



最適化と総合的な設計入門

Introduction to Optimization and Multidisciplinary Design

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本書の内容

Innovative optimization and design techniques for modern aircraft (manned or UAV/UCAV) and engine systems aiming at maximum performance in a multidisciplinary context (aerodynamic efficiency, safety, drag, losses, weight, strength, heat fluxes, emission, noise, ...), are now rapidly moving from research labs to industrial real and virtual platforms. To reach concurrently this level of excellence, emergent optimization methodologies require more and more robust and efficient associated software for a daily use in industrial collaborative design environments.

These course notes provide the basic concepts and tools behind this technology, both in single discipline (single point or multi point design) and multidisciplinary (fluid-structure interaction, fluid-acoustics, conjugate heat transfer, ...) context. Subjects which are treated in detail include: gradient based and steepest descent methods, adjoint methods, one shot or goal oriented methods, evolutionary/differential evolution algorithms on parallel environments, game strategies like Pareto Fronts and Nash Equilibrium, parameterization, surrogate and reduced-order modeling (Radial Basis functions, Artificial Neural Networks, Kriging ...), multifidelity modeling approaches, robust design, ...

The content of these proceedings is oriented towards junior and experienced engineers and researchers involved in the field of multidisciplinary design and looking for innovative numerical solutions - or set of solutions- for complex multi criteria optimization problems.

The Lecture Series directors are J. Périaux from CIMNE/Univ. Politecnica de Catalunya, Spain and T. Verstraete from the von Karman Institute.

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