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Advances in Environmental Technology and Biotechnology

- **Proceedings of the 3rd International Conference on Energy and Environment Technologies and Equipment (EEETE '14)**
- **Proceedings of the 3rd International Conference on Agricultural Science, Biotechnology, Food and Animal Science (ABIFA '14)**

Brasov, Romania, June 26-28, 2014

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Preface

This year the 3rd International Conference on Energy and Environment Technologies and Equipment (EEETE '14) and the 3rd International Conference on Agricultural Science, Biotechnology, Food and Animal Science (ABIFA '14) were held in Brasov, Romania, June 26-28, 2014. The conferences provided a platform to discuss new trends in energy production in classical plants, energy production impact on ecological systems, energy efficiency, energy equipment impact on climate changes, agricultural biotechnology, animal biotechnology, biomedical engineering, biomedical robotics and mechanics, computational evolutionary biology, medical informatics, metabolic modeling and pathways, protein modeling, biosensors and molecular diagnostics, breeding and genetics, cellular and molecular biology, nano biotechnology etc. with participants from all over the world, both from academia and from industry.

Their success is reflected in the papers received, with participants coming from several countries, allowing a real multinational multicultural exchange of experiences and ideas.

The accepted papers of these conferences are published in this Book that will be sent to international indexes. They will be also available in the E-Library of the WSEAS. Extended versions of the best papers will be promoted to many Journals for further evaluation.

Conferences such as these can only succeed as a team effort, so the Editors want to thank the International Scientific Committee and the Reviewers for their excellent work in reviewing the papers as well as their invaluable input and advice.

The Editors

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Keynote Lecture

Contribution to Sustainable Development Education in an Engineering High School: Design of Small Scale "Green House" and Example of Experiments

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Abstract: Since Rio de Janeiro conference (1992), Kyoto protocol and agenda 21 definitions, the necessity of a harmonious development is now admitted by a majority of scientific and political personalities. Even if sustainable development is a complex concept, which concerns a wide range of social, scientific, economical and environmental issues, each of us is able to do something for humanity evolution, in particular in the education field. Thus, our project started through an individual questioning of a few teachers, two years ago: What can we include in our research field and/or pedagogical thematic to have a concrete action in sustainable development, while respecting the mains scientific fields of our engineering school? The "small scale green house" project was born. In this talk, we present the main steps of the model design; According to technical standards, a scaled hand made "green" house was first built with genuine and scaled power plants, others accessories like hydrogen fuel stack, solar tracking system, solar tower were added to make the model realistic and functional for experiments.
Once finished, some concrete and various didactical experiments were performed. We give here example of thermal losses investigations, carbon assessment, and solar tracking system electronic design. The transdisciplinary aspects of this work are highlighted and finally, some future evolutions are suggested.

Brief Biography of the Speaker: Ph. Dondon was born in 1960. He is a graduate from the High School of Electronic Engineers ENSEIRB Bordeaux, France. After his electronic engineer diploma in 1983, he worked 5 years as product manager and computer aided manufacturing (C.A.M) in the French radio-communication systems company T.R.T. Back to the IMS Microelectronic Laboratory of Bordeaux, he received his Ph D in microelectronic analogue design in 1992. He is now teaching electronic at ENSEIRB- MATMECA and has several interests in electronic circuits and electronic for sustainable development fields of research.

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Plenary Lecture 1

Extremum Seeking Control Applied to Different Renewable Energy Sources

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Abstract: In this presentation, a Maximum Power Point Tracking (MPPT) technique is proposed for the different Renewable Energy Source (RES) based on advanced Extremum Seeking (aES) control that slightly improves the performances obtained in comparison with other MPPT control scheme. The analysis made for the aES control scheme reveals interesting relationships in frequency domain to design the control parameters, the values of closed loop gain and the dither amplitude. Thus, the imposed performances related to the search speed and tracking accuracy are easy to be obtained for the ES control based on a band pass filter (BPF) scheme.
The search speed will increase proportionally with the product of both control parameters, so it is practically limited for safe reasons, and the tracking accuracy will be proportional with the magnitude of the first power harmonic, so the power ripple will be negligible after the MPP is caught. Simulations show that the performances mentioned above are effective for the aES control based on BPF scheme, and the dither persistence is improved for the BPF scheme having a large frequencies band that cover at least six harmonics.
As it is known, the P&O method and its improved variants are most used algorithms that are implemented in MPP tracking controllers. The P&O methods are based on periodically changing of the RES operating point, observing the resulting change in the RES power. It is obvious that lower oscillations obtained during the MPPT phase decreases the RES power harvested.
Also, although MPPT control is a well established algorithm, certain instability may appear when the control parameters change rapidly, as happens in the effort to increase the overall RES efficiency applied in the Hybrid Power Sources (HPS) that have implemented a load-following control. Thus, an optimal management of all HPS subsystems to load dynamic is required.

Brief Biography of the Speaker: Nicu BIZON received a five-year degree in electronic engineering from the University “Polytechnic” of Bucharest, Romania, in 1986, and the PhD degree in Automatic Systems and Control from the same university, in 1996. Firstly, he was in hardware design with the Dacia Renault SA, Romania. Currently, he is Professor with the University of Pitesti, Romania, being from 2012 the dean of the Faculty of Electronics, Communication and Computers. Also, he was head of University Research Department (2004-2008) and Executive Director of the Research Centre "Modeling and simulation processes and systems" (2008-2012), being manager of two research project in field of Green and Hydrogen Energy, and team’s member in other four projects in the same research field.
He is editor of six books in field of Green Energy, Hybrid Power Sources and Power Converters. His current research interests include the broad area of nonlinear systems, on both dynamics and control applied in the Green Energy field (www.researcherid.com/rid/B-8523-2011). He was authored or co-authored of several papers (over to 150) in journals (ISI web of knowledge or data base indexed) or international conferences proceedings.
He has expertise in field of renewable energy, being evaluator of Research Projects for FP7 Programme , EVAL-INCO Programme, EACI Programme, NSRF 2007-13 (Greece), NEWFELPRO 2013-17 (Croatia), CNCSIS Ideas and ANCS PN II Programme (Romania).

Authors Index

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