数学与系统科学研究院学术报告

报告题目： Ordinal Optimization:Soft Optimization for Hard Problems

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摘要:

Ordinal optimization (OO) is an important tool to deal with simulation-based optimization problems, in which the performance of each design can only be evaluated through time-consuming simulation. Since first developed in 1992, ordinal optimization has become a research area with more than two hundreds published papers and many successful applications. This talk reviews the basic ideas of ordinal optimization and some recent major extensions, including: 1)By comparing different selection rules and using a good one for the given problem, we are able to improve the efficiency of OO and further save the computing budget. 2) By introducing the concept of layers in a multi-dimensional design space, vector ordinal optimization was developed to deal with multiple objective functions. 3) By using a feasibility model, constrained ordinal optimization was developed to deal with constrained optimization. As an example, we show the application of ordinal optimization in a remanufacturing system, in which OO saves the computing budget by at least one order of magnitude.

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Qing-Shan Jia received the B.S. degree in automation and the Ph.D. degree in control science and engineering from Tsinghua University, Beijing, China, in 2002 and 2006 respectively. He visited the Division of Engineering and Applied Sciences, Harvard University, from Aug. 2006 to Feb. 2007. He is with Center for Intelligent and Networked Systems (CFINS), Department of Automation, Tsinghua University. His current research interests are simulation-based optimization and agent-based decentralized optimization of complex systems, with a specific focus on ordinal optimization.

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