Machine Learning Methods for Bioinformatics

Instructor: Prof. Jianlin Cheng

Department: Computer Science, University of Missouri, Columbia

Location: EBW 240; **Time**: WeFr 11:00 am - 12:15 pm; **Office Hours**: WeFr 2:00 - 3:00;

Semester: Fall 2012

Prerequisite: some background in bioinformatics, machine learning or data mining background

Course web site: http://www.cs.missouri.edu/~chengji/mlbioinfo/mlbioinfo.htm

Objectives:

This course teaches statistical machine learning methods and their applications in Bioinformatics. The course intends to achieve two major goals. The first goal is to help students understand the theories of advanced machine learning methods. The second goal is to teach students how to develop Bioinformatics tools using the methods.

Topics:

1. Hidden Markov models and their applications in bioinformatics

2. Neural networks and their applications in bioinformatics

3. Support vector machines and their applications in bioinformatics

4. Bayesian networks and their applications in bioinformatics

Homework:

Reading of classic papers
A comprehensive project of applying machine learning methods to a bioinformatics problem

Grading:

Project presentation (50%) and report (50%)

References:

1. Baldi and Brunak. Bioinformatics: the Machine Learning Approach (Second edition). MIT press, 2001.
2. Durbin, Eddy, and Krogh. Biological Sequence Analysis: Probabilistic Models of Proteins and Nucleic Acids. Cambridge University Press, 1999.

Disability Accommodations:

If you need accommodations because of a disability, if you have emergency medical information to share with me, or if you need special arrangements in case the building must be evacuated, please inform me immediately. Please see me privately after class, or at my office. Office location:_____ Office hours : _____ To request academic accommodations (for example, a note taker or extended time on exams), students must also register with the Office of Disability Services (http://disabilityservices.missouri.edu), S5 Memorial Union, 882-4696. It is the campus office responsible for reviewing documentation provided by students requesting academic accommodations, and for accommodations planning in cooperation with students and instructors, as needed and consistent with course requirements. For other MU resources for students with disabilities, click on "Disability Resources" on the MU homepage.

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