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EDITORIAL

International conference EngOpt 2008

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This special issue of "Structural and Multidisciplinary Optimization" contains selected papers in the field of this journal that were presented at the International Conference on Engineering Optimization, "EngOpt 2008", held at Rio de Janeiro in June 2008.

The main aim of EngOpt conferences is to bring together at regular intervals engineers, applied mathematicians and computer scientists working on research, development and practical applications of optimization methods applied to all engineering disciplines. Some of the key topics at these conferences are as follows.

Engineering Design Optimization uses the latest design techniques to find the best design that can perform the desired tasks. Engineering optimization deals with the optimal design of elements and systems in all engineering fields. Design optimization techniques are largely employed in most of engineering disciplines, like automotive, aeronautical, mechanical, civil, nuclear, naval, mechanical, electrical, energy and off-shore engineering. This is due to the increase of technological competition and the development of powerful and efficient techniques for practical applications.

MDO—Multidisciplinary design optimization engineering is getting increasingly important, because systems are becoming increasingly complex and represented by large and sophisticated numerical models. They involve several interacting disciplines or are made up of distinct interacting subsystems that must be considered simultaneously to obtain efficient designs. Multidisciplinary design optimization is devoted to the design of complex systems involving interacting subsystems or disciplines. The main scientific challenges of MDO are concerned with the development of efficient numerical techniques and with the computational organization required for the necessary coupling of codes employed in interacting disciplines.

Inverse problems—Numerical methods for inverse problems in most of cases are based on optimization techniques similar to those employed in optimal design. This field, applied in all engineering disciplines, is of utmost importance for Engopt conferences.

Engineering simulation involving optimization techniques: Several physical phenomena are naturally represented by an optimization problem. This is the case when the "equilibrium" is attained at the minimum of an energy function. In several applications, constraints must be satisfied. This is the case of contact problems is solids mechanics.

About interdisciplinarity in engineering optimization. Modern engineering optimization is strongly interdisciplinary in two axes. The need of integration of basic and applied techniques and to solve real engineering problems, requires the cooperation of engineers, mathematicians and computer scientists, working on research and practical applications. A fundamental need for MDO is also the establishment of a strong communication of scientists and practitioners acting in different engineering disciplines. EngOpt is intended to be a forum to expose and share current and future research and innovation in all techniques involved in engineering optimization as well as in the relationships among them.

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