DRAFT PROGRAMME

The Third International Conference on Parallel, Distributed, Grid and Grid Computing for Engineering

25-27 March 2013
Pécs - Hungary

in association with
Pollack Mihály Faculty of Engineering and Information Technology
University of Pécs

organised by

CIVIL-COMP PRESS

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  period: 3-6 September 2013

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  period: 3-6 September 2013

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  Venue: Ajaccio, Corsica, France
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- The Twelfth International Conference on Computational Structures Technology
  period: Autumn-Fall 2014

- The Ninth International Conference on Engineering Computational Technology
  period: Autumn-Fall 2014

- The Fourth International Conference on Parallel, Distributed, Grid and Cloud Computing for Engineering
  period: Easter 2015

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How to find a paper in the conference proceedings

The conference proceedings are published in three volumes.

The invited lectures are published as follows:

- **volume L: Developments in Parallel, Distributed, Grid and Cloud Computing for Engineering**
  B.H.V. Topping and P. Iványi, (Editors)
  Saxe-Coburg Publications, 2013

- **volume C: Computational Technology Reviews. Volume 7**
  B.H.V. Topping and P. Iványi, (Guest-Editors)
  Saxe-Coburg Publications, 2013
  ISBN 978-1-874672-61-6, ISSN 2044-8430, CTR: 7

The contributed papers are published in a summary volume with the full papers available on the accompanying memory stick as follows:

- **volume P: Proceedings of the Third International Conference on Parallel, Distributed, Grid and Cloud Computing for Engineering**
  B.H.V. Topping and P. Iványi, (Editors)
  Civil-Comp Press, 2013

In this programme the letter immediately preceding a paper title refers to the volume identifier given above. For example: L.1 refers to the first chapter of *Developments in Parallel, Distributed, Grid and Cloud Computing for Engineering* and P.2 refers to the second paper in *Proceedings of the Third International Conference on Parallel, Distributed, Grid and Cloud Computing for Engineering*.

How to reference Civil-Comp Conference papers

Pre-formatted references for all papers in the conference proceedings, past and present, as well as lectures published in Computational Technology Reviews or in the dedicated lecture volumes can be found at www.CTResources.info.

The search mechanism can be used to find the correct publication. Pre-formatted references can then be copied from the individual pages for each paper or lecture.

In the electronic proceedings a link entitled “full reference” is provided for each contributed paper on the contents pages. A similar link is included for each summary. These links will take you to an individual page from which a pre-formatted reference for the paper can be copied.

The typical structure of a reference to a contributed paper is as below. The # mark must be changed into the paper number given on the summary and on the full length paper. No page numbers should be quoted.


Computational Technology Resources

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A note for authors presenting papers and chairmen

All authors should meet at the front of the meeting room for their session at least 10 minutes before the session starts. Each contributed paper has been allocated 15 minutes for presentation and questions. Chairmen should indicate when 10 minutes have passed and again after 12 minutes that the presenter should immediately finish. Three minutes are available for questions and comments.

Invited lectures have been allocated 30 minutes in total, of which 5 minutes may be used for questions.

Authors are kindly asked to keep to the time allocated to them by the Chairmen. Authors are discouraged from using their own laptops unless absolutely necessary, in which case they should ensure that they can quickly and efficiently start their presentation when requested by the Chairman.

Chairmen are requested to keep to the timetable. Changes to the programme will be indicated on the copies of the programme displayed on the conference timetable board and at the entrance to each of the rooms.

As a courtesy and in politeness to all speakers and other participants, please turn off your mobile phone whenever you enter any of the meeting and lecture rooms.

Journal special issue submission

For details of the format specification and procedures for submitting conference papers for possible publication in the journal special issues, please visit:

Web page will be available in the final programme

Authors should consult this webpage before preparing a paper for journal special issue submission.

Papers that do not comply with instructions given on this page, or that are submitted after the deadline, cannot be considered for publication in the journal special issues.

Conference Venue

The conference venue is:
Pollack Mihály Faculty of Engineering and Information Technology
University of Pécs, Boszorkány u 2, Pécs, H-7624, Hungary

Conference Timetable

Day 1: Monday 25 March 2013
08.45-17.00: Conference Desk open
09.45-12.15: Opening session in Room 007 (see page 10)
12.15-13.30: Lunch (admission by Conference Badge) see map on page 19
13.30-15.30: Parallel Sessions Rooms 007 & 008
15.30-16.00: Coffee / Tea
16.00-17.30: Parallel Sessions Rooms 007 & 008
19.30: Coaches leave for the Villanyi Wine Tasting and Dinner (Coaches leave from the Barbakan in Barbakan Ter. For the 50Km drive to Villanyi. Please see the map at the Conference Desk for the location of the Barbakan)
23.00: Estimated return time from the Villanyi Wine Tasting event

Day 2: Tuesday 26 March 2013
08.45-17.00: Conference Desk open
09.00-10.30: Parallel Sessions Rooms 007 & 008
10.30-11.00: Coffee / Tea
11.00-12.30: Parallel Sessions Rooms 007 & 008
12.30-13.30: Lunch (admission by Conference Badge) in the Foyer of the Faculty Building
13.30-15.30: Parallel Sessions Rooms 007 & 008
15.30-16.00: Coffee / Tea
16.00-17.00: Session Room 007
19.30: Coaches leave for the Conference Dinner (Coaches leave from the Barbakan in Barbakan Ter. for the 30Km drive to the Dinner venue. Please see the map at the Conference Desk for the location of the Barbakan)
23.30: Estimated return time from the Conference Dinner

Day 3: Wednesday 26 March 2013
08.45-12.00: Conference Desk open
09.00-10.30: Parallel Sessions in Rooms 007 & 008
10.30-11.00: Coffee / Tea
11.00-12.30: Parallel Sessions in Rooms 007 & 008
12.30-13.30: Lunch (admission by Conference Badge) in the Foyer of the Faculty Building
Opening Session

O. Hassan
L.1

Special Session:
PRACE in Engineering
P.10-P.15

B. Balachandran
L.5

Special Session:
GPU Computing Systems
P.25-P.28

Non-Overlapping Domain Decomposition Methods in Engineering
Session organised by J. Kruis and T. Kozubek
P.1-P.3

Non-Overlapping Domain Decomposition Methods in Engineering
Session organised by J. Kruis and T. Kozubek
P.4-P.9

Visualization
P.51

Distributed Computing
P.52

Networks
P.53

Message Passing Interface
P.54

Computational Fluid Dynamics
P.42-P.45

M. Krafczyk
L.6

G. Houzeaux
L.8

Finite and Discrete Element Analysis
P.37-P.41

W.E. Johnston
L.3

J. Erhel
L.7

J. Kruis
L.4

D. Rypl
C.3

W.J. Knottenbelt
L.9

F. Magoulès
L.10

O. Coulaud
L.11

P. Spiteri
L.12
Opening Session

9.45-10.45:

Welcome
Musical Interlude
Group photograph

10.45-11.15: Coffee

11.15-12.15:

Opening Plenary Lecture

L.1 Computational Fluid Dynamics Applied to the Aerodynamic Design of a Land Based Supersonic Vehicle
O. Hassan, B. Evans, J.G. Araya and K. Morgan

Professor O. Hassan
Swansea University, United Kingdom
13.30-15.30: Chaired by: C. Moulinec & D.R. Emerson

Invited Lecture
L.2 Challenges to be Overcome for Engineering Software to Run Efficiently on Petascale Machines
C. Moulinec, D.R. Emerson, Y. Fournier and P. Vezolle

PRACE in Engineering
Session organised by C. Moulinec
P.10 A Parallel Mesh Generator based on Sequential NETGEN
Y. Yilmaz and C. Ozturan
P.11 Parallel Mesh Multiplication and its Implementation in Code_Saturne
A. Ronovsky, P. Kabelikova, V. Vondrak and C. Moulinec
P.12 Testing, Deploying, and Evolving the Code_Saturne CFD Toolchain for Bil lion-Cell Calculations
Y. Fournier, C. Moulinec and P. Vezolle
P.13 Enabling a Computational Mechanics Code for Massively Parallel Supercomputers
X. Sáez, E. Casoni, G. Houzeaux, M. Vázquez and A. Jerusalem
P.14 Parallel Performance of Fast Fourier Transform Routines in PRACE
A. Sunderland, C. Moulinec and R. Sandberg
P.15 Engineering Problems solved using OpenFOAM
T. Karasek and T. Brzobohaty

15.30-16.00: Coffee

16.00-17.30: Chaired by: C. Janna & G.A. Gravvanis

Invited Lectures
C.4 A Survey of the Parallelization Issues for Geometric and Algebraic Multigrid Methods based on Generic Banded Approximate Inverses
G.A. Gravvanis, C.K. Filelis-Papadopoulos and P.I. Matskanidis
C.2 Approximate Inverse Preconditioning for the Solution of Large Sparse Linear Systems
C. Janna, M. Ferronato and G. Gambolati

Special Session:
Parallel Solution of Sparse Linear Systems Arising in Engineering Applications
Session organised by C. Janna
P.21 Approximate Inverse Preconditioning for the Conjugate Gradient Method
J. Kopal, M. Rozlozník and M. Tuma
P.22 Parallel Structurally-Symmetric Sparse Matrix-Vector Products on Multi-Core Processors
G.O. Ainsworth Jr., V.H.F. Batista and F.L.B. Ribeiro
P.23 Using Compensated Algorithms to Improve the Accuracy of a Parallel Hydrodynamic Software Suite
S. Montan, C. Denis, D.R. Emerson and C. Moulinec
P.24 A Parallel Block Preconditioner for Coupled Simulations of Partially Saturated Soils in Finite Element Analyses
G. Bui, J. Stascheit and G. Meschke

15.30-16.00: Coffee

16.00-17.00: Chaired by: M. Dolenc & P.S. Rakic

Visualization
P.51 Analysis of Crack Geometry using Distributed Visualization Software
A. Kaceniuskas, R. Pacevic and D. Markauskas

Distributed Computing
P.52 ISES Virtual Energy Lab: Requirements and Early Design
M. Dolenc, R. Klinec and P. Katranuschkov

Networks
P.53 Scalable Event Detection in Wireless Sensor Networks using a Novel Content-Based Pattern Recognition Scheme
A.H. Basirat and A.I. Khan

Message Passing Interface
P.54 C++ Statically Typed Matrix in Parallel Application Programming
Day 2: Tuesday 26 March 2013: AM  
Room 007

09.00-10.30: Chaired by: J. Kruis and T. Kozubek

Invited Lecture

C.1 Acceleration of Convergence for Domain Decomposition Methods  
L. Berenguer, T. Dufaud and D. Tromeur-Dervout

Non-Overlapping Domain Decomposition Methods in Engineering  
Session organised by J. Kruis and T. Kozubek

P.1 On Generalized Inverses in Solving Two-By-Two Block Linear Systems  
T. Kozubek and A. Markopoulos

P.2 The Hybrid Total FETI Method  
T. Brzobohatý, M. Jarošová, T. Kozubek, M. Menšík and A. Markopoulos

P.3 A Comparison of Different Parallel Solvers for Linear Systems of Equations based on Domain Decomposition  
D. Horak and V. Hapla

10.30-11.00: Coffee

11.00-12.30: Chaired by: J. Kruis and T. Kozubek

Non-Overlapping Domain Decomposition Methods in Engineering  
Session organised by J. Kruis and T. Kozubek

P.4 A Parallel Library for Level Set Methods with Application to Contact Mechanics  
P. Kotas, V. Vondrak, R. Croce, V. Poletti and R. Krause

P.5 Mortar Contact Approximation Preserving Scalability of the FETI Algorithm  
O. Vlach, Z. Dostál, T. Kozubek and T. Brzobohatý

P.6 A Comparison of FETI Natural Coarse Space Projector Implementation Strategies  
V. Hapla and D. Horak

P.7 Modelling Slip Surfaces in Soils and their Solution using the FETI Method  
T. Koudelka and J. Kruis

P.8 Parallel Implementation of the Total-FETI Domain Decomposition Method for the Solution of Elasto-Plastic Problems  
M. Merta and M. Cermák

P.9 Nonlinear Transmission Conditions for Schwarz and Dual Schur Complement Time Domain Decomposition  
P. Linel and D. Tromeur-Dervout

Day 2: Tuesday 26 March 2013: AM  
Room 008

09.30-10.30: Chaired by: M. Krafczyk and G. Houzeaux

Computational Fluid Dynamics

P.42 Parallel Algorithms for Smoothed Particle Hydrodynamics and Dissipative Particle Dynamics  
M. Ivanovic, N. Filipovic, B. Stojanovic and M. Kojic

P.43 Parallel Hybrid Continuum-Molecular Method for Micro-Fluid Dynamics  
A. Povitsky and S. Zhao

P.44 Calculating the Efficiency of a Cyclonic Separator using Computational Fluid Dynamics  
I. Haber

P.45 Parallelization of the Direct Simulation Monte Carlo Method using the Partitioned Global Address Space Paradigm  
N. Sengil

10.30-11.00: Coffee

11.00-12.15: Chaired by: M. Krafczyk and G. Houzeaux

Invited Lectures

L.8 A Parallel Incompressible Navier-Stokes Solver: Implementation Issues  
G. Houzeaux, H. Owen, B. Eguzkitza, C. Samaniego, R. de la Cruz, H. Calmet, M. Vázquez and M. Ávila

L.6 HPC CFD Simulations Based on Kinetic Methods Using Multi- and Many-Core Systems  
M. Krafczyk, S. Uphoff, M. Schnherr, M. Geier, K. Kucher and M. Stiebler
## Day 2: Tuesday 26 March 2013: PM
### Room 007

### 13.30-15.30: Chaired by: J. Erhel and W.E. Johnston

### Invited Lectures

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>L.3</td>
<td>Today’s Large-Scale Science depends on Network Data Movement based on Twenty Five Years of Technology Development W.E. Johnston, E. Dart and B. Tierney</td>
</tr>
<tr>
<td>L.7</td>
<td>Solving Partial Differential Algebraic Equations and Reactive Transport Models J. Erhel, S. Sabit and C. de Dieuleveult</td>
</tr>
</tbody>
</table>

### 15.30-16.00: Coffee

### 16.00-17.15: Chaired by: P. Iványi and D. Rypl

### Invited Lectures

<table>
<thead>
<tr>
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<tr>
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<td>L.12</td>
<td>Stopping Criteria for Parallel Asynchronous Iterations for Fixed Point Methods J.C. Miellou and P. Spiteri</td>
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### 15.30-16.00: Coffee

## Day 2: Tuesday 26 March 2013: PM
### Room 008

### 13.30-15.30: Chaired by: W.J. Knottenbelt and P. Spiteri

### Invited Lectures

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### 15.30-16.00: Coffee
09.15-10.30: Chaired by: J. Brozovsky and P.S. Rakic

Computational Mechanics
P.46 Reliability of Reinforced Concrete Bridge Decks with Respect to Ingress of Chlorides
J. Brozovsky and P. Konecny
P.47 Cloud Computing based MPI/OpenMP Parallelization of the Harmonic Coupled Finite Strip Method applied to Large Displacement Stability Analysis of Prismatic Shell Structures
P.48 Multigrid using Adaptive Unstructured Meshes for Massively Parallel Computation
H. Digonnet
P.49 Unified Design for Parallel Execution of Coupled Simulations using the Discrete Particle Method
X. Besseron, F. Hoffmann, M. Michael and B. Peters

Computational Steering and Control
P.50 Towards Interactive HPC: Sliding Window Data Transfer
R.-P. Mundani, J. Frisch and E. Rank

10.30-11.00: Coffee

11.00-12.15: Chaired by: M. Leps

The Use of High Performance Computing to Solve Intractable Problems with Metaheuristic Algorithms
Session organised by M. Lepš
P.16 Accelerated Reconstruction of Random Heterogeneous Media using Graphics Processing Units
J. Havelka, J. Sýkora and A. Kucerová
P.17 Synthesis of Microstructural Fields using Extended Wang Tile Sets and Parallel Computing
L. Zrubek, J. Krus, J. Novák and A. Kucerová
P.18 Searching for Minimax Designs of Experiments: A Parallel Evolutionary Approach
E. Myšáková and M. Lepš
P.19 Topological Optimization using an Estimation of Distribution Algorithm and the Empirical Selection Distribution
S.I. Valdez, M. Vargas, S. Botello and A. Hernández
P.20 Parallel Branch and Bound Method for Size Optimization Benchmarks
A. Pospíšilová and M. Lepš
Conference venue layout