

Scientific Computing

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CBC Workshop on Parameter Identification and Uncertainty in Geo- and Life Sciences - June 14, 2011

Total number of participants: 14
 Total number of guests outside of CBC: 1
 Number of different nationalities represented: 6
 Total number of speakers: 6
 Total number of talks: 6

Agenda

0900-0930: Coffee.

0930-0945: *Sedimentation processes - models, uncertainty and parameter identification* by Stuart Clark
 0945-1030: *Automated computational modeling in the geo- and life sciences* by Achim Scholl
 1030-1050: *Inverse modeling of sedimentation processes* by Lyudmyla Vynnytska

1050-1100: Coffee

1100-1120: *Inverse modeling in biomedical flows* by Kent Andre Mardal
 1120-1140: *Uncertainty quantification via the polynomial chaos methods* by Jonathan Feinberg
 1140-1200: *Uncertainty quantification of a sedimentation process* by Stuart Clark

1200-1330: Lunch and discussion

There will be two guest talks in the afternoon on FEniCS vs DUNE and on modeling of animal populations:

From particle to hydrodynamics descriptions of flocking

by Dr. Trygve Carper from the University of Maryland.

Abstract:

In nature, many groups of individuals organize globally using only local information. For instance, in a school of fish, or in a flock of birds, there are no external forces to coordinate the group, there is no leader to guide them. The global organization emerges solely from the local interactions among individuals.

In this talk, we consider some mathematical attempts at modeling flocking and aggregation phenomena. Starting from some simple rules for each individual we derive particle models. Next, we consider the kinetic equations corresponding to the particle models. Finally, we consider various scaling limits of the kinetic equations leading to hydrodynamic or parabolic descriptions of flocking.

DUNE - introduction and multidomain applications

by our guest research scientist Steffen Müthing from the University of Stuttgart.

Abstract:

DUNE, the Distributed and Unified Numerics Environment, is a C++-based framework for the development of grid-based numerical algorithms for the solution of PDEs. It is based around the ideas of concepts and clearly defined abstractions and relies heavily on C++ template programming.



In this talk, we will give a short introduction to DUNE and the PDELab discretization extension and mention differences to some of the approaches taken by DOLFIN.

Building on that, we

will give a short overview of the extensions that we have developed to extend DUNE and PDELab to handle multi-domain problems, highlighting some advanced DUNE concepts like meta grids.

Finally, we take a short look at the preliminary DUNE-FEniCS integration that was developed in the past weeks.

What	• Workshop
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When	Jun 14, 2011 From 09:00 AM to 01:30 PM
Where	Bakrommet @ Simula
Contact Name	Hans Petter Langtangen
Attendees	Achim Scholl Are Magnus Bruaset Hans Petter Langtangen Jonathan Feinberg Kent Andre Mardal Lyudmyla Vynnytska Marlie Rognes Martin Alnes Rainer Nerlich Stuart Clark Tor Gillberg Trygve Carper Wenjie Wei Xing Cai
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