Integrated Multiphysics Simulation & Design Optimization

Short Course on Methods and Tools for Multiphysics Design Optimization

Laajavuori Rantasipi, Finland
March 13–14, 2009

Scientific Content of the Short Course

This Short Course will consist of a broad review of theoretical and practical optimization including CAD systems, mesh quality, solvers and optimizers ranging from theoretical optimization, control and design concepts to real applications. It intends to provide the basic concepts and tools for single discipline and multidisciplinary optimization. The content of this Short Course is oriented towards young engineers and scientists recently involved in the field of multi disciplinary design as well as professional engineers looking for innovative numerical solutions of complex multi criteria design optimization problems.

Scientific & Technical Organizing Committee:

J. Alonso, Stanford, USA, W. Fitzgibbon, Univ. of Houston, USA, J. Järvinen, CSC, Finland, M. Korkiakoski, Tekes, Finland, P. Neittaanmäki, JYU, Finland, J. Periaux, JYU, Finland, J. Rahola, Nokia, Finland and O. Ventä, VTT, Finland

Organized by SCOMA Center, University of Jyväskylä, in association with CSC, VTT and Stanford / MIT Consortium for Multidisciplinary System Design

Sponsored by TEKES FIDIPRO PROGRAM

www.mit.jyu.fi/scoma/MDO2009

Short Course Invited Lecturers

- **J. Alonso, Stanford, USA**
- **K. Deb, IIT Kanpur, India, Helsinki School of Economics, Finland**
- **F. Hecht, LJLL-UPMC, France**
- **J. Periaux, JYU, Finland**
- **O. Pironneau, LJLL-UPMC , France**

Timetable

Time **Friday March 13**

Session 1:
Chairman P. Neittaanmäki

9:00 **Welcome Address**
JYU, Stanford

9:10 **K. Deb**
Scope of Optimization in Practice and Niche of Evolutionary Methodologies

10:00 Coffee break

Session 2:
Chairman J. Periaux

10:30 **O. Pironneau**
Two Algorithms for Optimal Shape design

11:20 **J. Alonso**
Multi-disciplinary Design, Analysis, and Optimization (MDAO): State of the Art and and Current and Future Research Directions

12:10 Lunch at Laajavuori

Session 3:
Chairman K. Miettinen

13:30 **J. Periaux**
Methods and tools for Multidisciplinary Design Optimization in Aerospace Engineering Using Evolutionary Algorithms, Game Theory and Hierarchical Topology

14:20 **K. Deb**
Principles and Methodologies of Multi-Criterion Problem Solving

15:10 Coffee Break

Session 4:
Chairman O. Pironneau

15:40 **F. Hecht**
Study of the influence of mesh quality on Design Optimization procedures: some examples

16:30 End of day 1

19:00 Dinner at Laajavuori

Time **Saturday March 14**

Session 5:
Chairman W. Fitzgibbon Univ. Houston

9:00 **J. Alonso**
Approaches to Include High-Fidelity Methods in MDAO

9:50 **O. Pironneau**
Parallel Computing and Shape Optimization

10:40 Coffee break

Session 6:
Chairman J. Alonso

11:10 **J. Periaux**
Hybridized Games and Evolutionary Algorithms for Solving Multi-Objective UCAVs Robust Design Optimization and Inverse Problems

12:00 General Discussion

12:30 End of Day 2

13:30 Lunch at Laajavuori

Afternoon free

End of Short Course