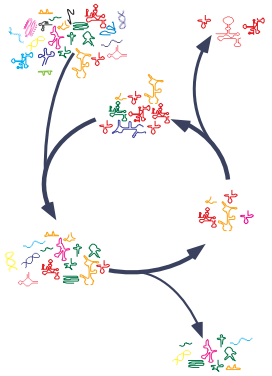

"Evolution as Computation"

A DIMACS Workshop

Princeton University

January 11-12, 1999

Organizing Committee:

Laura Landweber, Princeton (Co-Chair) lfl@princeton.edu
Erik Winfree, Cal. Tech. (Co-Chair) winfree@hope.caltech.edu
Richard Lipton, Princeton University
Stephen Freeland, Cambridge University

The study of the genetic basis for evolution has flourished in this century, as well as our understanding of the evolvability and programmability of biological systems. Genetic algorithms meanwhile grew out of the realization that a computer program could use the biologically-inspired processes of mutation, recombination, and selection to solve hard optimization problems. Genetic and evolutionary programming provide further approaches to a wide variety of computational problems. Drawing together computer scientists and molecular evolutionary biologists, this workshop asks, does a synthesis of these experiences reveal fundamental insights into both the computational nature of biological evolution as well as processes of importance to computer science? Solicited topics include biological models of nucleic acid information processing and genome evolution; molecules, cells, and metabolic circuits that register logical relationships among proteins; the genetic code; genetic algorithms, genetic and evolutionary programming, machine learning, and complexity. The goal is to combine theory and experiments to construct a quantitative view of the computations that take place in cells and the combinatorial processes that drive evolution at the molecular level.

Invited Speakers:

• John Koza • Pim Stemmer • Jim Shapiro • Roger Brent • Mark Ptashne • David Prescott • Lila Kari • Jim Crutchfield • Grzegorz Rozenberg

Paper/Poster Deadline:* *Dec. 12, 1998* *to evocomp@bramble.princeton.edu

Instructions, Information & Registration at:

http://www.dimacs.rutgers.edu/Workshops/Evolution/

Part of the DIMACS Special Focus on DNA Computing