Chapter 1.0: Introduction

1.0 Course Plan; references

Prof. Yechiam Yemini (YY)
Computer Science Department
Columbia University

Course Goals

- Comprehensive introduction to bioinformatics
  - Goal 1: State of the art intro
  - Goal 2: From basics to research

- Focus on
  - Sequence analysis techniques
  - Micro-array analysis
  - Biological networks (systems biology)

- Caveats... read the small letters
  - Rapidly evolving interdisciplinary field
  - "THE Textbook" does not yet exist
Approximate Schedule

<table>
<thead>
<tr>
<th>Dates</th>
<th>Chapters</th>
</tr>
</thead>
<tbody>
<tr>
<td>9/4-9/6</td>
<td>Chapter 1: Biology Primer</td>
</tr>
<tr>
<td>9/11-9/25</td>
<td>Chapter 2: Sequence alignment (similarity)</td>
</tr>
<tr>
<td>9/27-10/2</td>
<td>Chapter 3: Phylogenetics</td>
</tr>
<tr>
<td>10/4-10/11</td>
<td>Chapter 4: Hidden Markov Modeling</td>
</tr>
<tr>
<td>10/16-10/23</td>
<td>Chapter 5: Micro-array analysis</td>
</tr>
<tr>
<td>10/25-10/30</td>
<td>Chapter 6: Bayesian networks techniques</td>
</tr>
<tr>
<td>11/1-11/15</td>
<td>Chapter 7: Regulatory networks</td>
</tr>
<tr>
<td>11/20-11/27</td>
<td>Chapter 8: Network topology</td>
</tr>
<tr>
<td>11/29-12/4</td>
<td>Chapter 9: Metabolic networks</td>
</tr>
<tr>
<td>12/6</td>
<td>Chapter 10: Signaling networks</td>
</tr>
</tbody>
</table>

Course Assignments & Grading

- Course projects; 3 deliverables
  - Plan
  - Presentation
  - Report
- Assignments (TBD)
- Grading: project deliverables + assignments
Course Administration

Help:
- Instructor: Prof. Y. Yemini (YY)
  - Office hrs: Tu 6-7PM or by appointment
- TA: TBD

CS academic honesty policy is strictly observed
- http://www.cs.columbia.edu/education/honesty

Books and references
- Web site: https://courseworks.columbia.edu
- Older web site: www.cs.columbia/4761
- Per class

Course References: Bioinformatics

  - Algorithmic intro; strong on algorithms
  - Comprehensive reference book
  - Comprehensive, concise reference book
  - Strong on probabilistic sequence analysis
  - A gem; lots of application examples & hands-on discovery
**References: Biology Background**