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Interfaces in Computer Science and Operations Research

Advances in Metaheuristics, Optimization, and Stochastic Modeling Technologies



The disciplines of computer science and operations research (OR) have been linked since their origins, each contributing to the dramatic advances of the other. This work explores the connections between these key technologies: how high-performance computing methods have led to advances in OR de ployment, and how OR has contributed to the design and development of ad vanced systems. The collected writings-from researchers and practitioners in Computer Science, Operations Research, Management Science, and Artificial Intelligence-were among those delivered at the Fifth INFORMS Computer Science Technical Section Conference in Dallas, Texas, January 8-10, 1996. The articles advance both theory and practice. Presented are new approaches to complex problems based on: metaheuristics (neural networks, genetic al gorithms, and Tabu Search), optimization and mathematical programming, stochastic methods, constraint programming, and logical analysis. These ad vanced methodologies are applied to new applications in such areas as: telecom munications network design, financial engineering, manufacturing, project man agement, and forecasting, airline and machine scheduling, vehicle routing, mod eling and decision support systems. Featured is a remarkable paper by keynote speaker Fred Glover, creator of the Tabu Search family of metaheuristics. In it he develops the principles of memory-based heuristic methods, contrasts them with the popular genetic algorithms and simulated annealing, provides a sweeping survey of application vignettes, and points to promising avenues for future research.

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