CN710, Fall 2007

Advanced Topics in Neural Modeling: Comparative Analysis of Learning Systems

Instructor: Prof. Gail A. Carpenter, Department of Cognitive and Neural Systems, Boston University, 677 Beacon Street, Room 303, Boston MA 02215
(617) 353-9483

Office hours: After class; or schedule an appointment in person; or send me an email listing a variety of possible times over several days.

Classes: Mondays, 9:30 AM - 12:30 PM, 677 Beacon Street, CNS Tech Lab conference room (3rd floor)
September 10 – December 17, 2007

Schedule notes: There will be no class on October 8 or November 12 (University holidays).
CN710 will meet on Tuesday, October 9 (BU Monday schedule).

Email ([at] cns.bu.edu, except where noted). For each email related to CN710 begin the Subject line as follows:
Subject: 710 [YOUR FIRST NAME] Rest of subject line

Cloud (Bo) Cao ffcloud
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CELEST
Max Versace

Course description: CN710 considers the systematic analysis of supervised learning systems from neural networks, statistics, and artificial intelligence. Supervised learning systems include multi-layer perceptrons (MLP), ARTMAP, support vector machines, and K-nearest neighbors (KNN). Working in collaboration, class members analyze many different algorithms and methods for pre- and post-processing data, with common benchmark problems and system evaluation criteria.

Book report: Select a book for your personal study throughout the semester, and to turn in a 4-page essay based on the book, due at the final meeting on Monday, December 17. Your definition of “book” could be a portion of a large text (such as Vapnik’s Statistical Learning Theory) or a collection of 1-3 trade publications (such as Linked or On Intelligence). Turn in a brief summary of your proposed reading project by Tuesday, October 9.

Course materials: Notes and articles distributed weekly in class.

Evaluations: Grades will be based on your participation in weekly classes, your group leadership of discussions, your contributions to simulation projects, and your book report.

Syllabus on the web: http://cns.bu.edu/~gail/CN710_Syllabus_Fall2007_.pdf

CN710 web site / wiki: http://cns.bu.edu/cn710/Fall2007/
All students should contribute to the CN710 wiki. Karthik and Neel are working with Max to set up the wiki.
You will also be using and contributing to the Tech Lab website: http://cns.bu.edu/techlab/

CN710 discussions
You are in four groups of class discussion leaders. See the schedule on p. 2.
You are in a group with each other student in the class exactly once.
Each group should plan a class discussion of approximately 60 – 90 minutes.
To the class meeting BEFORE your scheduled week, your group should bring a short written description of your planned discussion topic, and paper copies of about 2-3 readings; and post the articles and summary on the CN710 wiki.
Take time and care to select quality topics and readings. At the top of each paper, list the names of students who have read all or most of the selection and who recommend that the paper is worth reading by the entire class.
Each class member should read all articles carefully, and prepare to participate in all discussions.
The leaders should also prepare a handout (approx. 1-3 pages) to support the discussion, and bring paper copies of these talking points to class on your scheduled day. After the discussion, post a final document on the CN710 wiki.
No PowerPoint.

Shared food & coffee: Bring food and coffee for all to share – and receipts for reimbursement – according to the schedule on p. 2.
CN 710  Fall 2007  
9:30AM, on Mondays (except where noted)  
Discussion leaders  
Food & coffee  

September 10

1  September 17  
Jesse  
Karthik  
Neel  
TOPIC:  Classification in finance  

2  September 24  
Karthik  
Hee Kyoung  
Jesse  
TOPIC:  Linked  

3  October 3  
Cloud  
Neel  
Hee Kyoung  
TOPIC:  Supervised learning  

4  October 9 (Tuesday)  
Book reading proposals are due.  
Cloud  
TOPIC:  Default ARTMAP  

October 12 (Friday), 2pm:  Science of Learning Seminar – Albert-László Barabási

5  October 15  
TOPIC:  Information fusion  
Jesse  

6  October 22  
Karthik  
TOPIC:  Finance  

7  October 29  
Karthik  
Hee Kyoung  
TOPIC:  Pattern theory  
http://cns.bu.edu/cn710/Fall2007/index.php?n=Main.ClassSeven

November 5  
Discuss benchmark problems and  
preliminary simulation reports.  
Cloud

8  November 19  
Hee Kyoung  
Jesse  
Jesse  
TOPIC:  Population/distributed coding  

9  November 26  
TOPIC:  Independent component analysis  
Karthik  

10  December 3  
TOPIC:  Remote sensing  
Hee Kyoung  

December 10  
Discuss final simulation results,  
posted by today on the CN710 wiki.  
Neel

December 17  
Final presentations:  Projects and book reports  
Cloud  