



Cornell University

Information, Systems, and Networks seminar

Beta Wavelet and Wavelet Networks: Theory and Applications

Rhodes Hall 310: April 18, 2012 @ 12:00PM



ISN Seminar Speaker:

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Abstract

After a brief representation of our local IEEE Signal Processing Society chapter events, I will present a part of our research activities related to use of Beta wavelet and wavelet networks in some signal processing applications. In fact, I will try to define a new family of wavelets based on a parametric function called Beta function and its derivatives. This Beta function and its derivatives can approximate many of known wavelets like Haar wavelets, Morlet functions, Gaussian functions, etc. The use of these Beta wavelets will be also improved in other applications as image compression, content based image retrieval and detection of salient points. In the second part of this talk, I will present a new architecture based on Beta wavelet Network (BWN). A BWN combines the advantages of the neural networks in term of universal approximation and learning capacities and those of the Beta wavelets in terms of time-frequency representation, multiresolution analysis and the presence of a large number of control parameters. Some applications will be presented to improve the new architecture as the reconstruction from sampled 1D, 2D and 3D data, approximation of non-analytic wavelets and face classification.

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Biography

Chokri BEN AMAR received the B.S. degree in Electrical Engineering from the National Engineering School of Sfax (ENIS) in 1989, the M.S. and PhD degrees in Computer Engineering from the National Institute of Applied Sciences in Lyon, France, in 1990 and 1994, respectively. He spent one year at the University of “Haute Savoie” (France) as a teaching assistant and researcher before joining the higher School of Sciences and Techniques of Tunis as Assistant Professor in 1995. In 1999, he joined the Sfax University (USS), where he is currently a professor in the Department of Electrical Engineering of the National Engineering School of Sfax (ENIS), and the Vice director of the REsearch Groups on Intelligent Machines (REGIM Laboratory).

His research interests include Computer Vision and Image and video analysis. These research activities are centered on Wavelets and Wavelet networks and their applications to data Classification and approximation, Pattern Recognition and image and video coding, indexing and watermarking. He is a senior member of IEEE, and the chair of the IEEE SPS Tunisia Chapter since 2009. He was the chair of the IEEE NGNS2011 (IEEE Third International Conference on Next Generation Networks and Services) and the Workshop on Intelligent Machines: Theories & Applications (WIMTA 2009), the tutorial chair of the “Traitement et Analyse de l’Information: Méthodes et Applications (TAIMA 2011)” conference and the chair of the organizing committees of TAIMA 2009 conference, International Conference on Machine Intelligence ACIDCA-ICMI’2005 and International Conference on Signals, Circuits and Systems SCS2004.