

EEL 6814

NEURAL NETWORKS FOR SIGNAL PROCESSING (3)

Department of Electrical and Computer Engineering, University of Florida

- Graduate** Prereq: Knowledge of adaptive signal processing. Nonlinear signal processing and neural networks. Gradient descent learning in the additive neural model. Statistical Learning Concepts. Dynamic neural networks and the issues of function approximation and short term memory. Unsupervised learning networks. Information Theoretic Learning.
- Format** Course will be taught in the Interactive Teaching Laboratory and students will have access to computers in every lecture.
- Website** <http://www.cnel.ufl.edu>
- Text Book:** Neural Networks and Learning Machines, by Haykin, P. Hall, 2009. + notes of the instructor.
- References:** Neural and Adaptive Systems: Fundamentals Through Simulation, Principe, Euliano and Lefebvre, Wiley, 2000.
Information theoretic Learning, Principe, Springer, 2010.
The Nature of Statistical Learning Theory, Vapnik, Springer, 1995.
Neural Networks for Pattern Recognition, Bishop, Oxford, 1998.
- Professor:** J.C. Principe, Distinguished Professor of Electrical Engineering. Office EB 451, principe@cnel.ufl.edu, phone 392-2662.
- Goals:** Understand and utilize neural network concepts for signal processing and pattern recognition. Neural networks models will be explained from the point of view of nonlinear adaptive signal processing. Stress time varying models. Figures of merit for neural network design will also be covered.
- Projects:** Several homeworks, and class projects involving neural solutions to real world problems.
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| Homework | 30% |
| Project I | 20% |
| Project II | 20% |
| Exam | 30% |
- Computer:** Homework and projects will require access to a fast personal computer to MATLAB and the NeuroSolutions simulator.