

Vol. 7, No. 2, 2012

TRANSACTIONS ON Systems, Signals and Devices

Issues on Power Electrical Systems

Shaker Verlag
Aachen 2012

Bibliographic information published by the Deutsche Nationalbibliothek

The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available in the internet at <http://dnb.d-nb.de>.

Copyright Shaker Verlag 2012

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior permission of the publishers.

Printed in Germany.

ISBN 978-3-8440-1609-3

ISSN 1861-5252

Shaker Verlag GmbH • P.O. BOX 101818 • D-52018 Aachen

Phone: 0049/2407/9596-0 • Telefax: 0049/2407/9596-9

Internet: www.shaker.de • e-mail: info@shaker.de

Transactions on Systems, Signals & Devices

Editor in Chief: Prof. Hans-Rolf Tränkler
Bundeswehr University, Munich, 85577 Germany.
Email: ima@unibw-muenchen.de

Issues on Systems, Analysis & Automatic Control

Editor in Chief: Prof. Dr.-Eng. Nabil Derbel
Control & Energy Management Laboratory, (CEMLab)
Sfax National Engineering School, University of Sfax,
BP 1173, 3038 Sfax, Tunisia.
Email: nabil.derbel@ieee.org

Issues on Power Electrical Systems

Editor in Chief: Prof. Dr.-Eng. Lotfi Krichen
Control & Energy Management Laboratory, (CEMLab)
Sfax National Engineering School, University of Sfax,
BP 1173, 3038 Sfax, Tunisia.
Email: lotfi.krichen@enis.rnu.tn

Issues on Communication & Signal Processing

Editor in Chief: Prof. Dr.-Eng. Faouzi Derbel
Chair of Smart Diagnostic and Online Monitoring
Leipzig University of Applied Sciences, Germany
Email: derbel@eit.htwk-leipzig.de

Issues on Sensors, Circuits & Instrumentation

Editor in Chief: Prof. Dr.-Eng. Olfa Kanoun
Chair of Measurement and Sensor Technology,
Chemnitz University of Technology,
D- 09107 Chemnitz, Germany.
Email: kanoun@ieee.org

Publishing coordinator: Prof. Dr.-Eng. Moez Feki
Control & Energy Management Laboratory, (CEMLab)
Sfax National Engineering School, University of Sfax,
BP 1173, 3038 Sfax, Tunisia.
Email: Moez.Feki@enig.rnu.tn

Transactions on Systems, Signals & Devices

Issues on Power Electrical Systems

Issues on Power Electrical Systems

Editor in Chief:

Prof. Dr.-Eng. Ahmed Masmoudi

Research unit on Renewable Energies & Electric Vehicles (RELEV)

Sfax National Engineering School, University of Sfax,

BP 1173, 3038 Sfax, Tunisia.

Email: a.masmoudi@enis.rnu.tn

Editorial Board:

Sylvain Allano	Ecole Normale Supérieure de Cachan - France
Ibrahim Badran	Philadelphia University - Amman - Jordan
Ronnie Belmans	University of Leuven - Belgium
Frdéric Bouillault	University of Paris XI - France
Pascal Brochet	Ecole Centrale de Lille - France
Mohamed Elleuch	Tunis Engineering School, Tunisia
Mohamed B. A. Kamoun	Sfax Engineering School - Tunisia
Mohamed R. Mékidèche	University of Jijel - Algeria
Bernard Multon	Ecole Normale Supérieure de Cachan - France
Francesco Parasiliti	University of L'Aquila - Italy
Manuel Pérez-Donsión	University of Vigo - Spain
Michel Poloujadoff	University of Paris VI - France
Francesco Profumo	Politecnico di Torino - Italy
Alfred Rufer	Ecole Polytech. Fédérale de Lausanne, Switzerland
Junji Tamura	Kitami Institute of Technology - Japan

Transactions on Systems, Signals & Devices

Issues on Systems, Analysis & Automatic Control

Editor in Chief:

Prof. Dr.-Eng. Nabil Derbel
Control & Energy Management Laboratory, (CEMLab)
Sfax National Engineering School, University of Sfax,
BP 1173, 3038 Sfax, Tunisia.
Email: nabil.derbel@ieee.org

Editorial Board:

Dumitru Baleanu	Çankaya University, Ankara - Turkey
Ridha Ben Abdennour	Engineering School of Gabès - Tunisia
Naceur Benhadj-Braïek	ESSTT - Tunis - Tunisia
Mohamed Benrejeb	Engineering School of Tunis - Tunisia
Riccardo Caponetto	Universita' degli Studi di Catania - Italy
Yang Quan Chen	Utah State University - Logan - USA
Mohamed Chtourou	Engineering School of Sfax - Tunisia
Boutaïeb Dahhou	Université Paul Sabatier Toulouse - France
Gérard Favier	Université de Nice - France
Florin G. Filip	The Romanian Academy Bucharest - Romania
Dorin Isoc	Technical University of Cluj Napoca - Romania
Pierre Melchior	Université de Bordeaux - France
Faiçal Mnif	Sultan Kabous University Muscat - Oman
Ahmet B. Özgüler	Bilkent University - Bilkent - Turkey
Manabu Sano	Hiroshima City University - Hiroshima - Japan
J. A. Tenreiro Machado	Institute of Engineering of Porto - Portugal
Alexander Pozniak	Instituto Politecnico - National Mexico
Herbert Werner	University of Technology - Hamburg - German
Ronald R. Yager	Machine Intelligence Inst. Iona College - USA
Blas M. Vinagre	University of Extremadura - Badajoz - Spain
Lotfi Zadeh	University of California - Berkeley, CA, USA

Transactions on Systems, Signals & Devices

Issues on Communication & Signal Processing

Editor in Chief:

Prof. Dr.-Eng. Faouzi Derbel
Chair of Smart Diagnostic and Online Monitoring,
Leipzig University of Applied Sciences, Germany
Email: derbel@eit.htwk-leipzig.de

Editorial Board:

Til Aach	Aachen University, Germany
Kasim Al-Aubidy	Philadelphia University, Amman - Jordan
Adel Alimi	Engineering School of Sfax - Tunisia
Najoua Benamara	Engineering School of Sousse - Tunisia
Ridha Bouallegue	Engineering School of Sousse - Tunisia
Dominique Dallet	ENSEIRB - Bordeaux - France
Mohamed Deriche	King Fahd University, Saoudia Arabia
Khalifa Djemal	Université d'Evry, Val d'Essonne - France
Daniela Dragomirescu	LAAS - CNRS, Toulouse - France
Khalil Drira	LAAS - CNRS, Toulouse - France
Noureddine Ellouze	Engineering School of Tunis - Tunisia
Faouzi Ghorbel	ENSI - Tunis - Tunisia
Karl Holger	University of Paderborn - Germany
Berthold Lankl	University of Bundeswehr - Munich - Germany
George Moschytz	ETH Zürich - Switzerland
Radu Popescu-Zeletin	Fraunhofer Institute Fokus, Berlin - Germany
Basel Solimane	ENST - Bretagne - France
Philippe Vanheegehe	Ecole Centrale de Lille France

Transactions on Systems, Signals & Devices

Issues on Sensors, Circuits & Instrumentation

Editor in Chief:

Prof. Dr.-Eng. Olfa Kanoun
Chair of Measurement and Sensor Technology,
Chemnitz University of Technology,
D- 09107 Chemnitz, Germany.
Email: kanoun@ieee.org

Editorial Board:

Ali Boukabache	Université Paul-Sabatier, Toulouse - France
Georg Brasseur	Graz University of Technology, Austria
Serge Demidenko	Monash University, Selangor - Malaysia
Gerhard Fischerauer	Universität Bayreuth, Bayreuth - Germany
Patrick Garda	Université Pierre et Marie Curie, Paris - France
P. M. B. Silva Girão	Instituto Superior Técnico, Lisboa - Portugal
Voicu Groza	University of Ottawa, Ottawa - Canada
Volker Hans	University of Essen, Germany
Aimé Lay-Ekuakille	Università degli Studi di Lecce, Italy
Mourad Loulou	Engineering School of Sfax, Tunisia
Mohamed Masmoudi	Engineering School of Sfax, Tunisia
S. Mukhopadhyay	Massey University Turitea, New Zealand
Fernando Puente León	Technical University of Munich, Germany
Leonard Reindl	Institut für Mikrosystemtechnik, Freiburg - Germany
Pavel Ripka	Czech Technical University Praha, Czech Republic
Abdulmotaleb El Saddik	SITE, Univ. of Ottawa, Ottawa, Ontario-Canada
Gordon Silverman	Manhattan College Riverdale, NY - USA
Rached Tourki	Faculty of Sciences, Monastir - Tunisia
Bernhard Zagar	Johannes Kepler University of Linz, Austria

Contents

- Low Voltage Ride Through Capability of Grid-Connected High-Power Renewable Energy Systems Employing Unified Power Flow Controller 111
S. Raphael and A. M. Massoud
- AVI Demodulation Schemes for IPMSM Position Estimation at Standstill and Low Speed - A Review 125
O. Bel Hadj Brahim-Kechiche, H. Ben Attia-Sethom, H. Sammoud and I. Slama-Belkhodja
- Supervisory System of Wind Farm when Fluctuating Wind with Small Grid Disturbances 143
S. Skander Mustapha and I. Slama Belkhodja
- Modeling, Control and Power Management of PEMFC-Supercapacitor as a Distributed Generator 163
D. Ketata and L. Krichen
- Load Connection Control in Autonomous Wind Power Generation 177
A. Masmoudi, L. Krichen and A. Ouali
- Investigation of Tariff Initiatives for Peak Load Balancing at the Domestic Level 195
A. M. Ithal, H. S. Rajamani, R.A. Abd-Alhameed and M. K. Jalboub