Annual Seminar in Optimization and Systems Engineering 2011

Tapio Westerlund

CHAIRMAN OF THE OSE GROUP

CENTER OF EXCELLENCE IN
OPTIMIZATION AND SYSTEMS ENGINEERING
ÅBO AKADEMI UNIVERSITY

ÅBO, FINLAND, DECEMBER 8 2011

OSE
OPTIMIZATION AND
SYSTEMS ENGINEERING

ÅA
Åbo Akademi
University

The OSE research group

- ▶ The Optimization and Systems Engineering (OSE) group at Åbo Akademi University is an interdisciplinary research group focusing on theory, methods and algorithms in systems engineering, optimization and statistics, as well as their applications in science and engineering.

- ▶ OSE bridges the systems engineering, systems theory and mathematical disciplines at ÅAU.

- ▶ The group has been appointed a Center of Excellence within research at the university for the time-period 2010–2014.

The OSE research group

Group leaders

Prof. Tapio Westerlund	Prof. Jukka Corander	Prof. Göran Högnäs	Prof. Hannu Toivonen
Process design and systems engineering	Mathematics	Mathematics	Industrial systems engineering

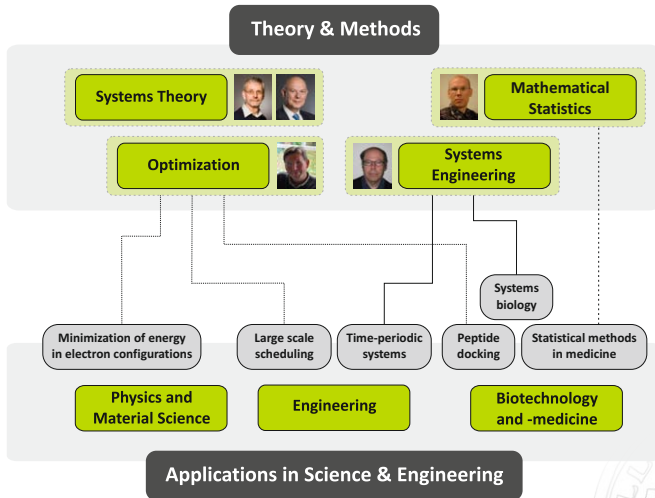| Optimization	Mathematical statistics	Systems theory	Systems engineering

► Currently the group consists of about 25 PhD students and post doctoral researchers.
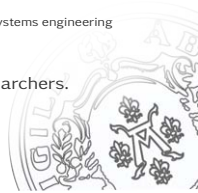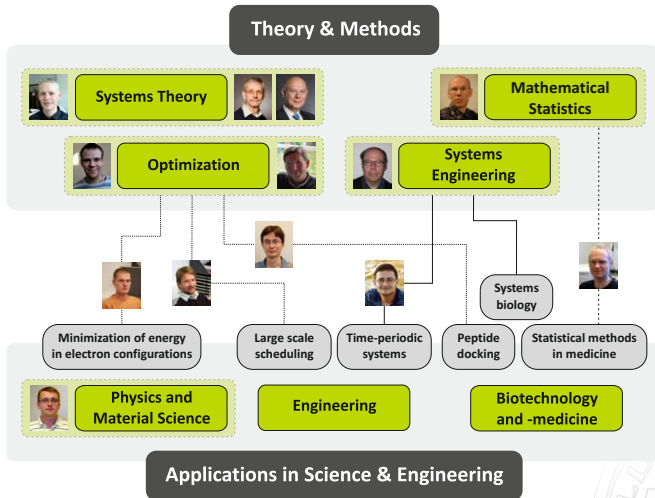
Structure of the OSE group

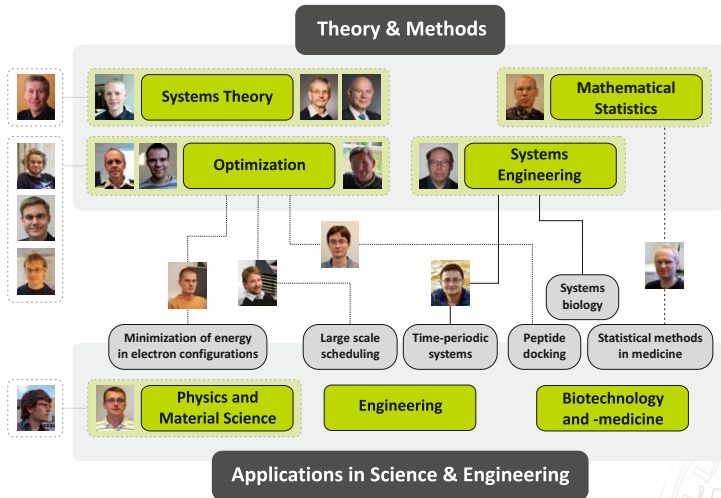*The research areas and group leaders*

Structure of the OSE group

People with direct financing

Structure of the OSE group

People with direct financing and some affiliated researchers

Theory & Methods

Systems Theory

Mathematical Statistics

Optimization

Systems Engineering

Minimization of energy in electron configurations

Large scale scheduling

Time-periodic systems

Peptide docking

Systems biology

Statistical methods in medicine

Physics and Material Science

Engineering

Biotechnology and -medicine

Applications in Science & Engineering

Seminar program

10.00 **Professor Tapio Westerlund**
Chairman of the OSE group
Opening statement

10.05 **Professor Ignacio Grossmann**
Discrete and continuous optimization models for the design and operation of sustainable and robust process systems

10.50 **COFFEE**

10.05 **Professor Ignacio Grossmann**
Relaxations for convex nonlinear generalized disjunctive programs and their application to nonconvex problems

11.50 **LUNCH**
Café Arken

13.15 **Andreas Lundell, PhD**
A reformulation framework for global optimization

13.40 **Ray Pörn, PhD**
On the construction of finite Blaschke products with prescribed critical points

14.05 **Henrik Nyman, PhD student**
Labeled graphical models

14.25 **COFFEE**

14.40 **Mikael Nyberg, PhD student**
A novel approach to include limited equipment connectivity in STN models

15.00 **Anders Skjäl, PhD student**
A generalization of classical αBB under-estimation to include bilinear terms

15.20 **Otto Nissfolk, PhD student**
Solving rank-1 QAPs

15.40 **Axel Nyberg, PhD student**
MILP formulations for the QAP

16.00 **Amir Shirdel, PhD student**
System identification by support vector regression
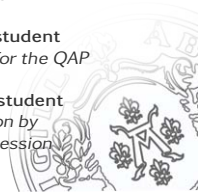
Lunch

Café Arken, Fabriksgatan 2

Invited speaker

Professor Ignacio Grossman, Carnegie Mellon University

► MSc (1975) and PhD (1977) from Imperial College London

► joined Carnegie Mellon University in 1979

► is the Rudolph R. and Florence Dean University Professor of Chemical Engineering and former Department Head at Carnegie Mellon University in Pittsburgh, USA

► selected as one of the "One hundred engineers of the modern era" by AIChE in 2008

► is honorary doctor at Åbo Akademi University (2002) and University of Maribor (2007)

► has published in total over 350 publications and graduated over 40 PhD students during his career

"The goal of Professor Grossmann's work is to develop novel mathematical programming models and techniques for a variety of problems in process systems engineering."