Eder Santana

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SUMMARY

My research interest is on (unsupervised and supervised) learning temporal patterns using memory augmented recurrent neural networks. Right now, I am applying Neural Turing Machines for video representation and question-answering.

EDUCATION

PhD Electrical and Computer Engineering
University of Florida, Gainesville, FL — 2013-present

Thesis proposal: Long term temporal pattern consolidation for Cognitive Architectures.

MSc Electrical Engineering
Federal University of Maranhao, Sao Luis, Brazil — 2011-2012

Developed algorithms for blind source separation of fetal EEG signals using Kernel Machines
Thesis: Extracting signals with specific temporal structure with Kernel Methods.

BSc Electrical Engineering
Federal University of Maranhao, Sao Luis, Brazil — 2007-2011

Monograph: Blind source extraction .

PUBLICATIONS

Journals:

E Santana, JC Principe, EE Santana, AK Barros, "Extraction of signals with higher order temporal structure using Correntropy", Signal Processing, Vol. 92, No. 8, pp. 1844-1852, Aug. 2012.

E Santana, JC Principe, EE Santana, AK Barros, RCS Freire, "Extraction of signals with specific temporal structure using kernel methods." Signal Processing, IEEE Transactions on 58.10 (2010): 5142-5150

Conferences:

Eder Santana, G. T. Cinar and JC. Principe, "Parallel flow in Deep Predictive Coding Networks," Intl. Joint Conf. on Neural Networks 2015.

Eder Santana, JC Principe, EE Santana, AK Barros, "Mixed Generative and Supervised Learning Modes in Deep Predictive Coding Networks," Intl. Joint Conf. on Neural Networks, 2015.

Eder Santana, K Dockendorf, JC Principe, "Learning joint features for color and depth images with Convolutional Neural Networks for object classification," Intl. Conf. on Acoustics, Speech, and Signal Processing, 2015.

Eder Santana, Brockmeier AJ, Principe JC., "Joint optimization of algorithmic suites for EEG analysis.", IEEE EMBS Neural Engineering Conference, Aug. 2014.

A J. Brockmeier, **Eder Santana**, L G. Sanchez Giraldo, and JC. Principe, "Projentropy: Using entropy to optimize spatial projections", Intl. Conf. on Acoustics, Speech, and Signal Processing, pp. 4538-4542, May 2014

MV Lopes, E Aguiar, **Eder Santana**, and A. K. Barros. "ICA feature extraction for spike sorting of single-channel records." In Biosignals and Biorobotics Conference (BRC), 2013 ISSNIP, pp. 1-5. IEEE, 2013.

EE Santana, JC. Principe, **Eder Santana**, AK Barros and RCS Freire. "Biologically Inspired Algorithm Based On error Minimization." Brain Inspired Cognitive Systems, 2008, São Luís. Proc. of BICS'2008 (2008).

Workshops:

Eder Santana, EE Santana, R. C. S. Freire, and AK Barros. "Reproducing Kernel Hilbert Space Method for Blind Source Extraction." In Semetro 2009.

Eder Santana, EE Santana, RCS Freire, AK Barros, A New fixed-point algorithm for nonlinear Hebbian Learning. Comunidade Brasileira de Engenharia Biomedica, 2009.

TEACHING

EEL 5525 Fundamentals of Digital Signal Processing (TA)
University of Florida, Gainesville, FL — 2013

EEL 3135 Introduction to Signals and Systems (TA)
University of Florida, Gainesville, FL — 2014

Stochastic Processes (substitute professor)
Federal University of Maranhao, Sao Luis, Brazil — 2012

Digital Circuits (theory and lab, substitute professor)
Federal University of Maranhao, Sao Luis, Brazil — 2012

EXPERIENCE

Intern, Paracosm
Gainesville, FL — 2014

I Developed a convolutional deep neural network for object recognition using Primesense cameras. The model was contracted by Nielsen Corp. This work results in the paper "Learning joint features for color and depth images with Convolutional Neural Networks for object classification" accepted for oral presentation at ICASSP 2015.

Open source developer
Gainesville, FL

I contribute to Keras: A Thano based deep learning library (Python). I also maintain Seya a library with advanced architectures Keras such as the Deep Recurrent Attentive Writer (DRAW) and Neural Turing Machines. Recently I started a visualization library for deep learning models called Agnez.