CSCI 732 Research Practicum in Bioinformatics

Department of Computer Science, Queens College

Fall 2003 (last updated: September 6, 2003)

Course Information

- Meet in room T114, T 6:30 - 9:05 pm
- Instructor: Dr. Mingzhou Song, msong@cs.qc.edu, 718-997-3584
- Office: NSB A326, Office hours: one hour before class.
- Text:
  - Current journal articles and conference papers.
- Prerequisites: graduate standing in biological, computer, mathematical or statistical science, or permission of instructor.
Grading Policies

- About 5 sets of homework (50%).
- One team project (50%).
- Grading policies:
  - Homework is due two weeks after posted. Late homework will not be accepted.
  - No incomplete grades.

Topics

Lecture 1. (9/2/03) Course overview and introduction.
Lecture 2. (9/4/03) Basics of molecular biology
Lecture 3. (9/9/03) Human genome composition
Lecture 4. (9/11/03) Biotechnology tools
Lecture 5. (9/16/03) Sequence alignment – dynamic programming
Lecture 6. (9/18/03) Sequence alignment – BLAST
Lecture 7. (9/23/03) Multiple sequence alignment – 1
Lecture 8. (9/25/03) Multiple sequence alignment – 2
Lecture 9. (9/30/03) Expectation maximization (EM) algorithm – 1
Lecture 10. (10/2/03) EM algorithm – 2
Lecture 11. (10/7/03) No class
Lecture 12. (10/9/03) Transcription regulation with motif discovery – 1
Lecture 13. (10/14/03) Transcription regulation with motif discovery – 2
Lecture 14. (10/16/03) Bayesian network – 1
Lecture 15. (10/21/03) Bayesian network – 2
Lecture 16. (10/23/03) Hidden Markov model (HMM)
Lecture 17. (10/28/03) Gene finding by HMM
Lecture 18. (10/30/03) Gene finding by comparative genomics – 1
Lecture 20. (11/6/03) Clustering techniques – 1
Lecture 21. (11/11/03) Clustering techniques – 2
Lecture 22. (11/13/03) Classification techniques
Lecture 23. (11/18/03) Support vector machines
Lecture 24. (11/20/03) Gene expression analysis – 1
Lecture 25. (11/25/03) Gene expression analysis – 2
Lecture 26. (11/27/03) No class
Lecture 27. (12/2/03) RNA secondary structure prediction – 1
Lecture 28. (12/4/03) RNA secondary structure prediction – 2
Lecture 29. (12/9/03) Mass spectrometry
Lecture 30. (12/11/03) Protein structure prediction
Final week: project presentation.