Computational Approaches for Aerospace Design: The Pursuit of Excellence

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Wiley, 2005. Book Condition: New. Brand New, Unread Copy in Perfect Condition. A+ Customer Service! Summary: Foreword.Preface.Acknowledgments.I Preliminaries.1 Introduction.1.1 Objectives.1.2 Road Map -What is Covered and What is Not.1.3 An Historical Perspective on Aerospace Design.1.4 Traditional Manual Approaches to Design and Design Iteration, Design Teams.1.5 Advances in Modeling Techniques: Computational Engineering.1.6 Trade-offs in Aerospace System Design.1.7 Design Automation, Evolution and Innovation.1.8 Design Search and Optimization (DSO).1.9 The Take-up of Computational Methods.2 Design-oriented Analysis.2.1 Geometry Modeling and Design Parameterization.2.2 Computational Mesh Generation.2.3 Analysis and Design of Coupled Systems.3 Elements of Numerical Optimization.3.1 Single Variable Optimizers - Line Search.3.2 Multivariable Optimizers.3.3 Constrained Optimization.3.4 Metamodels and Response Surface Methods.3.5 Combined Approaches - Hybrid Searches, Metaheuristics.3.6 Multiobjective Optimization.3.7 Robustness.II Sensitivity Analysis and Approximation Concepts.4 Sensitivity Analysis.4.1 Finite-difference Methods.4.2 Complex Variable Approach.4.3 Direct Methods.4.4 Adjoint Methods.4.5 Semianalytical Methods.4.6 Automatic Differentiation.4.7 Mesh Sensitivities for Complex Geometries.4.8 Sensitivity of Optima to Problem Parameters.4.9 Sensitivity Analysis of Coupled Systems.4.10 Comparison of Sensitivity Analysis Techniques.5 General Approximation Concepts and Surrogates.5.1 Local