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Seventh International Conference on  
Engineering Computational Technology**

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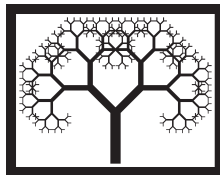
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*Edited by*

**B.H.V. Topping, J.M. Adam, F.J. Pallarés  
R. Bru and M.L. Romero**



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**Escuela Técnica Superior de Ingeniería del Diseño**

*im<sup>2</sup>*

*Instituto de Matemática Multidisciplinar*

# Preface

This volume comprises the summaries of contributed papers presented at The Seventh International Conference on Engineering Computational Technology (ECT 2010) held in Valencia, Spain from 14 to 17 September 2010. The full papers from the conference are available on the accompanying CD-ROM. The ECT conference series began in Edinburgh during 1998. The 2010 conference was held concurrently with The Tenth International Conference on Computational Structures Technology (CST 2010).

The special sessions included in this volume of proceedings are:

- Parallel and Distributed Engineering Computations  
*organised by J. Kruis and P. Iványi*
- Numerical and Computational Linear Algebra  
*organised by F. Pedroche and R. Bru*
- Numerical Algorithms for Solving Nonlinear Systems  
*organised by J.R. Torregrosa*
- Reduced Modelling in Computational Science and Engineering  
*organised by F. Chinesta and E. Cueto*
- Computational Analysis for Automotive Applications  
*organised by R. Citarella*
- Mesh Generation  
*organised by J. Sarrate Ramos and J.M. Escobar*
- Mechanical Design and Manufacturing Simulation for Transport Structural Components  
*organised by R. Citarella*
- Object Oriented Finite Element Methods  
*organised by B. Patzák*
- Flow and Electromagnetic Fields in Materials Modelling  
*organised by K.A. Pericleous*
- Virtual Modelling and Visualisation  
*organised by A.K. Noor*

We are particularly grateful to the organisers of these special sessions.

The following sessions are also included in this volume:

- Computational Modelling and Simulation
- Numerical Techniques in Engineering
- Construction, Maintenance, Project and Planning Engineering
- Information and Database Systems
- Genetic, Evolutionary and other Algorithms inspired by Nature
- Neural Networks
- Data Mining

- Computer Aided Design
- Internet Applications
- Finite Element Methods
- Discrete Element Methods
- Boundary Element Methods
- Meshless Methods
- Nanomechanics
- Micro-Scale Modelling
- Micro-Electro-Mechanical Systems
- Materials Modelling
- Multi-Scale Problems
- Multi-Physics Problems
- Inverse Problems
- Heat Transfer Studies
- Computational Mechanics of Granular Media
- Porous Media
- Geotechnical Engineering
- Soil-Structure Interaction
- Tunneling
- Medical and Bioengineering
- Computational Fluid Dynamics
- Fluid-Structure Interaction
- Shallow Water Problems
- Hydrology
- Traffic and Transport Engineering
- Environmental Engineering

Other papers presented at the conferences in 2010 are published as follows:

- *The Review Lectures from CST 2010 and ECT 2010 are published in:* Computational Technology Reviews, Volumes 1 and 2, Saxe-Coburg Publications, Stirlingshire, Scotland, 2010.
- *The Invited Lectures from CST 2010 are published in:* Developments and Applications in Computational Structures Technology, B.H.V. Topping, J.M. Adam, F.J. Pallarés, R. Bru and M.L. Romero, (Editors), Saxe-Coburg Publications, Stirlingshire, Scotland, 2010.
- *The Invited Lectures from ECT 2010 are published in:* Developments and Applications in Engineering Computational Technology, B.H.V. Topping, J.M. Adam, F.J. Pallarés, R. Bru and M.L. Romero, (Editors), Saxe-Coburg Publications, Stirlingshire, Scotland, 2010.
- *The Contributed Papers from CST 2010 are published in:* Proceedings of the Tenth International Conference on Computational Structures Technology, B.H.V. Topping, J.M. Adam, F.J. Pallarés, R. Bru and M.L. Romero, (Editors), (Book of Summaries with a CD-ROM of full-text papers), Civil-Comp Press, Stirlingshire, Scotland, 2010.

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We are grateful to Jelle Muylle for designing these conference proceedings and for all his administrative and organisational skills in organising these conferences. We also wish to thank Dawn Sewell (Civil-Comp Press) for her administrative support before and during the conference.



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