Elements of BioInformatics

Syllabus

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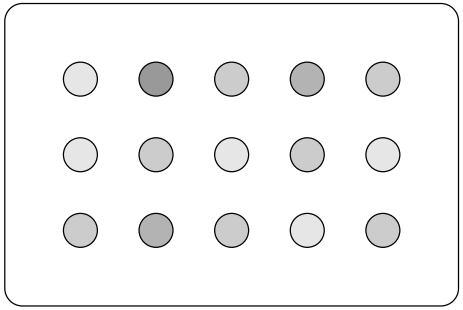

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What is bioinformatics about?

* Dealing with huge amounts of data in biology	databases, statistics
* Revealing information from biological data	pattern search, data mining

What does bioinformatics border with?

* Experiment and laboratory management	image processing
* Molecular, cellular, and population modeling	dynamics equations
* Medical informatics, business intelligence	expert systems

Interdisciplinary position

field view:

Biology, Physics - data production, analyse practice

Information technology - computational & database systems

Computer science - algorithm development & implementation

Mathematics - model development, correctness proofs

Interdisciplinary position

task view:

Model development
(Bionformatics)

Algorithm implementation
(Bionformatics)

Data acquisition
(Genetic engineering)

Data analyzing
(Computational biology)

Lectures

01 & 02: Introduction into biology and physics, into mathematics and informatics

03 & 04: Gene sequencing, gene assembly, string processing, pattern search

05 & 06: Microarrays, data normalization, statistics, linear methods, clustering

07: Data mining, information harvesting, applied mathematical logic

08 & 09: 3D structures, prediction, protein, NA databases, online resources

10 & 11: Descriptions, ontology, example utilize, software tools, software usage

12: Appendix, computations in biology, biology in computations