

## FiDiPro DESIGN

The goal of the FiDiPro DESIGN project supported by Tekes is to propose a scientific computing-based road map for the technology transfer of optimization methods and tools for multidisciplinary applications within Finnish industry. In order to master and integrate efficiently CAD systems, adapted finite element meshes and geometry, analyzers, optimizers procedures, and their interfaces, the DESIGN project, conducted jointly with SCOMA and the Mathematical Information Technology Department of the University of Jyväskylä, set up in Finland training, seminars, short courses, database workshops and open industrial days on specific generic problems defined by industry. Concurrently, the FiDiPro project uses as leverage existing SCOMA collaborations of other Centres of Excellence in Finland, Europe, and the USA.

New methods and associated software are investigated, implemented, evaluated, and integrated via a collaborative platform on multidisciplinary problems specified by Finnish industries. Computerized data, installed on a Finnish database from multiphysics optimization test cases, will be available to Finnish industries, as useful references.

## SCOMA Center

The SCOMA Center is a Finnish initiative supported by Tekes to promote and facilitate innovative international multidisciplinary research and technologies with an immediate impact upon society and industry.

This center is a gateway between multidisciplinary technologies and the future knowledge society, facilitated by the unique position of the University of Jyväskylä. SCOMA intertwines mathematical information technologies with human behavioral and societal research groups at the university, and through partnerships with small and large enterprises.

## Registration

Please contact Anu Penttilä for registration and additional information.

**e-mail: [anu.penttila@jyu.fi](mailto:anu.penttila@jyu.fi)**

Detailed information is available from the seminar website

**[www.mit.jyu.fi/scoma/seminar2008](http://www.mit.jyu.fi/scoma/seminar2008)**

## Industrial partners



## 3rd International Seminar on

**“Innovative Scientific Computing for Challenging Multidisciplinary Design and Applications: Methods, Tools and Collaborative Environments”**



**CSC Espoo, Finland  
May 26, 2008**

*Co-organized by*  
**University of Jyväskylä  
DESIGN and SCOMA projects  
CSC - Scientific Computing Ltd.**



## Objectives

The goal of this international seminar is to promote and transfer scientific computing knowledge for solving multidisciplinary applications in Europe, and to foster the collaboration between research and application groups involved in multidisciplinary design and simulation.

One of the seminars major concerns is also to alert and educate young scientists and engineers from universities, research laboratories, and industries who are already using numerical methods for simulation and optimization on how to share knowledge via collaborative teams for the improvement of numerical multidisciplinary technologies.

This seminar supports these important objectives. The scope of the seminar is not limited to industrial applications but deals also with other societal and economical areas, such as life sciences, environmental problems, energy, economics and finances.

## Topics

The lectures will focus on numerical methods and tools for multiscale modelling, simulation, and within optimization, and their use, for multidisciplinary design in collaborative research and industrial environments. Topics include CAD systems, the most recent PLM systems, computational mathematics, computational fluid dynamics, computational mechanics, mesh adaption, a posteriori error estimates, and multiobjective optimization.

## Applications

Multidisciplinary applications will be considered in the following areas: telecommunications, aeronautics, paper machine industry, micro-electronics, energy, material processes, life sciences applications and environmental applications.

## Generalities

Scientific computing for simulation and design is one of the most powerful technologies for industries and society. So far, most technical designs have been single-discipline oriented and based on the expertise of the design engineer or researcher. Nowadays, scientific computing is the daily companion of engineers and scientists in the search for innovative solution(s) to a single-discipline problem.

However, the use of numerical and optimization methods for coupled multidisciplinary problems remains an open challenge in many areas including, in particular, telecommunications, aeronautics, electronics, energy, environment and life sciences. Reducing time and the costs of the design while maintaining accuracy and robustness of algorithms is still of primary concern for the designers.

Considering the decreasing cost of computer hardware and the recent efforts achieved in collaborative environments to master human factors in multidisciplinary research and engineering, innovative methods are now being used in multidisciplinary applications.

## Organizing Committee

- Jari Järvinen, CSC
- Pekka Neittaanmäki, JYU
- Jacques Periaux, JYU

## Scientific/Logistics Secretariat

- Neea Karsten, CSC
- Anu Penttilä, JYU
- Tero Tuovinen, JYU
- Kati Valpe, JYU

## Programme

10.30	Coffee
10.50	J. Järvinen CSC - Scientific Computing Ltd., Finland P. Neittaanmäki University of Jyväskylä, Finland <b>Opening words</b>
11.00	T.J.R. Hughes University of Texas at Austin, USA <b>Isogeometric Analysis: Progress and Challenges</b>
11.45	O. Pironneau UPMC & French Academy of Sciences, France <b>Numerical Zoom for Multi-Scale Problems</b>
12.30	Lunch
13.30	D. Gaillard Dassault Systems Scandinavia, Sweden <b>PLM 2.0 a significant breakthrough in Innovation and Technology</b>
14.15	P. Díez UPC Barcelona, Spain <b>Goal Oriented Error Assessment: Guaranteed Bounds for General Quantities and Approximation of the Dispersion Error</b>
15.00	Coffee
15.15	F. Hecht UPMC-LJLL, France <b>FreeFem++ from 2d to 3d</b>
16.00	J. Periaux University of Jyväskylä, MIT, Finland <b>Closing words</b>

Detailed information is available from the seminar website <http://www.mit.jyu.fi/scoma/seminar2008>

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e-mail: [anu.penttila@jyu.fi](mailto:anu.penttila@jyu.fi).