Cognitive Architectures for Object Recognition in Video

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I-Requisites for a Cognitive Architecture (intermediate)

* Processing in space
* Processing in time with memory
* Top down and bottom processing
* Extraction of information from data with generative models
* Attention

II- Putting it all together (intermediate)

* Attention Based Object Recognition

III- Current work (advanced)

* Interpretability of DL with Information Theoretic Concepts
* Augmenting Deep Learning with memory

Biosketch

**Jose C. Principe** is a Distinguished Professor of Electrical and Computer Engineering at the University of Florida where he teaches advanced signal processing, machine learning and artificial neural networks (ANNs). He is Eckis Professor and the Founder and Director of the University of Florida Computational NeuroEngineering Laboratory (CNEL) [www.cnel.ufl.edu](http://www.cnel.ufl.edu). The CNEL Lab innovated signal and pattern recognition principles based on information theoretic criteria, as well as filtering in functional spaces. His secondary area of interest has focused in applications to computational neuroscience, Brain Machine Interfaces and brain dynamics. Dr. Principe is a Fellow of the IEEE, AIMBE, and IAMBE. Dr. Principe received the Gabor Award, from the INNS, the Career Achievement Award from the IEEE EMBS and the Neural Network Pioneer Award, of the IEEE CIS. He has more than 38 patents awarded over 800 publications in the areas of adaptive signal processing, control of nonlinear dynamical systems, machine learning and neural networks, information theoretic learning, with applications to neurotechnology and brain computer interfaces. He directed 97 Ph.D. dissertations and 65 Master theses. He wrote in 2000 an interactive electronic book entitled “Neural and Adaptive Systems” published by John Wiley and Sons and more recently co-authored several books on “Brain Machine Interface Engineering” Morgan and Claypool, “Information Theoretic Learning”, Springer, “Kernel Adaptive Filtering”, Wiley and “System Parameter Adaption: Information Theoretic Criteria and Algorithms”, Elsevier. He has received four Honorary Doctor Degrees, from Finland, Italy, Brazil and Colombia, and routinely serves in international scientific advisory boards of Universities and Companies. He has received extensive funding from NSF, NIH and DOD (ONR, DARPA, AFOSR).