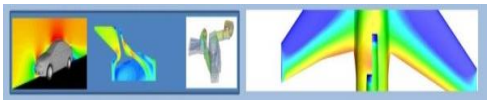


Design Optimization
FOI, Stockholm, Sweden, 28-29 May 2015

Course Coordinator: Prof. K. Giannakoglou, National Techical University of Athens, Greece

Rationale

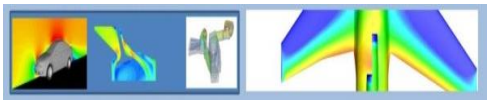
Several years ago, and in recognition of the growing importance of "Design Optimization" to industrial CFD/CSM applications, ERCOFTAC has established a Special Interest Group, called SIG34. SIG34 now offers a course on "Design Optimization" providing an information platform to supporting and fostering a comprehensive exchange between science and industry. Nowadays, computational optimization is both an emerging and widely-used technology in a variety of industrial sectors. Motivated by the maturity of the design-optimization methods and software as well as the advent of powerful modern computational platforms, new automated design optimization methods have already been applied to numerous problems, e.g. in Computational Structural Mechanics (CSM), Computational Fluid Dynamics (CFD), Electro-magnetics, Propulsion, Energy Management and many others. Moreover, combinations of these areas as so-called multi-disciplinary approaches (e.g. fluid-structure interaction, fluid-electro-magnetics interaction) are in use for achieving improvements in "real-world" industrial designs.

Since "traditional" optimization methods often require a significant number of solution points in the design space in order to reach an improved (or optimal) design, substantial effort has been devoted to device efficient search strategies. Moreover, they have already been adapted to multi-objective and multi-disciplinary problems in order to cope with real-world engineering applications.

Aims

The course will provide:

- An overview of modern design optimization methods
- Comprehensive discussions on the presented methods including their pros and cons, assisting industrial engineers to select the best-suited approach for solving their particular problems.
- Based on the latter topic, successfully treated examples in the areas of aeronautics, the automotive, and the turbo-machinery industry will be presented and thoroughly discussed

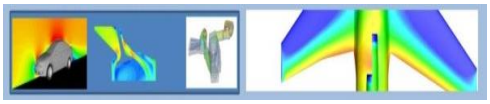


THURSDAY MAY 28, 2015

9:00	Welcome – Introduction to the course	Prof. K.Giannakoglou & FOI
9:20	Introduction to gradient-free methods	Prof. T.Verstraete
10:20	**Coffee Break**	
10:50	Multi-objective EAs accelerated by metamodels - Applications	Prof. T.Verstraete
11:40	Asynchronous, Hierarchical, Distributed Metamodel-assisted EAs - Applications	Prof. K.Giannakoglou
12:30	**Lunch**	
13:30	Hierarchical Optimization based on EAs and Examples in Aeronautics	Dr. M.Nicolich
14:15	Introduction to Gradient-based Optimization	Prof. N.Gauger
15:15	**Coffee Break**	
15:35	Discrete Adjoint	Prof. N.Gauger
16:35	Continuous Adjoint	Prof. K.Giannakoglou

FRIDAY MAY 29, 2015

9:00	Discrete Adjoint & Industrial Applications	Prof. N.Gauger
9:45	Continuous Adjoint & Industrial Applications	Prof. K.Giannakoglou
10:30	**Refreshments**	
11:00	Applications of optimization in the turbomachinery industry	Dr. M.Meyer
12:00	Applied aircraft aerodynamic design optimization	Dr. O.Amoignon
12:30	**Lunch**	
13:30	Topology optimization in solid and fluid mechanics	Prof. A.Klarbring
14:10	Design Optimization of Devices Guiding Acoustic and Electromagnetic Waves	Dr. M.Berggren
14:50	Industrial Application of Aerodynamic Shape Optimization at Saab Aeronautics	Dr. Per Weinerfelt
15:30	Discussion – Round Table - Closure	Dr. M.Meyer Prof. K.Giannakoglou



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Fees:
Student Members €390, Members €590
Non-Members €850
Please note, fees do NOT include accommodation

Registration: **richard.seoud-ieo@ercoftac.org**

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