

Spring 2001

EE 7745: Neural Networks, Iterative Maps and Chaos

Instructor: Subhash Kak, Room EE325

Course Description Motivation from neuroscience and AI. Various neural network models including Hopfield, Backpropagation, RBF, and the CC Family and their applications for pattern recognition and time-series prediction. Study of chaos and fractals. Quantum computers—their theory and implementation.

Textbook Lecture notes, Web based resources. You can access several of my own papers on the course topics at my homepage
www.ee.lsu.edu/kak/kak.html

Grading Assignments (20%), Term Papers With Class Presentations (20%), Midterm Exam (30%), Final Exam (30%).

Assignments Experiments on different neural network models. These will have to be done using Matlab.

List of Possible Term Papers

- Neural networks for control applications.
- Implementation of portfolio investment strategy using neural networks.
- Proposals for the implementation of quantum computers.
- Neural networks to study protein folding.
- A neural network model for the memory of the immune system.
- An interface and computing engine for a personal finance system.
- A recurrent neural network for generating English text.
- A neural network based speech synthesis system.

- Neural network approach to robotics.
- Neural networks applied to logic testing.
- The iterative system approach to data compression.
- A learning vector quantization system for EMG classification.
- Neural networks in multimedia data organization.
- Neural networks for noise equalization.
- Neural network applications to data security.
- Expert networks.
- Temporal difference approach to prediction.
- Time-series prediction.
- Design of an auction room.
- Neural networks for data compression.
- Neural networks in knowledge networks.
- New models of learning.
- Quantum computing algorithms.

Other Topics I am open to suggestions for additional topics and problems. Please see me with your ideas.

January 17, 2001