robot Interactions with Vibrotactile Feedback
Gabor Sziebig, Peter Korondi

EF-007994 Mobile Robot Navigation in Natural Environments Using Robust Object Tracking
Gabor Kovacs, Naoaki Hoshi, Yasuharu Kunii

T9 - Computational Intelligence. Image Processing

EF-003808 Real-time Continuous Action Detection and Recognition Using Depth Images and Inertial Signals
Neha Dawar, Chen Chen, Roozbeh Jafari, Nasser Kehtarnavaz

TU3 - Carrick 2 (1C-2) - 16:10-18:10

Chairs: Neville McNeill and Mariana Ilas

T11 - Automotive Technology

EF-012432 A New Series of Brushless and Permanent Magnetless Synchronous Machines
Chandan Chakraborty, Saptarshi Basak, Yalla Tirumala Rao

EF-002372 Powertrain Systems of Electric, Hybrid and Fuel-Cell Vehicles: State of the Technology
David Cabezuelo, Jon Andreu, Iñigo Kortabarria, Iñigo Mtz. Alegría, Endika Robles

EF-002844 Parameter Selection for Efficient HOG-based car detection
Mariana Eugenia Ilas

EF-005363 Deploying SiC BJTs in an 800-V switchEF-mode power supply for hybrid & electric vehicles
Andrew Hopkins, Neville McNeill, William D. Drury, Andrew Atkins

EF-006718 Structure and Dynamics Laboratory Testing of an Indirectly Controlled Full Variable Valve Train for Camless Engines
Leander Behre, Theo Van Niekerk, Paolo Mercorelli, Oleg Sergiyenko, Lars Lindner, Julio Julio Rodriguez Quinonez

EF-00677 Secure vehicle location-sharing for trajectory-based message delivery on vanets
Youngho Park, Chul Sur, Si-Wan Noh, Kyung-Hyune Rhee

TU3 - Carrick 3 (1C-3) - 16:10-18:10

Chairs: João Martins and Maher Al-Greer

SS05 - New Era of Smart Grids The Role of Smart Meters

EF-013684 Towards the use of Unbundle Smart Meter for Advanced Inverters Integration
Vasco Delgado-Gomes, João F. Martins, Celson Lima, Paul N. Borza

EF-010014 Using Smart Meters Data for Energy Management Operations and Power Quality Monitoring in a Microgrid
Emilio J. Palacios-Garcia, Enrique Rodriguez-Diaz, Amjad Anvari-Moghaddam, Mehdi Savaghebi, Juan C. Vasquez, Josep M. Guerrero, Antonio Moreno-Munoz

EF-002461 Democratisation of the SmartGrid and the Active Participation of Prosumers
Jeremy Pitt, Ada Diaconescu, Aikaterini Bourazeri

EF-007188 Enhancing the Provision of Ancillary Services from Storage Systems using Smart Transformer and Smart Meters
Fabrizio Sossan, Konstantina Christakou, Mario Paolone, Xiang Gao, Marco Liserre

T3 - Control Systems and Applications

EF-002186 Hardware/Software Co-design Techniques for Compass Search Self-Tuning PID Controller in DC Drive Applications.
Nawfal Al-Saaty, Maher AL-Greer, Matthew Armstrong

EF-002399 Comprehensive Library of Digital Fuzzy PID Control Structures for Power Electronic Systems
Maher AL-Greer, Matthew Armstrong, Volker Pickert

TU3 - Harris 1 (1H-1) - 16:10-18:10

Chairs: Peter Korondi and Kiyoshi Ohishi

T6 - Mechatronics and Robotics

EF-003379 Tensor Product-Based Model Transformation for Position Control of Magnetic Levitation Systems
Elena-Lorena Hedrea, Claudia-Adina Bojan-Dragos, Radu-Emil Precup, Raul-Cristian Roman, Emil M. Petriu, Ciprian Hedrea

EF-000493 A nonlinear optimal control method for autonomous submarines' diving
Gerasimos Rigatos, Pierluigi Siano, Farouk Zouari, Sul Ademi

EF-009881 Unmanned Aircraft System Coordination for Persistent Surveillance with Different Priorities
Luis Silva, Ricardo Bernardo, Hugo Oliveira, Paulo Rosa

EF-003328 Network-based control for a system with long time delay and packet losses
Tooru Suhara, Hiromu Norizuki, Yutaka Uchimura

EF-010758 Knowledge-Based System for Autonomous Control of Intelligent Mastication Robots
Ramin Odisho, Weiliang Xu, John Bronlund, Marie-Agnes Peyron

EF-004944 Fine Vibration Suppression Control Based on New Two-inertia State Observer Feedback Against Three-inertia Robot Joint
Akinori Yabuki, Kiyoshi Ohishi, Toshimasa Miyazaki, Yuki Yokokura

TU3 - Harris 2 (1H-2) - 16:10-18:10

Chairs: Valeriy Vyatkin and Majeed Soufian

T7 - Factory Automation and Industrial Informatics

EF-003719 Flow Control in Wireless Networked Control Systems: A Dead-beat Disturbance Observer Approach
Lorinc Marton, Tamas Vajda

EF-006874 Cyber-physical Production Systems' Design Challenges
Luis Ribeiro

EF-008486 On Development of Execution Models for Model Transforming Distributed Substation Automation Control with Ontology
Chen-Wei Yang, Valeriy Vyatkin, Victor Dubinin

SS14 - Signal and Power Automation Design for Communication Systems

EF-008419 Analysis of Linear Predictive Coefficients for Gunshot Detection Based on Neural Networks
Martin Hrabina

SS10 - Industrial Automation and Process System's Security

EF-002097 Feature Selection in UNSW-NB15 and KDDCUP'99 datasets
Tharmini Janarthanan, Shahrzad Zargari

EF-013269 Towards Self-Defending Control Systems in Cybersecurity Analysis and Measures in Industrial Automation Systems
Majeed Soufian

TU3 - Fintry Auditorium (3F) - 16:10-18:10

Chairs: Christian Klumpner and Walter Zamboni

T5 - Renewable Electric Energy Conversion, Processing and Storage

EF-011185 Integration of Renewable Energy with Storage System to Single Phase Distribution System
Nupur Saxena, Bhim Singh, Anoop Lal Vyas, Ikhlaq Hussain

EF-009253 Being a Member of an Energy Community: Assessing the Financial Benefits for End-users and Management Authority
Konstantina Panagiotou, Christian Klumpner, Mark Sumner

EF-011258 A Synchronous Generator Based Diesel-PV Hybrid Micro-grid with Power Quality Controller.
Shatakshi Sharma, Ikhlaq Hussain, Bhim Singh, Sukumar Mishra

EF-012424 A Kalman Filter Based Approach to PEM Fuel Cell Fault Detection
Gianluigi Buonocunto, Giovanni Spagnuolo, Walter Zamboni

EF-011177 Energy Management and Control of SECS and BESS Integrated AC Microgrid
Deepu Vijay M, Ikhlaq Hussain, Bhim Singh, G. Bhuvaneswari

EF-009946 Precharge Strategies for Isolated Modular DC-DC Converters Under Two Different Start-Up Conditions
Yi Zhang, Huai Wang, Binbin Li, Dianguo Xu, Frede Blaajerg

TU3 - Pentland Auditorium (3P) - 16:10-18:10

Chairs: Chandan Chakraborty and Remus Teodorescu

T4 - Power Electronics and Energy Conversion

EF-004715 Analysis of impedance and current distributions in parallel IGBT design
Asier Matallana, Jon Andreu, Jose Ignacio Garate, Iñigo Martínez de Alegría, Iñigo Kortabarria

EF-008451 Performance Comparison of Modulators with Balancing Capability for MMC Applications
Laszlo Mathe

EF-001619 Real Time Zero Current Detection with Low Quiescent Current for Synchronous DC-DC Converter
Xianzhi Meng, Kexu Sun, Jianxiong Xi, Lenian He

EF-009806 Hybrid Magnetic Design
Wai Keung Mo, Kasper M Paasch

EF-001856 Control Scheme for a Cascaded Multilevel Converter Used in Low-Voltage-Ride-Through Tests of Grid-Connected Wind Turbines
Fernanda Carnielutti, Benhur Tessele, Jean de Paris, Jorge Massing, Humberto Pinheiro

EF-004626 Control Scheme for a Multiple-Output DC/DC Current Source Parallel Resonant Converter
Mohammad Moradi Ghahderijani, Miguel Castilla, Jaume Miret Tomàs, Ramón Guzmán, Juan Manuel Rey

TU3 - Sidlaw Auditorium (3S) - 16:10-18:10

Chairs: Chengbin Ma and Joel Prieto

T4 - Power Electronics and Energy Conversion

EF-008184 Behavior of the Flying Capacitor Converter Under Critical Operating Conditions
Panteleimon Papamanolis, Dominik Neumayr, Johann W. Kolar

EF-006068 Optimal Design of Megahertz Wireless Power Transfer Systems for Biomedical Implants
Siyu Peng, Ming Liu, Zefan Tang, Chengbin Ma

EF-013226 Synchronized SVPWM techniques for Five-Phase Drives
Joel Prieto, José A. Riveros, Hugo Guzman Jimenez

EF-013242 Multifrequency Space Vector Pulse Width Modulation for Asymmetrical Six-Phase Drives
Jose A. Riveros, Joel Prieto, Hugo Guzman Jimenez

SS19 - Resilient Renewable Energy & Storage Systems

EF-013285 Three-phase four-switch inverter fed IPMSM initial position estimation based on HF method
Jiadong Lu, Jinglin Liu, Yihua Hu, Kai Ni, Sen Song

T2 - Electrical Machines and Industrial Drives

EF-011789 Improvement in Torque Profile of Switched Reluctance Motors
Marcio L. M. , Pedro E. M. J. Ribeiro, Luiz Eduardo B. Silva, João Onofre P. Pinto, Darizon A. Andrade, Babak Fahimi, Burak Ozpineci, Morgan Kiani

TU3 - Ochil 2 (1O-2) - 16:10-18:10

Chairs: Marek Jasinski and Razvan-Ioan Dinita

IEEE IES SPTA Recipients and 3Ms Presentations

EF-009954 Morcos Metry, Texas A&M University

EF-002127 Jiao Jiao, Auburn University, United States

EF-011096 T. Hima Bindu, BITS Pilani Hyderabad Campus, India

EF-012602 Kenji Ogawa, Graduate School of Keio University, Japan

EF-009946 Yi Zhang, Aalborg University, Denmark

EF-006912 Ricardo Hernandez-Vidal, Universidad Tecnica Federico Santa Maria, Chile

EF-003263 Marija Vujacic, University of Bologna, Italy

EF-005657 Stefan Feirer, TU Wien, Austria

EF-004006 Van-Binh Vu, Newcastle University, United Kingdom

EF-013293 Jialin Zhang, Beijing University of Technology, China

Wednesday 21st June - Session 1

WE1 - Kilsyth (0K) - 10:40-12:40

Chairs: Mircea-Bogdan Radac and Changyun Wen

T3 - Control Systems and Applications

EF-007056	Robust Bearing Angle Estimator for Low-Cost 1-Axis Gimballed Ultrasonic Seeker *Ui-Suk Suh, Yunha Lee, Won-Sang Ra*
EF-003875	Anti-lock Braking Systems Data-Driven Control Using Q-Learning *Mircea-Bogdan Radac, Radu-Emil Precup, Raul-Cristian Roman*
EF-012637	Parking of Nonholonomic Mobile Robots via Switched Control in the Discrete Time Domain *Zhengguo Li, Ying Zou, Changyun Wen*
EF-001007	Lateral Position Control for a Tractor-trailer System Using Steering Rate Input *Tong Wu, John Y. Hung*
EF-001228	Simple Adaptive Robust Output Tracking Controllers for Uncertain Nonlinear Time-Delay Systems with Dead-Zone Input *Hansheng Wu*
EF-006394	Advanced Process Control for energy efficiency increase in a walking beam reheating furnace *Silvia Maria Zanoli, Crescenzo Pepe, Luca Barboni, Francesco Cocchioni*

WE1 - Moorfoot (0M) - 10:40-12:40

Chairs: Ying-Yu Tzou and Anton Tamas

T2 - Electrical Machines and Industrial Drives

EF-004642	Comparison between linear- and nonlinear-feedback control for a synchronous reluctance machine *Anton Tamas, Simon Wiedemann, Claudia Martis, Ralph Kennel*
EF-011096	Simplified Predictive Torque Control of an IM drive with Efficient Zero Vector Placement *T. Hima Bindu, A. V. Ravi Teja, G. Bhuvaneswari, Bhim Singh*
EF-011118	Predictive Torque Control of a Three-level Reduced Switch Inverter fed Induction Motor Drive *T. Hima Bindu, A. V. Ravi Teja, G. Bhuvaneswari, Bhim Singh*
EF-005096	Asymmetrical Two-Phase Induction Motor Speed Controlled by Multilevel Inverter Employing Cascaded Transformers *Vittaya Tipsuwanporn, Khomkrit Kaenthong, Arjin Numsomran, Anuchit Charean, Winyu Sawaengsinkasikit*
EF-006599	PFC Control of Electrolytic Capacitor-less PMSM Drives for Home Appliances *Jen-Hau Tau, Ying-Yu Tzou*
EF-012262	DC Link Capacitor Optimization for Integrated Modular Motor Drives *Mesut Ugur, Ozan Keysan*

WE1 - Tinto (OT) - 10:40-12:40

Chairs: Ileana-Diana Nicolae and Xinghuo Yu

T1 - Power Systems and Smart Grids

EF-004634 Voltage Sag Mitigation in a PV-Based Industrial Microgrid During Grid Faults
Mohammad Moradi Ghahderijani, Miguel Castilla, Luís García de Vicuña, Antonio Camacho, Javier Torres Martínez

EF-003026 Technical and Economic Model of Energy Transmission and Distribution Based on the Smart Metering Technologies
Andrey V. Pazderin, Andrey A. Pazderin, Nikita D. Mukhlynin

EF-011525 Dealing with Noise Polluting Electric Signals Acquired from a Large Power Group
Ileana-Diana Nicolae, Petre-Marian Nicolae, Radu-Florin Marinescu

EF-005622 Identifying Vulnerabilities in Smart Grid Communication Networks of Electrical Substations using GEESE 2.0
Julia Noce, Yona Lopes, Natalia Fernandes, Célio Albuquerque, Débora Muchaluat-Saade

EF-012009 Shunt Active Power Filter for Energy Quality Improvement in Distributed Generation Systems
Aglailson Olivindo, Isaac Machado

EF-011037 A Multi-agent Simulation Framework for Distributed Generation with Battery Storage
Wei Peng, Peter Sokolowski, Ragini Patel, Xinghuo Yu, Damminda Alahakoon

WE1 - Carrick 1 (1C-1) - 10:40-12:40

Chairs: Pierluigi Siano and Fengge Zhang

SS12 - Advances in nonlinear control for power generation

EF-000507 A nonlinear H-infinity approach to optimal control of PEM fuel cell
Gerasimos Rigatos, Pierluigi Siano, Sul Ademi, Patrice Wira, Maria Carmen Falvo

EF-000515 Flatness-based adaptive fuzzy control of brushless doubly-fed reluctance machines
Gerasimos Rigatos, Pierluigi Siano, Sul Ademi

EF-000647 Kalman Filtering and statistical decision making for detection of attacks against power grid sensors
Gerasimos Rigatos, Demetrios Serpanos, Nikoloas Zervos, Pierluigi Siano

EF-000655 Distributed Filtering and local statistical approach to fault diagnosis for securing the power grid
Gerasimos Rigatos, Demetrios Serpanos, Nikoloas Zervos, Pierluigi Siano

EF-002542 A Novel Direct Power Control for Open-winding Brushless Doubly-fed Reluctance Generators Fed by Dual Two-level Converters Using a Common DC Bus
Liancheng Zhu, Fengge Zhang, Shi Jin, Siyang Yu, Sul Ademi, Wenping Cao

T4 - Power Electronics and Energy Conversion

EF-004731 Fast Pre-charge Strategy of a Modified MMC with Enhanced DC Fault Ride-through Capability
Dongye Li, Yichao Sun, Jianfeng Zhao, Zhendong Ji

WE1 - Carrick 2 (1C-2) - 10:40-12:40

Chairs: Oleg Sergiyenko and Julio C. Rodriguez-Quiñonez

SS01 - Machine vision, control and navigation

EF-000663 A Methodological use of Inertial Navigation Systems for Strapdown Navigation task.
Moises J. Castro-Toscano, Julio C. Rodríguez-Quiñonez, Daniel Hernández-Balbuena, Lars Linder, Oleg Sergiyenko, Moises Rivas-Lopez, Wendy Flores-Fuentes

EF-002275 Virtual Angle Measurement through an FPGA Data Processing
Wendy Flores-Fuentes, Daniel Hernández-Balbuena, Julio C. Rodríguez-Quiñonez, Moisés Rivas-López, Oleg Sergiyenko, Lars Lindner, Felix F. González-Navarro, Jesús E. Miranda-Vega

EF-006157 A Vision System for Traffic Sign Detection and Recognition
Jian-He Shi, Huei-Yung Lin

EF-000469 Machine Vision System Errors for Unmanned Aerial Vehicle Navigation
Lars Lindner, Oleg Sergiyenko, Moisés Rivas-López, Mykhailo Ivanov, Julio Rodríguez-Quiñonez, Daniel Hernández-Balbuena, Wendy Flores-Fuentes, Vera Tyrsa, Fabian Muerrieta-Rico, Paolo Mercorelli

EF-006785 Optimal Trajectory Generation using MPC in Robotino and its Implementation with ROS System
Paolo Mercorelli, Oleg Sergiyenko, Lars Lindner, Thomas Voss, Daniel Strassberger

EF-002496 Object-Oriented Logic Programming of 3D Intelligent Video Surveillance: The Problem Statement
Alexei Morozov, Olga Sushkova, Alexander Polupanov

WE1 - Carrick 3 (1C-3) - 10:40-12:40

Chairs: Antonio J. Marques Cardoso and Majeed Soufian

SS08 - Fault Diagnosis and Fault Tolerance in Power Electronics and Drives

EF-006351 Analysis of Voltage Source Converters Under DC Line-to-Line Short-Circuit Fault Conditions
Mahmood Alwash, Mark Sweet, E.M.S. Narayanan

EF-006408 Binary Feature Selection Classifier Ensemble for Fault Diagnosis of Submersible Motor Pump
Francisco de Assis Boldt, Thomas Walter Rauber, Thiago Oliveira-Santos, Alexandre Rodrigues, Flávio Miguel Varejão, Marcos Pellegrini Ribeiro

EF-008664 Reliability of Induction Machines: Statistics, Tendencies, and Perspectives
Jörg Kammermann, Igor Bolvashenkov, Stefan Schwimmbeck, Hans-Georg Herzog

EF-006238 Modelling of Power Electronics Converters by using the Incidence Matrix Approach
Jaka Marguč, Mitja Truntič, Miran Rodič, Miro Milanovič

EF-008907 DSP-Based Adaptive Angular-Velocity VKF Order Tracking for Online Real-Time Monitoring System
Ting-Chi Yeh, Min-Chun Pan, Cheng-Yi Ho

EF-011959 Fault Detection Observer of a Pilot Plant Papermaking Machine
Majeed Soufian, Majid Borairi, Dingli Yu

WE1 - Harris 1 (1H-1) - 10:40-12:40

Chairs: Hadi Kanaan and Yihua Hu

SS04 - Advanced Power Electronics for Power Quality in Distributed Power Systems

EF-010413 MPC based on balanced positive-sequence extraction strategy for grid-tied converter control
Anthony Kanaan, Fadia Sebaaly, Hadi Y. Kanaan

EF-010626 New Voltage Vector Generation Method for a MPC Algorithm with Constant Switching Frequency Operation
Fadia Sebaaly, Hadi Kanaan

EF-006181 Series transistor array based linear AC regulator: Role of multiple buck-boost transformers in efficiency improvements.
Priyanwada Nimesha Wijesooriya, Nihal Kularatna, Jayathu Fernando, Alistair Steyn-Ross

SS19 - Resilient Renewable Energy & Storage Systems

EF-004529 A Flexible Distributed Approach to Energy Management of an Isolated Microgrid
Songyang Han, He Yin, Amro Alsabbagh, Chengbin Ma

EF-010219 Li-ion Battery Parameter Identification with Low Pass Filter for Measurement Noise Rejection
Cong Sheng Huang, Tommy Wai-Shing Chow, Mo-Yuen Chow

EF-010006 A Statistical Approach for Resilience Analysis of ESS Deployment in RES-based Power Systems
Mario Mureddu, Alfonso Damiano

WE1 - Harris 2 (1H-2) - 10:40-12:40

Chairs: Gerhard Zucker and Milos Manic

T12 - Building Automation, Control and Management

EF-007544 Intelligent Fault Management System for Wireless Sensor Networks with Reduction of Power Consumption
Túlio P. Vieira, Paulo E. M. Almeida, Magali R. G. Meireles

EF-012785 Further Optimization on Type II Terminal Unit in Active Chilled Beam System
Zheming Guan, Changyun Wen

EF-005541 Evaluation of Meta-heuristic Optimization Methods for Home Energy Management Applications
Cristina Guzman, Alben Cardenas, Kodjo Agbossou

EF-004499 Time-series decomposition of power demand data to extract uncertain features
Tomoya Imanishi, Masahiro Yoshida, Janaka Wijekoon, Hiroaki Nishi

EF-009016 Towards a comprehensive life cycle approach of building automation systems
Matthias Lehmann, Jörg Andreas, Tuan Linh Mai, Klaus Kabitzsch

EF-013811 Deep Neural Networks for Energy Load Forecasting
Kasun Amarasinghe, Daniel Marino, Milos Manic

WE1 - Fintry Auditorium (3F) - 10:40-12:40

Chairs: Giovanni Spagnuolo and Kamal Al-Haddad

T5 - Renewable Electric Energy Conversion, Processing and Storage

EF-006912 Sub-Module Photovoltaic Microinverter with Cascaded Flybacks and Unfolding H-bridge Inverter
Ricardo Hernandez-Vidal, Hugues Renaudineau, Samir Kouro

EF-009733 Ultracapacitor Storage Enabled Global MPPT for Photovoltaic Central Inverters
Nicolas Muller, Hugues Renaudineau, Freddy Flores-Bahamonde, Samir Kouro, Patrick Wheeler

EF-005673 FPGA implementation of the EIS technique for the on-line diagnosis of Fuel-Cell systems
Patrizio Manganiello, Giovanni Petrone, Marco Giannatasio, Eric Monmasson, Giovanni Spagnuolo

EF-010308 Simulation of Sun Tracking System for Point Focus Fresnel Collector
Arslan Rizvi, Hadeed Sher, Khaled Addoweesh, Abdelrahman El-Leathy, Hany Al-Ansary, Kamal Al-Haddad

T4 - Power Electronics and Energy Conversion

EF-009504 Stability Analysis of the Slip Mode Frequency Shift Islanding Detection in Single Phase PV Inverters
Bahador Mohammadpour, Milad Zareie, Suzan Eren, Majid Pahlevani

SS21 - Control and Management of local networks with energy storage

EF-006319 Simulation Of A Wind Diesel Power System With Flywheel Energy Storage
Rafael Sebastián, Rafael Peña-Alzola, Jeronimo Quesada

WE1 - Pentland Auditorium (3P) - 10:40-12:40

Chairs: Leila Parsa and Ioan Serban

T4 - Power Electronics and Energy Conversion

EF-005819 Design and Implementation of a Photovoltaic System for Artificial Satellites with Regulated DC Bus
Rodrigo Faria, Caio Gouvea, Joao Castro, Ronilson Rocha

EF-006262 Power management of the DC bus connected converters in a hybrid microgrid tied to the main grid
Robert Salas-Puente, Silvia Marzal, Raul Gonzalez-Medina, Emilio Figueres, Gabriel Garcerá

EF-011061 Control Strategy Aiming at Increasing The Dynamic Response Capability of Autonomous Microgrids
Ioan Serban, Catalin-Petrea Ion

EF-011495 Performance Improvement of Grid Interfaced Three Level Diode Clamped Inverter Under Various Power Quality Events
Amardeep B. Shitole, Hiralal M. Suryawanshi, Girish Gowd Talapur, Shelas Sathyan

EF-003107 Unified Control Design Approach Applied to Four-Wire Shunt Active Power Filter Topologies
Vinicius Bacon, Sergio Silva

EF-012017 Three-phase Current-fed Soft-switching DC-DC Converter
Rohit Suryadevara, Tao Li, Kumar Modepalli, Leila Parsa

WE1 - Sidlaw Auditorium (3S) - 10:40-12:40

Chairs: Lajos Török and Javier Vázquez

T4 - Power Electronics and Energy Conversion

EF-003069 An Integrated Design of Power Converters for Electric Vehicles
Hao Ma, Yuan Tan, Li Du

EF-002992 Novel Approach Employing Buck-Boost Converter as DC-Link Modulator and Inverter as AC-Chopper for Induction Motor Drive Applications: An Alternative to Conventional AC-DC-AC Scheme
Dr P N Tekwani, Vidhi Manilal Patel

EF-010561 Stability Analysis of a Three-Phase Grid-Connected DC Power Supply with Small DC-Link Capacitor and Voltage FeEF-Forward Compensation
Lajos Török, Laszlo Mathe

EF-005681 Nodal-Reduced Modeling of Three-Phase Dual-Active Bridge Converters for EMTP-type Simulations
Robert Uhl, Amir Arasteh, Antonello Monti, Arne Hinz, Rik W. De Doncker

EF-001651 Coupling factor of a weak inductive coupling in a 2-kW power transfer system with a 125-mm air gap for electric vehicle chargers
Javier Vázquez, Pedro Roncero-Sánchez, Alfonso Parreño

EF-004006 A Multi-Output Capacitive Charger for Electric Vehicles
Van-Binh Vu, Luqman Bin Mohamad Kamal, Jasper Tay, Volker Pickert, Mohamed *Dahidah, Thillainathan Logenthiran, Van-Tung Phan*

Wednesday 21st June - Session 2

WE2 - Kilsyth (OK) - 13:40-15:40

Chairs: Kiyoshi Ohishi and Seiichiro Katsura

T3 - Control Systems and Applications

EF-004677 Determination of optimum high-side pressure of R744 automotive heat pump using Fibonacci search method
Jan Glos, Frantisek Solc

SS13 - Integrated Design of Sensing and Actuation for Human Support Applications

EF-006742 GaN-HEMT-Based Three Level T-type NPC Inverter Using Reverse-Conducting Mode in Rectifying
Hiroki Kurumatani, Seiichiro Katsura

EF-011088 Bilateral Control with Compliant Force Lock for Safety Enhancement
R.M. Maheshi Ruwanthika, A.M. Harsha S. Abeykoon, Seiichiro Katsura

EF-007595 Kalman Filter based Fine Force Sensation with Periodic Component Extraction
Thao Tran Phuong, Kiyoshi Ohishi, Yuki Yokokura

EF-007862 Completed Hardware Design and Controller of the Robotic Cane Using the Inverted Pendulum for Walking Assistance
Phi Van Lam, Fujimoto Yasutaka

EF-013382 Variable Compliance Control for Transfer Support Robot
Kouta Yokoyama, Tomoyuki Shimono, Takahiro Mizoguchi, Kohei Ohnishi, Andrea Zignoli

WE2 - Moorfoot (OM) - 13:40-15:40

Chairs: Morgan Kiani and Chris Macnab

T2 - Electrical Machines and Industrial Drives

EF-009458 PM-Assist Double Stator Synchronous Machine
Morgan Kiani, Wei Wang, Lei Gu, Babak Fahimi

EF-010138 Single Position Loop Control Strategy for High-Speed Voice Coil Motor Based on Active Disturbance Rejection Control
Zhongxu Wang, Huai Wang, Yong Li, Frede Blaabjerg

EF-013412 Encoderless Self-Commissioning and Identification of Synchronous Reluctance Machines at Standstill
Simon Wiedemann, Ralph Kennel

EF-001945 A New Efficient Sensorless I/f Control Method for IPMSM Drives
Hanlin Shen, Chengwei Zhang

EF-007722 Comparison of Two Linear Hybrid Excitation Flux Reversal Machines With Different Permanent-Magnet Arrays
Liang Xu, Guohai Liu, Wenxiang Zhao, Jinghua Ji, Qian Chen

T6 - Mechatronics and Robotics

EF-005754 Experimental Evaluation of Adaptive CMAC Haptic Control for Teleoperation of Compliant-Joint Manipulators
Rachael L'Orsa, Chris Macnab

WE2 - Tinto (0T) - 13:40-15:40

Chairs: Jose Luiz Pereira and Men-Shen Tsai

T1 - Power Systems and Smart Grids

EF-006424 Voltage Sag Detection Methods based on Synchronized Phasor Measurements using RTDS
Matheus P. Antunes, Igor D. Melo, José L.R. Pereira, Matheus A. Souza, Nathan L. Silva

EF-010685 Study on Operating Performance of Transformer and Scaling Model with DC Bias
Jiantao Sun, Jinzhong Li, Ke Wang, Chao Wu, Yuzhou Qiu, Xinru Yu

EF-006033 Impact Simulation of PEV Parking Lots to Power Distribution Systems
Yen-Chih Yeh, Men-Shen Tsai

EF-007447 A*-Based Optimal Coordination of Vehicle-to-Grid Batteries and Renewable Generators in A Distribution Network
Lu Wang, Suleiman Sharkh, Andy Chipperfield

EF-009539 Smart Grid Architecture Model Standardization and the Applicability of Domain Language Specific Modeling Tools
Stefan Wilker, Marcus Meisel, Thilo Sauter

T12 - Building Automation, Control and Management

EF-010596 A Novel Smart Meter Controlling System with Dynamic IP Addresses
Pinrolinvic Manembu, Brammy Welang, Aditya Lapu, Angreine Kewo, Per Sieverts Nielsen, Xiufeng Liu

WE2 - Carrick 1 (1C-1) - 13:40-15:40

Chairs: Jeannette Chin and Gerhard Hancke

SS18 - IoT Technology for Reliable User-Centric Sensing and Healthcare Applications

EF-010529 Autonomous Monitoring System for a Public Residential Street
Lucas Phasawana, Gerhard Hancke, Tsotsope Ramotsoela

EF-010324 A solar-powered fish pond management system for fish farming conservation
Christiaan Fourie, Deep Bhatt, Bruno Silva, Anuj Kumar, Gerhard Hancke

EF-010634 Understanding and Personalising Smart City Services Using Machine Learning, the Internet-of-Things and Big Data
Jeannette Chin, Vic Callaghan, Ivan Lam

EF-010189 Behavioural sensor data as randomness source for IoT devices
Lavinia Mihaela Dinca, Gerhard Hancke

EF-009628 Activity and Health Status Monitoring System
Stefan Oniga, Alin Tisan, Robert Bolyi

T9 - Computational Intelligence. Image Processing

EF-003417 Case-Based Reasoning Approach Applied to Surveillance System Using an Autonomous Unmanned Aerial Vehicle
Milena Pinto, Aurelio Melo, Andre Marcato, Cristina Urdiales

WE2 - Carrick 2 (1C-2) - 13:40-15:40

Chairs: Oleg Sergiyenko and Julio C. Rodriguez-Quiñonez

SS01 - Machine vision, control and navigation

EF-003212 Accuracy Improvement in 3D Laser Scanner Based on Dynamic Triangulation For Autonomous Navigation System
Oscar Real-Moreno, Julio C. Rodriguez-Quiñonez, Oleg Sergiyenko, Luis C. Basaca-Preciado, Daniel Hernandez-Balbuena, Moises Rivas-Lopez, Wendy Flores-Fuentes

EF-005649 Follow Me: A Simple Approach for Person Identification and Tracking
Sarah Wunderlich, Johannes Schmölz, Kolja Kühnlenz

EF-005002 Optimal Color Space based Probabilistic Foreground Detector for Video Surveillance Systems
Ajmal Shahbaz, Danilo Caceres Hernandez, Kang-Hyun Jo

EF-012505 Machine Vision System to Measuring the Velocity Field in a Fluid by Particle Image Velocimetry
Monica Valenzuela-Delgado, Wendy Flores-Fuentes, Miguel Bravo-Zanoguera, Alejandro Ortiz_Perez, Daniel Hernandez-Balbuena, Moises Rivas-Lopez, Oleg Sergiyenko, Fernando Gonzalez-Navarro

EF-005258 Multi-source Data Collection for State-of-the-art Data Analysis from Ground-proximate Images in Sea Ice Classification
Lucas Woltmann, Rune Dalmo, Raymond Kristiansen

SS17 - Technology Design on Human Factors

EF-008516 Development of a wireless wearable electrooculogram recorder for IoT-based applications
Suvodip Chakraborty, Anirban Dasgupta, Punyashlok Dash, Aurobinda Routray

WE2 - Carrick 3 (1C-3) - 13:40-15:40

Chairs: Antonio J. Marques Cardoso and Daisuke Chugo

SS08 - Fault Diagnosis and Fault Tolerance in Power Electronics and Drives

EF-012092 IGBT Open-Circuit Fault Diagnosis Based on the Voltage Estimation in the Line-Side AC/DC Converter
Piotr Sobanski, Teresa Orlowska-Kowalska

EF-010464 Fault Tolerant Sliding Mode Direct Torque Control of Induction Motor with Inverter Reconfiguration
Grzegorz Tarchala, Piotr Sobanski, Teresa Orlowska-Kowalska

SS17 - Technology Design on Human Factors

EF-011274 Robots for Older Adults: According to User's Required
Yihsin Ho, Eri sato-Shimokawara, Toru Yamaguchi, Norio Tagawa

EF-010553 Skill Assist System for Musical Instruments by Skilled Players Force Feedback
Kazushige Ashimori, Hiroshi Igarashi

EF-010774 Human-Robots Cooperation through Intelligent Garment
Marie-Pierre Pacaux-Lemoine, Guillaume Tartare, Lydia Habib, Ludovic Koehl, Xianyi Zeng

EF-008001 Control Method of a Personal Vehicle on Cooperation Movement with a Companion Second report:Inducing its Companion to take a Suitable Path for Cooperative Movement
Sho Takagawa, Daisuke Chugo, Satoshi Muramatsu, Hiroshi Hashimoto

WE2 - Harris 1 (1H-1) - 13:40-15:40

Chairs: Ravinder Dahiya and Andrea Fabbri

SS20 - Flexible Electronics: Technologies and Applications

EF-013455 Nanomaterials Processing for Flexible Electronics
Dhayalan Shakthivel, Fengyuan Liu, Carlos Garcia Nuñez, William Taube, Ravinder Dahiya

EF-013463 Hybrid Structure of Stretchable Interconnect for Reliable E-skin Application
Wenting Dang, Leandro Lorenzelli, Vincenzo Vinciguerra, Ravinder Dahiya

EF-013471 Device Modelling of Silicon based High-Performance Flexible Electronics
Shoubhik Gupta, Anastasios Vilouras, Hadi Heidari, Ravinder Dahiya

EF-011428 Logic gates and memory elements design and simulation using PMOS organic transistor
Paolo Branchini, Andrea Fabbri, Domenico Riondino, Luigi Mariucci, Antonio Valletta, Matteo Rapisarda, Alberto Aloisio, Francesco Di Capua

SS17 - Technology Design on Human Factors

EF-011126 SmartFingerBraille:A Tactile Sensing and Actuation based Communication Glove for Deafblind People
Oliver Ozioko, William Taube, Marion Hersh, Ravinder Dahiya

WE2 - Harris 2 (1H-2) - 13:40-15:40

Chairs: Gerhard Zucker and Antonio Martin-Montes

T12 - Building Automation, Control and Management

EF-009822 Easy Provisioning of Building Automation Systems using Visual Light Communication
Lukas Krammer, Daniel Lechner, Felix Knorr, Stephan Cejka

EF-010197 Semi-automated Engineering in Building Automation Systems and Management Integration
Andreas Fernbach, Wolfgang Kastner

EF-009393 Comfort Control in Buildings with Adherence to the Required Thermal Energy Input in Zones
Anita Martincevic, Filip Rukavina, Vinko Lesic, Mario Vasak

EF-009873 Efficient Services in the Industry 4.0 and Intelligent Management Network.
Antonio Martin-Montes, Mauricio Burbano, Carlos León

EF-011843 Automatic Occupancy Prediction Using Unsupervised Learning in Buildings Data
Usman Habib, Gerhard Zucker

EF-008826 Exponential pattern recognition for deriving air change rates from CO2 data
Florian Wenig, Peter Klanatsky, Christian Heschl, Cristinel Mateis, Nickovic Dejan

WE2 - Pentland Auditorium (3P) - 13:40-15:40

Chairs: Mingfei Wu and Ioannis Kypraios

T4 - Power Electronics and Energy Conversion

EF-002879 Design and implementation of ZVZCS in full bridge DC/DC converter with digital control in arc welding machines application
Mingfei Wu, David Flynn, Artur Szymczak

EF-004502 Discharging Scenario of Series Buck-Boost Type Battery Power Modules with Charge Equalization
Tsung-Hsi Wu, Jhih-Kai Wang, Chin-Sien Moo, Yao-Ching Hsieh

EF-013137 A Digital PWM Controlled KY Step-Up Converter Based on Frequency Domain Sigma-Delta ADC
Du Xia, Lam Chi-seng, Sin Sai-Weng, Law Man-Kay, Franco Maloberti, Wong Man-Chung, U Seng-Pan, Martins Rui Paulo

EF-004065 A Novel Adaptive Backstepping Controller for Stabilization of DC/DC Converter Feeding Constant Power Load
Qianwen Xu, Chuanlin Zhang, Changyun Wen, Peng Wang, Meng Yeong Lee

EF-001678 Observer-Based Compensation for Improving Dynamic Response of a Boost PFC Rectifier
Shiang-Hwua Yu, Li-Wen Liu

EF-010316 Multi-Channel Partial Power DC-DC Converter for Current Balancing of LED strings
Jaime Zapata, Thierry Meynard, Samir Kouro

WE2 - Sidlaw Auditorium (3S) - 13:40-15:40

Chairs: Carlo Cecati and Ricardo Nederson do Prado

T4 - Power Electronics and Energy Conversion

EF-002216 Circuit Model and Power Distribution Model of Wireless Power Transfer System in Air
Luo-Na Du, Ke-Han Zhang, Xin-Yi Zhang, Bao-Wei Song, De-Min Xu

EF-013293 Indirect Modulation for Current Source PWM Converter
Jialin Zhang, Yiming Zhang, Dakang Yuan

EF-011134 Graphical THD minimization procedure for single phase five-level converters
Concettina Buccella, Vincenzo Castiglia, Carlo Cecati, M. Gabriella Cimoroni, Rosario Miceli, Giuseppe Schettino

EF-011169 Mixed harmonic elimination and reduction technique for single phase nine level converters
Concettina Buccella, Carlo Cecati, M.Gabriella Cimoroni, Hamed Latafat, Mario Tinari

EF-009075 Proposed Driver with Switched Capacitor to Supply an LED Tubular Lamp
Priscila Bolzan, Paulo Cesar Luz, Igor Barboza, Ricardo Prado

EF-009024 Resonant control applied to LEDs driver bus capacitance reduction
Paulo Cesar Vargas Luz, Ricardo Nederson do Prado, André Luiz Kirsten

WE2 - Fintry Auditorium (3F) - 13:40-15:40

Chairs: Razvan-Ioan Dinita and Domenico Vicinanza

T8 - Electronic Systems-on-Chip and Embedded Systems

EF-011983 Reliability Evaluation of Heterogeneous Systems-on-Chip for Automotive ECUs
Luca Sterpone, Sarah Azimi, Annarita Moramarco

T5 - Renewable Electric Energy Conversion, Processing and Storage

EF-007196 The Output Property of Photovoltaic MS and TCT Configurations under Partially Shaded Conditions
Yunping Wang, Xiaoming Ji, Xinbo Ruan

T3 - Control Systems and Applications

EF-004413 Localization of Omni-wheel Mobile Robot by using Beacon System and Dead Reckoning of Encoder
Jinho Kim, Jongwoo An, Junwoo Song, Jangmyung Lee

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Reviewers

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General Information

Conference Venue

Venue
Edinburgh International Conference Centre
The Exchange
Edinburgh
EH3 8EE

Tel: 0131 300 3000 (From abroad: +44 131 300 3000)
Web: **www.eicc.co.uk**

An accessibility guide for visitors to the EICC is available at: **www.eicc.co.uk/visiting/disability-access**

Wireless Internet Access
Wireless coverage is available throughout the conference centre for all conference delegates, connection is free of charge. Connection details will be provided on the day, please visit the registration desk for further information.

Designated Smoking Areas
Please note the UK smoking policy dictates that you cannot smoke inside buildings. Please observe signs for designated smoking areas.

Conference Registration Information

The registration desk will be open at the following times:

Monday 19th June:	13:00 – 19:30
Tuesday 20th June:	07:30 – 18:30
Wednesday 21st June:	08:00 – 16:30

Delegate badges will be issued with your conference pack. For conference attendance and security purposes it is recommended that these are worn at all times.

Each registered participant will receive one USB stick with a copy of the proceedings along with this conference guide.

Conference Formal Opening & Closure

The formal opening session will take place at 08:40, Tuesday 20th June, in the Pentland Auditorium.
The closing address will take place at 15:40, Wednesday 21st June, in the Fintry Auditorium.

Conference Social & Networking Opportunities

Welcome Drinks Reception
Monday 19th June, 18:30-19:30, Strathblane Hall

The Welcome Drinks Reception is included for all registered delegates, a voucher is included in your conference pack.

Festive Dinner & Dance

Tuesday 20th June, 19:00-22:30, Cromdale Hall

The Festive Dinner is included for all registered delegates, a voucher is included in your conference pack. It may be possible to purchase additional guest tickets, please visit the registration desk for further information.

Lunch Breaks

A light lunch will be offered to registered delegates on Tuesday 20th June and Wednesday 21st June in Strathblane Hall, please refer to the conference schedule for times. Vouchers for each day will be included in the conference pack.

Morning and Afternoon Breaks

Coffee/Tea shall will be offered to registered delegates, please refer to the conference schedule for further information and times.

Travel

Bus, Rail, Tram & Taxi

By Bus

Edinburgh's main bus terminal is located at St Andrews Square. Bus connections stretch right across the UK. For details of these routes please visit: **www.nationalexpress.com** or **www.citylink.co.uk**.

For information on local bus services throughout Edinburgh visit **www.lothianbuses.com**.

By Train

Edinburgh has two railway stations - Waverley and Haymarket. Waverley is the main station and has direct routes to many cities across the country, including over 25 daily departures from London. For more information on the rail network within the UK visit **www.eastcoast.co.uk** or **www.nationalrail.co.uk**.

By Tram

Edinburgh Trams run between the Airport and York Place every 8-10 minutes Monday to Saturday and every 12-15 minutes on a Sunday. The closest tram stop to the EICC is at Haymarket Station. Please visit Edinburgh Trams website for more details, **www.edinburghtrams.com.**

From Edinburgh Airport by Bus

The Airlink 100 operates a frequent bus service (every 10 minutes at peak times) between Edinburgh Airport and the city centre, with designated stops en route. The service starts at 04.30 and runs until 00.22 at night, with the journey taking 20 minutes. Tickets cost £4.50 single and £7.50 return. Delegates are advised to disembark at Haymarket Railway Station and to follow signs for EICC on foot (5 minute walk). See city centre map for directions.

The N22 bus also departs from outside the Airport entrance and runs every half an hour through the night until the Airlink service starts again. For more information about these services visit **www.flybybus.com**.

From Edinburgh Airport by Taxi

There is an excellent taxi service from the airport to the city. You'll find official airport taxis at the taxi rank outside the terminal building (follow the signs within the airport). It costs approximately £15 to get a taxi from the airport to the city centre and the journey takes 20 minutes depending on the time of day.

Tours

We are very pleased to be able to offer an exclusive 15% discount for ISIE delegates on tours in Scotland. This discount is provided by the excellent local Edinburgh tour operator, Rabbie's, and is valid for all tours throughout Scotland between June 5 – July 3, 2017.

For the full range of exciting Scottish tours and to book please visit: **www.rabbies.com/en/scotland-tours** quoting ***ISE1325*** or come and speak to the Rabbie's representative loacted next to the registration desk Monday 19th in the afternoon and Tuesday 20th in the morning.

Helpful Information

Car Parking

There are many car parks in close walking distance to the EICC. Please access the following links for further details:

National Car Parks (NCP) in central Edinburgh - **www.ncp.co.uk**
Sheraton Hotel Car Park located 150 meters from the EICC, with limited accessible parking spaces
Semple Street Car Park located 300 meters from the EICC

Neither the conference centre nor organisers accept responsibility or liability in respect of loss or damage to any property, including motor cars and items left in motor cars.

Conceirge

For first aid, to book a taxi or for any information or services you may need to enjoy the best of Edinburgh please visit the concierge desk located in Strathblane Hall.

Tourist Information

Edinburgh iCentre
3 Princes Street,
Edinburgh,
City Of Edinburgh,
EH2 2QP

Tel: 0131 473 3868
Email: **info@visitscotland.com**
Website: **www.visitscotland.com/destinations-maps/edinburgh/**

Map - Edinburgh City Centre

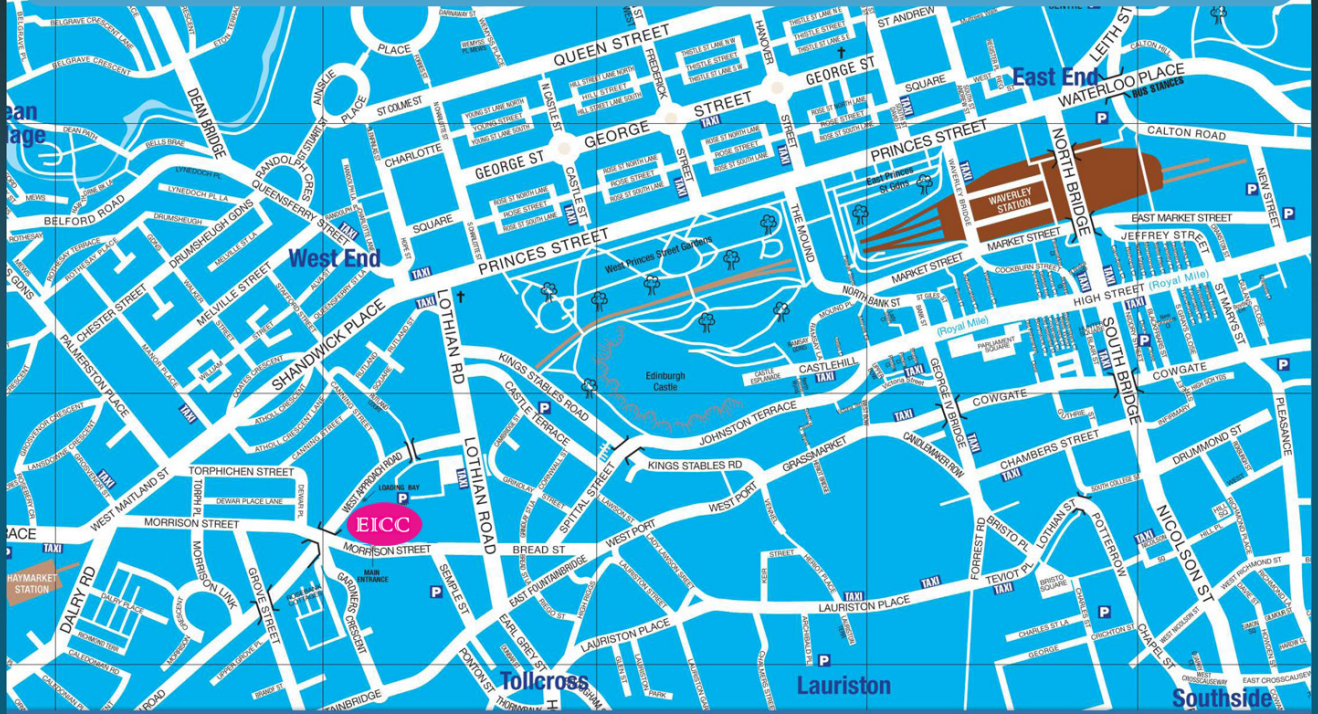
Edinburgh International Conference Centre Ltd

City Centre Map

The main entrance to the EICC is on Morrison Street where there is a coach drop off point. Access to the EICC Loading Bay (deliveries only) is from the West Approach Road.

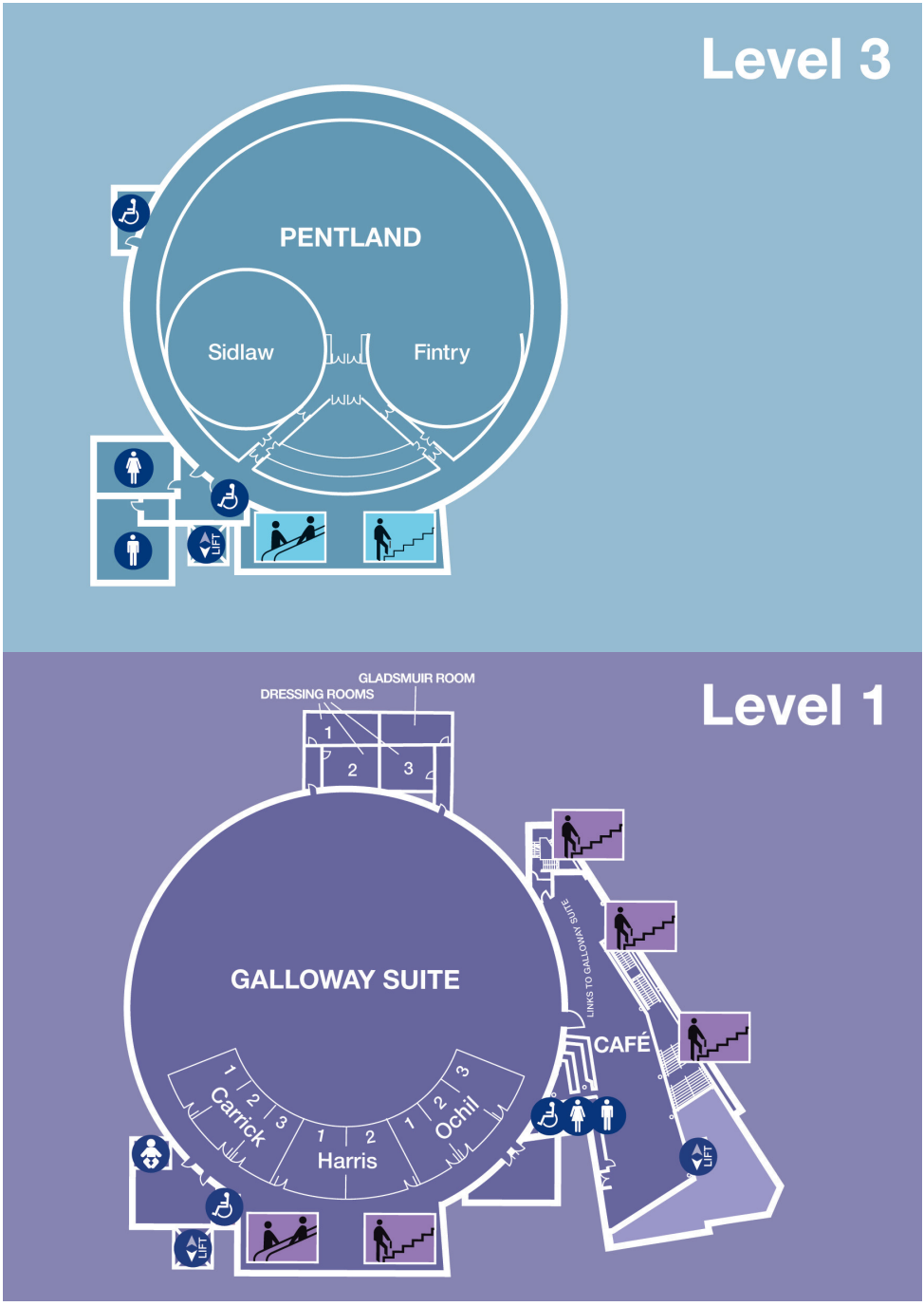
There are a number of car parks within walking distance of the EICC, they are marked on the map. For further details on car parking please visit our website.

Please note that there are a number of one-way streets in close proximity to the EICC. After 18.30 parking is allowed in certain areas.



EICC, The Exchange, Edinburgh EH3 8EE T: +44(0)131 300 3000 F: +44(0)131 300 3030 W: www.eicc.co.uk E: sales@eicc.co.uk

Floor Plans - Edinburgh International Conference Centre




Level 0
LOMOND FOYER
SOUTRA
Moorfoot
Tinto
Kilsyth
LOMOND SUITE
Business Centre
STRATHBLANE HALL
ATRIUM
LIFT
Strathblane Entrance
Atrium Entrance
Level -2
DELIVERY BAYS A & B
DELIVERY BAY C
TURN TABLE ACCESS
CROMDALE HALL
EICC KITCHEN
LENNOX SUITE
1 2 3
Bar
Moffat
1 2
Lammermuir

Notes

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Notes

At a Glance - Technical Programme of the Conference

Room	Monday 19th June			Tuesday 20th June					Wednesday 21st June			
	1300-1400	1400-1630	1700-1820	0840-0910	0910-1030	1050-1250	1350-1550	1610-1810	0900-1020	1040-1240	1340-1540	1540-1610
Strathblane Hall	Registration			Registration					Registration			
Pentland		TUT3	IP	OS	PS	T4	T4	T4	PS	T4	T4	
Sidlaw		TUT1				T4	T4	T4 +SS19 +T2		T4	T4	
Fintry		TUT6				T5	T5	T5		T5+T4 +SS21	T8+T5 +T3	CS
Tinto						T1	T1	T1		T1	T1+T12	
Moorfoot						T2	T2	T2		T2	T2+T6	
Kilsyth						T3	T3	T3		T3	T3+SS13	
Harris 1		TUT5				T6	T6	T6		SS04 + SS19	SS20+SS17 T4	
Harris 2		TUT8				T14+T13 +SS15	T7	T7+SS14 +SS10		T12	T12	
Carrick 1		TUT2				T8	T8+SS18	SS06+T9		SS12+T4	SS18+T9	
Carrick 2		TUT7				T9	SS02+SF	T11		SS01	SS01+SS17	
Carrick 3						SS09+SS21	SS07+SS16	SS05+T3		SS08	SS8+SS17	
Ochil 2						T10	T10+T13					

IP – Industry Panel **OS – Opening Session** **PS – Plenary Session** **CS – Closing Session**

TUT1 Tutorial 1: New Trends in Battery Management Systems for Lithium Ion Batteries
TUT2 Tutorial 2: Tiny Inductively Powered Battery Chargers
TUT3 Tutorial 3: Periodic Control of Power Electronic Converters
TUT4 Tutorial 4: Control Architectures for Power Quality Enhancement in Microgrids
TUT5 Tutorial 5: High-efficiency power conversion with silicon
TUT6 Tutorial 6: Fundamentals, Modulation and Control of MMC
TUT7 Tutorial 7: Design Aspects for Energy Storage Systems
TUT8 Tutorial 8: Smart Open-Source Electronics

T1 Power Systems and Smart Grids
T2 Electrical Machines and Industrial Drives
T3 Control Systems and Applications
T4 Power Electronics and Energy Conversion
T5 Renewable Electric Energy Conversion, Processing and Storage
T6 Mechatronics and Robotics
T7 Factory Automation and Industrial Informatics
T8 Electronic Systems-on-Chip and Embedded Systems
T9 Computational Intelligence. Image Processing
T10 Sensors, Actuators and Micro-Nanotechnology
T11 Automotive Technology
T12 Building Automation, Control and Management
T13 Engineering Education
T14 Entrepreneurship and Management - Challenges for Industrial Electronics
T15 Industrial Cyber-Physical Systems

SS01 Machine vision, control and navigation
SS02 Impedance Source Converters: Control, Improved Topologies, and Emerging Applications
SS03 Building Automation and IoT Applications for Energy Efficiency
SS04 Advanced Power Electronics for Power Quality in Distributed Power Systems
SS05 New Era of Smart Grids: The role of Smart Meters
SS06 Internet of Robots
SS07 New Era of Prosumers: Operation Strategies, Control Algorithms and Power Electronics
SS08 Fault Diagnosis and Fault Tolerance in Power Electronics and Drives
SS09 On-board Micro-grid for the More Electric Aircraft
SS10 Industrial Automation and Process System's Security
SS11 Efficient and Reliable Hybrid and Electric Propulsion Systems
SS12 Advances in nonlinear control for power generation
SS13 Integrated Design of Sensing and Actuation for Human Support Applications
SS14 Signal and Power Automation Design for Communication Systems
SS15 Control Algorithm and Converter Topologies for Energy Efficient Control of AC drives
SS16 Modelling, Analysis, and Management of Hybrid Energy Storage Systems
SS17 Technology Design on Human Factors
SS18 IoT Technology for Reliable User-Centric Sensing and Healthcare Applications
SS19 Resilient Renewable Energy and Storage Systems
SS20 Flexible Electronics: Technologies and Applications
SS21 Control and Management of local networks with energy storage

SF Student Forum

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IET The Institution of Engineering and Technology

Anglia Ruskin University