

Multidisciplinary Design Optimization

supported by Knowledge Based Engineering

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Multidisciplinary Design Optimization Supported By Knowledge Based Engineering

Ching Kuo Wang, Jing Guo



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Sobieszczanski-Sobieski, Alan Morris, Michel van Tooren, 2015-09-28 Multidisciplinary Design Optimization supported by Knowledge Based Engineering supports engineers confronting this daunting and new design paradigm. It describes methodology for conducting a system design in a systematic and rigorous manner that supports human creativity to optimize the design objectives subject to constraints and uncertainties. The material presented builds on decades of experience in Multidisciplinary Design Optimization (MDO) methods, progress in concurrent computing, and Knowledge Based Engineering (KBE) tools. Key features: Comprehensively covers MDO and is the only book to directly link this with KBE methods. Provides a pathway through basic optimization methods to MDO methods. Directly links design optimization methods to the massively concurrent computing technology. Emphasizes real world engineering design practice in the application of optimization methods. Multidisciplinary Design Optimization supported by Knowledge Based Engineering is a one stop shop guide to the state of the art tools in the MDO and KBE disciplines for systems design engineers and managers. Graduate or post graduate students can use it to support their design courses and researchers or developers of computer aided design methods will find it useful as a wide ranging reference.

Multidisciplinary Design Optimization Supported by Knowledge Based Engineering Jaroslaw Sobieszczanski-Sobieski, Alan Morris, Michel van Tooren, 2017-05-08 Multidisciplinary Design Optimization supported by Knowledge Based Engineering supports engineers confronting this daunting and new design paradigm. It describes methodology for conducting a system design in a systematic and rigorous manner that supports human creativity to optimize the design objectives subject to constraints and uncertainties. The material presented builds on decades of experience in Multidisciplinary Design Optimization (MDO) methods, progress in concurrent computing, and Knowledge Based Engineering (KBE) tools. Key features: Comprehensively covers MDO and is the only book to directly link this with KBE methods. Provides a pathway through basic optimization methods to MDO methods. Directly links design optimization methods to the massively concurrent computing technology. Emphasizes real world engineering design practice in the application of optimization methods. Multidisciplinary Design Optimization supported by Knowledge Based Engineering is a one stop shop guide to the state of the art tools in the MDO and KBE disciplines for systems design engineers and managers. Graduate or post graduate students can use it to support their design courses and researchers or developers of computer aided design methods will find it useful as a wide ranging reference.

Mechatronics and Applied Mechanics II Ching Kuo Wang, Jing Guo, 2013-02-13 Selected peer reviewed papers from the 2nd International Conference on Mechatronics and Applied Mechanics ICMAM 2012 December 6-7 2012 Hong Kong December 8-9 2012 Taipei

Multidisciplinary Design Optimization: An Emerging New Engineering Discipline, 1993 **Collaborative**

Multidisciplinary Design Optimization for Conceptual Design of Complex Products Edris Safavi, 2016-10-06

MULTIDISCIPLINARY design optimization MDO has developed in theory and practice during the last three decades with the aim of optimizing complex products as well as cutting costs and product development time. Despite this development, the implementation of such a method in industry is still a challenge and many complex products suffer time and cost overruns. Employing higher fidelity models HFMs in conceptual design, one of the early and most important phases in the design process, can play an important role in increasing the knowledge base regarding the concept under evaluation. However, design space in the presence of HFMs could significantly be expanded. MDO has proven to be an important tool for searching the design space and finding optimal solutions. This leads to a reduction in the number of design iterations later in the design process with wiser and more robust decisions made early in the design process to rely on. In complex products, different systems from a multitude of engineering disciplines have to work tightly together. This stresses the importance of evolving various domain experts in the design process to improve the design from diverse engineering perspectives. Involving more engineers in the design process early on raises the challenges of collaboration, known to be an important barrier to MDO implementation in industry. Another barrier is the unavailability and lack of MDO experts in industry; those who understand the MDO process and know the implementation tasks involved. In an endeavor to address the mentioned implementation challenges, a novel collaborative multidisciplinary design optimization CMDO framework is defined in order to be applied in the conceptual design phase. CMDO provides a platform where many engineers team up to increase the likelihood of more accurate decisions being taken early on. The structured way to define the engineering responsibilities and tasks involved in MDO helps to facilitate the implementation process. It will be further elaborated that educating active engineers with MDO knowledge is an expensive and time-consuming process for industries. Therefore, a guideline for CMDO implementation in conceptual design is proposed in this thesis that can be easily followed by design engineers with limited prior knowledge in MDO. The performance of the framework is evaluated in a number of case studies including applications such as aircraft design and the design of a tidal water power plant and by engineers in industry and student groups in academia.

Proceedings of the ... ASME Design Engineering Technical Conferences, 2006 **Aerospace America**, 2003 **Global Business** Mehdi Khosrowpour, Information Resources Management Association, 2011-01-01. This multi-volume reference examines critical issues and emerging trends in global business with topics ranging from managing new information technology in global business operations to ethics and communication strategies. Provided by publisher *40th AIAA Aerospace Sciences Meeting & Exhibit*, 2002 *Government Reports Announcements & Index*, 1996-09 *Stanford Bulletin*, 2006 **International Aerospace Abstracts**, 1998 **AIAA Aerospace Sciences Meeting and Exhibit, 42nd**, 2004 **Aeronautical Engineering: A Cumulative Index to a Continuing Bibliography (supplement 274)**, 1992 **Government Reports Annual Index**, 1994 *Journal of Aircraft*, 2009 *34th Aerospace Sciences Meeting & Exhibit*, 1996 **CAD/CAM Abstracts**, 1990 *Reliability and Robust Design in Automotive Engineering 2006*, 2006. Collection of

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