University of Macau
Faculty of Science and Technology

Distinguished Lecture

Title: Training Intelligent Systems with Entropy Concepts: From Wind Power
                    Prediction to Missing Sensor Restoration and Other Applications
Speaker :   Prof. Vladimiro Henrique Barrosa Pinto de Miranda
                    Professor of Faculty of Engineering of University of Porto (FEUP)
                    Fellow of IEEE
Language: English
Date and Time: 21 January 2010 (Thursday), 3:00 p.m.
Venue: HG01, Ho Yin Convention Centre

Abstract

Intelligent systems subject to training try to capture the essential information about a real system behavior, so that this behavior may be reproduced faithfully. It is therefore a problem linked with information theory, and the new perspective is to train such systems, such as neural networks and in general mappers depending on the tuning of parameters, by minimizing the information content of the error distribution instead of minimizing the sum of the square of the errors, which is current and traditional practice. Entropy-related functions introduce metrics in space that allow a natural purging of outliers, when data is contaminated with gross errors or, on the contrary, avoid discarding information about freak events if they are important although extremely rare. This is not achieved with the classical Minimum Square Error criterion. The talk will show modern advances in using concepts such as information entropy and correntropy in problems of 3-day ahead wind power prediction, power system state estimation and missing sensor restoration.

About the speaker

Vladimiro Miranda was born in Porto, Portugal on March 11, 19 graduated in Electrical Engineering in 1977 and received the Ph.D. de Electrical Engineering from FEUP, the Faculty of Engineering of the Unive Porto, Portugal, in 1982.

In 1981 he joined FEUP as a lecturer and currently holds the position of Full Professor (Professor Catedrático). In 1985, he also joined INESC, a top R&D institute in Portugal where he came to be coordinator of the area of Power systems during the 90's.

In 1996 and 1997 he stayed as Visiting Full Professor in the University of Macau, China. At the same time, he was appointed President of the Board of INESC Macau, a joint Portuguese-Chinese R&D institute. Upon returning to Portugal, he became President of the Scientific Council of INESC Porto in 1998 and Director/Member of the Board of INESC Porto, since 2000 to the present day. In 2005 he was again Visiting Professor at the Federal

University of Pará (UFPA), Brazil.

Prof. Miranda has been serving in the Administration Board of spin-off companies created within the INESC system. He has also served as research project evaluator for the governmental science organizations of Portugal, Norway, Croatia, South Africa and Argentina. For the Government of this latter country, he has been acting as external auditor in the process of evaluation of research institutions.

He has been responsible for many research projects at international level, in the European Union, United States and Brazil, and has authored or co-authored over 200 publications, especially in areas related with the application of Computational Intelligence to Power Systems.

Prof. Miranda is an IEEE Fellow.

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