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Editor's Introduction

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Editor's Introduction

Welcome to the inaugural issue of the *ORSA Journal on Computing*, dedicated to the memory of one of its founders, Robert G. Jeroslow. I wish first to thank the members of the committee established by the ORSA Computer Science Technical Section who prepared the proposal for this journal: **Karla Hoffman**, **Robert G. Jeroslow**, **Donald H. Kraft**, and **William P. Pierskalla**. Their efforts for nearly 2 years was supplemented by additional help from **Thomas Magnanti**. I am most grateful to them and to ORSA Council for approving this long-needed journal.

Getting started is never easy, but I was fortunate to have chosen an outstanding editorial board (see inside front and back covers). Everyone helped to shape *JoC*'s policies and obtain excellent papers to establish our scope and quality. In this issue we have four outstanding papers, each of a different kind.

The first paper, *Dynamic Programming, Integral Polyhedra, and Horn Clause Knowledge Bases*, by Robert G. Jeroslow and Jinchang Wang, was also the first paper submitted to *JoC*. It deepens the ties between integer programming and computational logic. In effect, this paper shows how an OR approach (namely, dynamic programming on what is shown to be a special integer polyhedron) solves an important inference problem for Horn clause resolution. Although Horn clause form is special (only one consequent), it is prevalent in expert systems, especially under PROLOG. This contribution uses duality effectively to construct a proof, giving a complete causal trace from the inference engine.

The second paper, *Parallel Numerical Optimization: Current Status and an Annotated Bibliography*, by Stavros A. Zenios, gives insight as it provides a central source for parallel computation. The tutorial begins with models of computation, giving the paradigms for algorithm design and analysis. A brief introduction to neural computing is included, which is currently a subject of intense research activity. The annotated bibliography is divided by conventional taxonomies: *linear* vs. *nonlinear* and *stochastic* vs. *deterministic*. Again, special attention is given to neural computation.

The third paper, *Fixed Order Branch-and-Bound Methods for Mixed-Integer Programming: The ZOOM System*, by Jaya A. Singhal, Roy E. Marsten and Thomas L. Morin, describes the essence of a software system called ZOOM (Zero-One Optimization Methods). Tactical variations reported reflect its extensive applications since its incorporation into XMP in 1982. The computational experiences reported give some of the effects of parameter settings.

The fourth paper, *Numerical Solution of Linear Equations Arising in Markov Chain Models*, by Daniel P. Heyman and Alyson Reeves, examines Gaussian elimination, state-reduction, closed-form solutions, and several hybrid methods. Their relative merits are based on accuracy and speed of computation of first passage or absorption times. Theoretical analysis is well complemented by a careful empirical study.

Collectively, these papers illustrate some of the breadth of the interfaces between computer science and operations research. All researchers are invited to submit contributions, following the *Instructions to Contributors*, which appears following the articles. (See also the inside front cover.)

HARVEY J. GREENBERG
Editor