Why Bioinformatics

Bioinformatics Seminar (MTAT.03.242)

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Bioinformatics

Biology

Computer science
Biology milestones

- 1950: DNA structure reported by Watson and Crick (1953)
- 1970: First recombinant DNA molecules were created (P. Berg 1972)
- Di-deoxy sequencing reported by F. Sanger (1977)
- 1980: Polymerase chain reaction reported (Mullis 1983)
- 1990: Human genome project initiated in public section (1990)
- 1995: First completed genome sequence in public sector for *M. genitalium* (Fraser et al. 1995)
- 1998: Human genome project initiated in private sector (Venter 1998)
- 2000: Initial drafts of human genome reported simultaneously in private and public sectors (2001)
- 2004: Rough draft (5x coverage) chimpanzee reported (2005)
- 2007: Massively parallel sequencing technologies now being widely utilized about 2007 (technology made publicly available in 2004)

http://imihumangenomproject.blogspot.com.ee/2012/12/genome-sequencing.html
Sequencing of Human genome

http://imihumangеномproject.blogspot.com.ee/2012/12/genome-sequencing.html
Genomic data

http://www.futuretimeline.net/blog/2014/01/16.htm#.VfsvUZ2qpbC
Genomic data

Growth of GenBank and WGS

Analysis of sequences

- Sequence alignment
- Gene prediction
- Genome assembly
- Protein structure / domains
Analysis of genomic data

- Gene expression
- Protein-protein interactions
- Drug design / discovery
- GWAS
- Model evolution
Personalised medicine

http://www.pfizer.ie/personalized_med.cfm
How to analyse data

• Specific algorithmic solutions
• Methodology and pipelines
• User friendly software
DO the analysis!

DATA: BY THE NUMBERS

NUMBER OF YEARS TO GET DATA: 3
YES! FINALLY!

NUMBER OF YEARS TO INTERPRET DATA: 2
what does it all mean??

NUMBER OF YEARS TO WRITE ABOUT DATA: 1.5
blah blah blah blah...

NUMBER OF SLIDES TO PRESENT DATA: 1
RESULTS

that's it?

www.phdcomics.com
Databases
Databases
Tools and Services

http://biit.cs.ut.ee/software :)
