Call for Participation

The Fourth DIMACS International Algorithm Implementation Challenge:

Two Problems in Computational Biology: Fragment Assembly and Genome Rearrangements

In conjunction with its Special Year on Mathematical Support for Molecular Biology, the Center for Discrete Mathematics and Theoretical Computer Science (DIMACS) invites participation in an international Implementation Challenge focussed on two problems from Computational Molecular Biology: Fragment Assembly and Genome Rearrangments. The Implementation Challenge will take place between September 1994 and August 1995. Participants are invited to carry out research projects related to these problem areas and to present research papers at a DIMACS workshop to be held in September 1995. A refereed workshop proceedings will be published.

Research Projects. There still is a large gap in Computational Molecular Biology between biological application and algorithmic work aimed at answering biological questions. It is the goal of this implementation challenge to help bridge this gap. **Fragment Assembly** is the problem of reconstructing a DNA sequence knowing only the sequences of many overlapping fragments of it. **Genome Rearrangments** is the problem of comparing two orders of genes under the assumption that one order is transformed into another by a series of rearrangments. For both problems there exist algorithms and software that in the case of fragment assembly is widely used. Many forms of contributions are conceivable. Participants may wish to implement algorithms or use existing implementations for evaluation; participants may develop new algorithms, implement them and compare to existing ones; participants may formalize the underlying biological problem in a new manner and subsequently show the merits of the resulting algorithms and implementation over existing ones. Work on other problems from computational molecular biology than the suggested ones (for instance the problem of constructing phylogenies) may be acceptable as well. The advisory committee is not presently in a position to provide test instances for such problems, but can arrange for DIMACS to serve as a clearing house if participants wish to provide their own.

DIMACS Support. The advisory committee will provide benchmark instances and evaluation criteria for the problems. The committee offers the participants advice and support in their projects throughout the duration of the implementation challenge. DIMACS facilities will provide a clearing-house for exchange of programs and data and for communication among researchers. DIMACS can provide neither financial support for research projects nor machine cycles for the experiments.

How to Participate. Challenge materials will be available via anonymous ftp from dimacs.rutgers.edu. A document giving general information on the challenge and the topics will be available September 30, 1994. We expect most communication with respect to the Challenge to take place over the Internet. Participants should submit an abstract of their project.

Advisory Committee. Ellson Chen, Applied Biosystems, Sorin Istrail, Sandia National Laboratory, David Johnson, AT&T Bell Laboratories, John Kececioglu, UC Davis, Joachim Messing, Rutgers University, Joseph Nadeau, Jackson Laboratory, Pavel Pevzner, Pennsylvania State University, Peter Rice, Sanger Center, Martin Vingron, German National Research Center for Computer Science (Coordinator), Michael Waterman, University of Southern California.