

Bioinformatics

Algorithms and Software for Genomics and Proteomics



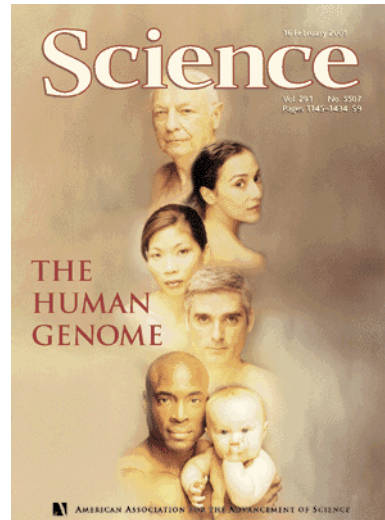
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Professor

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Genomics

**Human genome
sequence**

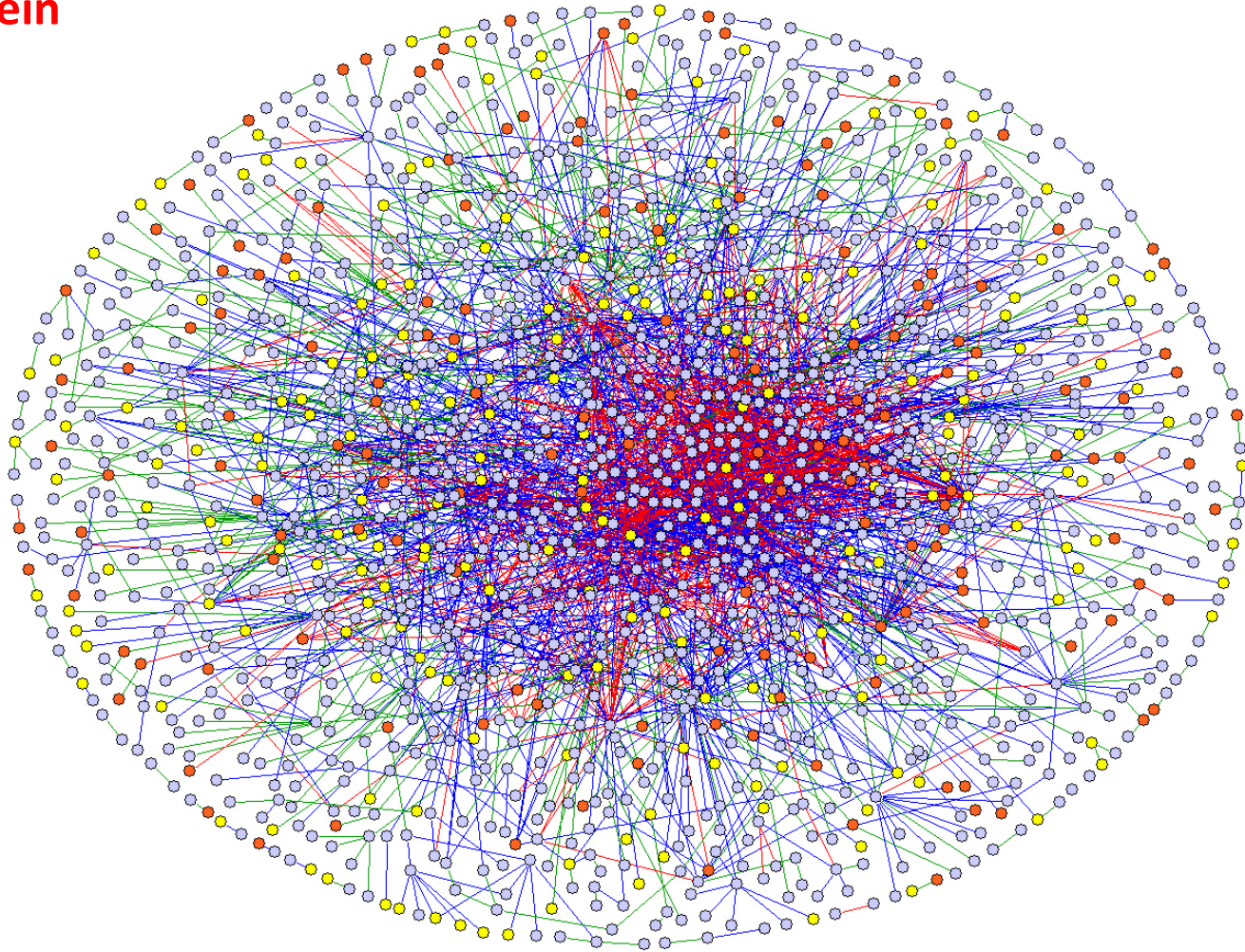


**High-throughput
DNA sequencing**



Proteomics

Human protein
interactions



Algorithms and Software

- DNA sequencing error correction
 - **HiTEC** – Bioinformatics 2010
 - **RACER** – Bioinformatics 2013
- Genome assembly
 - **SAGE** – BMC Bioinformatics 2014
 - **SAGE2** – Bioinformatics 2017
- Genome assembly evaluation
 - **LASER** – BMC Research Notes 2015
- Sequence similarity search
 - **SpEED** – Bioinformatics 2007, Bioinformatics 2009, Bioinformatics 2011
 - **E-MEM** – Bioinformatics 2014
- Read mapping
 - **SHRiMP2** – Bioinformatics 2011
- DNA probe design
 - **BOND** – BMC Genomics 2011, BMC Bioinformatics 2013
- PacBio read alignment
 - **HISEA** – BMC Bioinformatics 2017
- Protein-protein interaction prediction
 - **SPRINT** – BMC Bioinformatics 2017

Applications

- Cancer research
- Cancer mutation discovery
- Genetic disorders
- Metagenomics
- DNA-protein interaction discovery
- Personalized medicine

Lab

Current students:

- Yiwei Li
- Qin Dong
- Sabyasachi Patajoshi
- Valeria Cesar
- Debanjan Guha Roy
- Caocao Liu
- Arnab Mallik
- Nicholas DelBen
- Zaid Albirawi
- Sourajit Basak
- Dipanjan Chatterjee

Computer clusters:

- 1TB RAM, 32 cores
- 4x 256GB RAM, 12 cores



Teaching

- **CS9877: Research Topics in Genomics and Proteomics**
 - Introduction to Bioinformatics
 - Hot research topics
 - No prerequisites
 - No assignments or exams