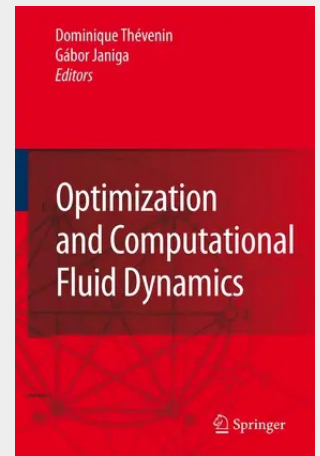


Optimization and Computational Fluid Dynamics

The numerical optimization of practical applications has been an issue of major importance for the last 10 years. It allows us to explore reliable non-trivial configurations, differing widely from all known solutions. The purpose of this book is to introduce the state-of-the-art concerning this issue and many complementary applications are presented.

The idea of this book was born during the "Conference on Modelling Fluid Flow" held in Budapest at the beginning of September 2006. During this occasion, we had decided to propose and thus hold a workshop entitled "Coupling CFD with Optimisation", based on our rapidly increasing experience with this highly interesting topic. We were nevertheless surprised to see the resonating enthusiasm displayed throughout the workshop by the conference participants. From the discussions with all the speakers present at this workshop as well as the survey of the scope of the available books and review articles on this subject, it became easier to understand this great interest. While there is a wealth of new research projects that deal with the coupling of Computational Fluid Dynamics (CFD) and modern Optimization techniques, it is however difficult to find reference publications on this topic. There are indeed a few, excellent books available (see also the Introduction), but they are mostly restricted to aerodynamics, since this has been the first field of CFD for which optimization has become a tool of major importance. Moreover, the connection between CFD and Evolutionary Algorithms, often required when considering more complex systems of equations and physical models, has not been documented extensively.



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