

Scientific Program

Tuesday, September 11th, 2018

09:00 - 09:20 Opening Session

09:20 - 10:00 Invited Talk 1: *Richard Baraniuk (Rice University, Houston, USA)* - "Data-Driven Computational Sensing"

Chair: Daniel Baumgarten

10:00 - 11:00 Oral Session 1: Theoretical aspects and fundamentals (1) - Regularization techniques

Chairs: Markus Haltmeier, Annelies Coene

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|---------------|--|----|
| 10:00 - 10:20 | Different Regularization Methods for an Inverse Magnetostatic Problem | 47 |
| | <i>Alessandro Formisano, Raffaele Martone</i> | |
| 10:20 - 10:40 | Stable Continuation of Limited View Data in Photoacoustic Tomography | 26 |
| | <i>Florian Dreier, Markus Haltmeier, Sergiy Pereverzyev</i> | |
| 10:40 - 11:00 | Mathematical Analysis of the Inverse Problem of Magnetorelaxometry Imaging | 91 |
| | <i>Janic Föcke, Martin Burger</i> | |

11:00 - 11:30 Coffee Break

11:30 - 12:50 Poster Session 1

Chair: Christian Magele

12:50 - 14:00 Lunch Break

14:00 - 15:00 Oral Session 2: Applications – Transportation and Non-Destructive Evaluation

Chairs: Benoît Delinchant, Valentin Mateev

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| 14:00 - 14:20 | Optimal sizing method with energy management – application to electric hybrid train | 16 |
| | <i>Marie Poline, Laurent Gerbaud, Julien Pouget, Frederic Chauvet, Ali Castaing</i> | |
| 14:20 - 14:40 | Multiobjective optimisation of a Magnetic Gear for powertrain applications | 50 |
| | <i>Vincenzo Cirimele, Maurizio Repetto, Elvio Bonisoli, Luca Dimauro</i> | |
| 14:40 - 15:00 | Single Voxel Boundary Element Source Method: A novel forward solution approach for Lorentz force evaluation | 19 |
| | <i>Eva-Maria Dölker, Bojana Petkovic, Reinhard Schmidt, Hartmut Brauer, Jens Haueisen</i> | |

Wednesday, September 12th, 2018

09:00 - 11:00 Minisymposium: Computational Electromagnetics

Chair: **Markus Clemens**

- 09:00 - 09:30 Multi-Domain Design of Low Frequency Devices in a World of High Performance Computing
David A. Lowther (Mc Gill University, Canada)
- 09:30 - 10:00 State-of-the art and recent developments for sensitivity analysis of electromagnetic problems, in view of shape and topology optimization
Christophe Geuzaine, Erin Kuci (University of Liège, Belgium)
- 10:00 - 10:30 Model order reduction in low frequency computational electromagnetics: methods and applications
Stéphane Clénét (Arts et Métiers ParisTech, France)
- 10:30 - 11:00 What Can Isogeometric Analysis Do For Computational Electromagnetics?
Sebastian Schöps (Technische Universität Darmstadt)
- 11:00 - 11:30 Coffee Break

11:30 - 12:50 Oral Session 3: Optimization Algorithms

Chairs: **Raffaele Martone, Paolo di Barba**

- 11:30 - 11:50 Free-form optimization in industrial dielectric design: a comparative approach 20
Paolo Di Barba, Maria Evelina Mognaschi, Tomasz Nowak, Andreas Blaszczyk, Najmeh Rezaei
- 11:50 - 12:10 Implicit method to find natural switched-off time using genetic algorithm 35
Simon Morel, Lauric Garbuio, Laurent Gerbaud
- 12:10 - 12:30 Efficient surrogate-based optimization using reduced order models by moment matching coupled with kriging 55
Mateus A. O. Leite, Benoit Delinchant, Jean-Michel Guichon, João A. Vasconcelos
- 12:30 - 12:50 Non-Uniformly Spaced Linear Antenna Array Design by Means of PEEC Approach Applying Cheetah Optimization Algorithm 75
Piergiorgio Alotto, Sinvaldo Moreno, Carlos Klein, Viviana Cocco Mariani, Leandro Dos Santos Coelho, Thomas Bauernfeind, P. Baumgartner
- 12:50 - 14:00 Lunch Break

14:00 - 15:30 Poster Session 2

Chair: **Alessandro Formisano**

- 15:30 - 16:00 Coffee Break

16:00 - 17:00 Oral Session 4: Theoretical aspects and fundamentals (2) - Formulation of inverse problems and model order reduction

Chairs: **Jan K. Sykulski, Domenico Lahaye**

- 16:00 - 16:20 A New Inverse Integral Formulation for Thin Regions Magnetization Identification 32
Gireg Chavin-Collin, Bertrand Bannwarth, Didier Cavallera, Olivier Chadebec, Nicolas Galopin, Gerard Meunier, Laure-Line Rouve
- 16:20 - 16:40 Application of Whitney Elements for the Reconstruction of Electric Arc Current Density in Low-voltage Circuit Breakers 42
Jinlong Dong, Luca Di Rienzo, Olivier Chadebec, Jianhua Wang
- 16:40 - 17:00 Fast Computation of Copper and Iron Losses Using Model Order Reduction 53
Shingo Hiruma, Hajime Igarashi

Thursday, September 13th, 2018

09:00 - 09:40 Invited Talk 2: Josep M. Guerrero (Aalborg University, Denmark) - "State of the Art in Microgrid Technology"

Chair: **Bruno Sareni**

09:40 - 11:00 Oral Session 5: Applications – Smart Grids & Electrical Machines

Chairs: **Frédéric Wurtz, Vincenzo Cirimele**

09:40 - 10:00	Optimal sizing of independent renewable energy microgrids	37
	<i>Paolo Di Barba, Juan Manuel Espeche, Maria Evelina Mognaschi</i>	
10:00 - 10:20	Robust energy management optimization of a smart microgrid in day ahead markets	71
	<i>Rémi Bourbon, Bruno Sareni, Xavier Roboam, Sandra-Ulrich Ngueveu</i>	
10:20 - 10:40	3-D Topology Optimization of Magnetic Cores for Wireless Power Transfer with Double-Sided Winding Coils	58
	<i>Yoshitsugu Otomo, Yunyi Gong, Hajime Igarashi</i>	
10:40 - 11:00	Homogenization of Multi-turn Coil with Elliptic Cross Section Using Complex Permeability	65
	<i>Shogo Fujita, Hajime Igarashi</i>	

11:00 - 11:30 Coffee Break

11:30 - 12:50 Oral Session 6: Applications – Biomedical Engineering

Chairs: **Jens Haueisen, Friedrich Hanser**

11:30 - 11:50	Removing redundant information from a magnetic particle imaging system function	23
	<i>Olaf Kosch, Hendrik Paysen, James Wells, Frank Wiekhorst</i>	
11:50 - 12:10	Reconstruction parameter study for functional magnetic particle imaging	40
	<i>Hendrik Paysen, Olaf Kosch, James Wells, Norbert Loewa, Antje Ludwig, Frank Wiekhorst</i>	
12:10 - 12:30	Compressed sensing based excitation and sensitivity-weighted reconstruction for magnetorelaxometry imaging	92
	<i>Peter Schier, Gerhard Zangerl, Maik Liebl, Frank Wiekhorst, Markus Haltmeier, Daniel Baumgarten</i>	
12:30 - 12:50	Tissue mapping for improved multi-colour magnetorelaxometry imaging	15
	<i>Annelies Coene, Jonathan Leliaert, Maik Liebl, Uwe Steinhoff, Frank Wiekhorst, Daniel Baumgarten, Guillaume Crevecoeur, Luc Dupré</i>	
12:50 - 14:00	Lunch Break	

14:00 - 15:30 Poster Session 3

Chair: **David A. Lowther**

15:30 - 16:00 Coffee Break

16:00 - 17:00 Oral Session 7: Theoretical aspects and fundamentals (3) - Identification and design problems, sensitivity analysis

Chair: **Hartmut Brauer**

16:00 - 16:20	Imaginary machine design: proposal of concepts, principles and a methodology as a new paradigm for preliminary design by optimization	67
	<i>Frederic Wurtz, Benoit Delinchant, Laurent Gerbaud, Jean-Luc Schanen, Van Din Binh, Mylène Delhommais, Nicolas Franckmoissonhauser</i>	
16:20 - 16:40	Identifying the design criteria of an old Edison-Hopkins dynamo by means of modern numerical techniques	97
	<i>Paolo Di Barba, Roberto Galdi, Francesco Pietra, Antonio Savini</i>	

16:40 - 17:30 Closing Session