

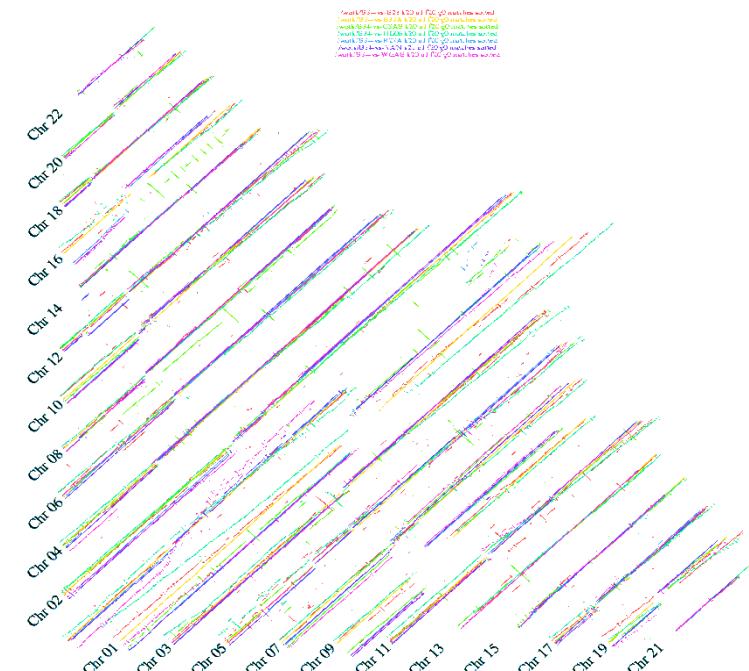
CSCI1820 Algorithmic Foundations of Computational Biology

<http://www.cs.brown.edu/courses/csci1820/>

Prof. Sorin Istrail



"The Sequence of the Human Genome" Science, 2001



"Whole-genome shotgun assembly and comparison of human genome assemblies" Proc. Nat. Acad. Sci. USA, 2004

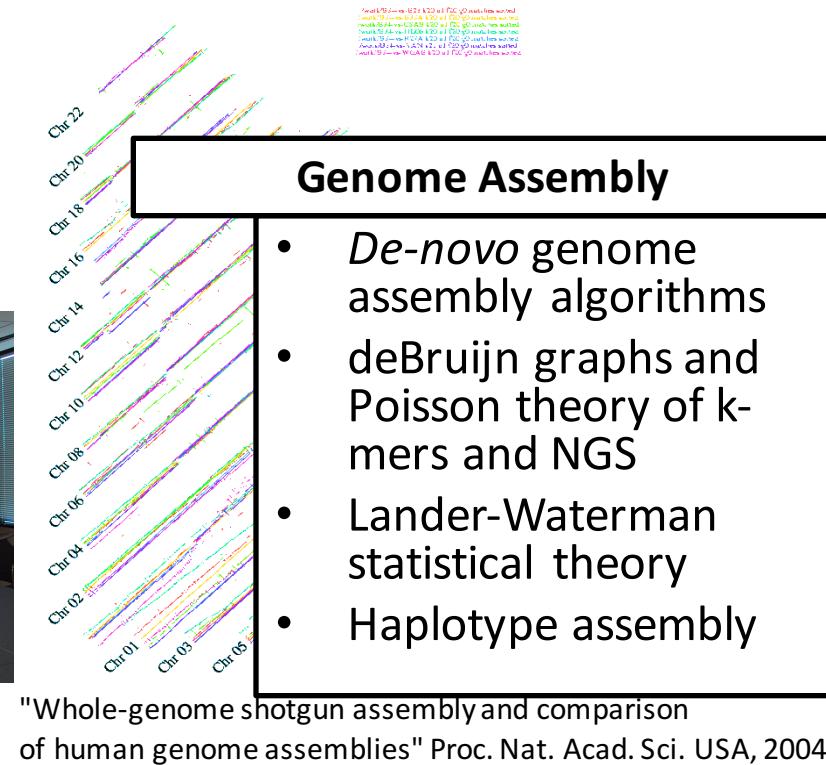
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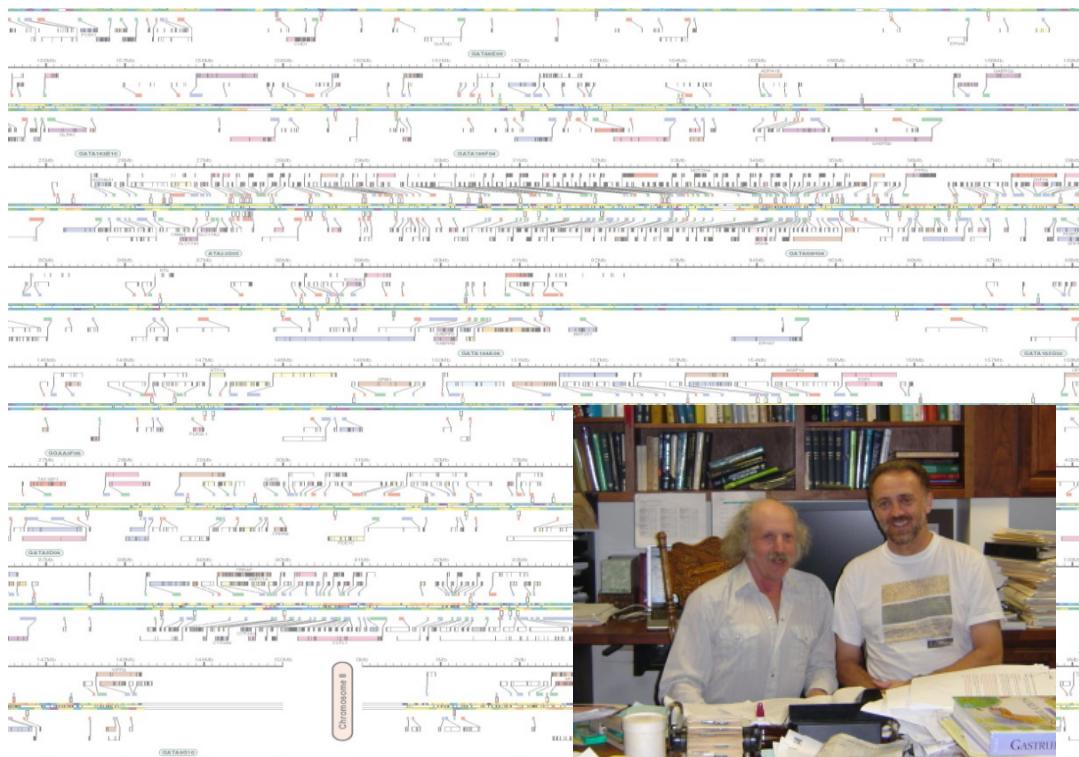
"The Sequence of the Human Genome" Science, 2001



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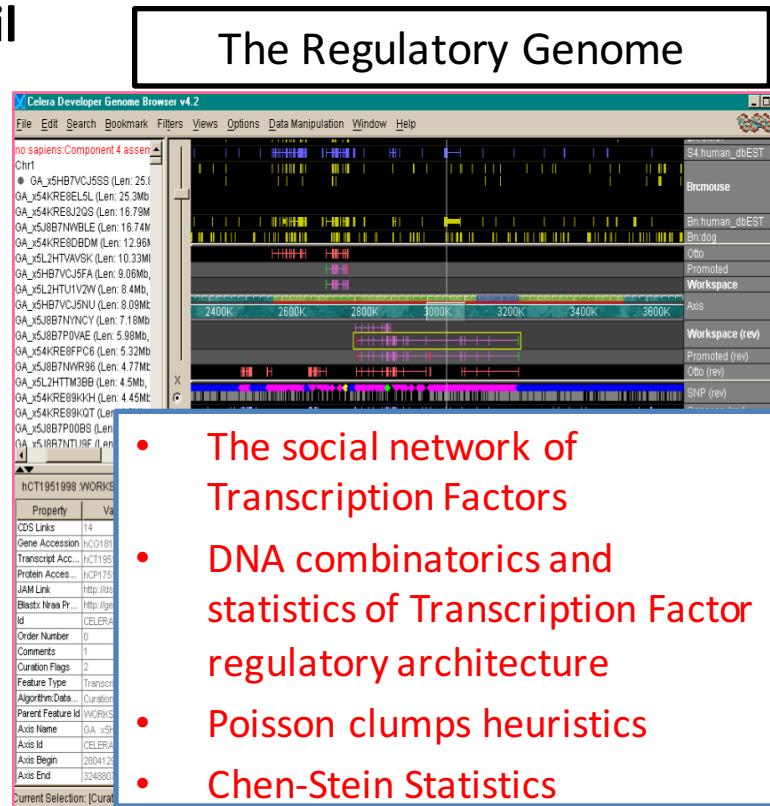
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Eric Davidson and Sorin working on "Logic functions of the genetic cis-regulatory code"

The Regulatory Genome



- The social network of Transcription Factors
- DNA combinatorics and statistics of Transcription Factor regulatory architecture
- Poisson clumps heuristics
- Chen-Stein Statistics

The cis-Regulatory CYRENE Genome Browser

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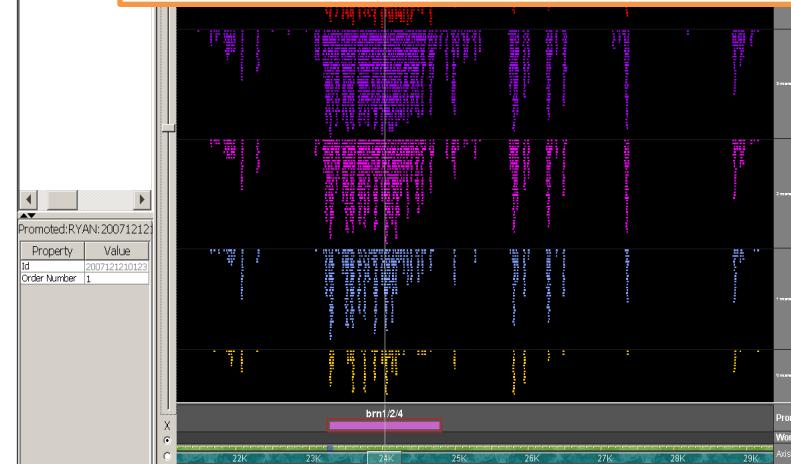
"The Sequence of the Human Genome" Science, 2001

- Suffix trees in linear time
- Burrows-Wheeler transform
- Karlin-Altshuler Statistics
- BLAST algorithm: Random walks, Information theory and P-values

CYRENE C
File Edit Search
longirostris part
Unknown Chromosome
• Genomic Axis (Left)

Promoted:RYAN:20071212

Property	Value
Id	2007121210123
Order Number	1



The science and art of mapping DNA fragments, genes, and genomes to genomes

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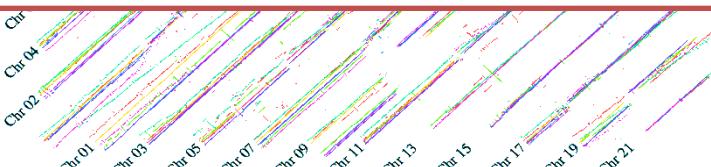
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Topics include

- Genome sequencing and assembly: algorithms and statistical theory
 - BLAST algorithms and statistical theory of alignment and searching
 - Mapping reads and genomes to genomes
 - DNA combinatorics and statistical theory of regulatory regions of genes
 - Hidden Markov model algorithms and gene prediction



"Whole-genome shotgun assembly and comparison
of human genome assemblies" Proc. Nat. Acad. Sci. USA, 2004