I
C
C
M
2
0
1
2

# 4th International Conference on Computational Methods

## 25 - 28 November 2012

### Crowne Plaza Surfers Paradise

### Gold Coast | Australia

# Conference Handbook

sgi QUT qcif

## Date: 27 November 2012 – Waratah Room

**MS-06 (2): Recent Development (or Advanced Topics) on Optimisation and Control of Mechanical and Structural Systems**
**Chair: *Dr Zhen Luo / Dr Jinchen Ji***

| Time | ID | Author* | Title |
|------|-----|---------|-------|
| 10:30-10:50 | **65 Keynote** | Xiaodong Huang | Two-scale Concurrent Topology Optimization for Microstructures of Materials and Structures |
| 10:50-11:10 | 57 | Zhen Luo | A Chebyshev meta-model for interval uncertain optimization of suspensions |
| 11:10-11:30 | 58 | Pipit Nugroho | A New Adaptive Fuzzy-Hybrid Control Strategy of Semi-Active Suspension with Magneto-Rheological Damper |
| 11:30-11:50 | 75 | Seok Heum Baek | Design Optimization of the Electromechanical Actuator for Automatic Transmission Using Multiple Surrogate Models |
| 11:50-12:10 | 61 | Zhen Luo | Interval analysis method for dynamics systems with uncertain parameters |
| 12:10-12:30 | 68 | Moucun Yang | Euro-trough Solar Concentrator optimization design based on variable cross section beam |

**MS-08 (2): High-order numerical methods for solving PDEs**
**Chair: *Prof T. Tran-Cong***

| Time | ID | Author* | Title |
|------|-----|---------|-------|
| 14:20-14:40 | 100 | Cheng-Yu Ku | A Perturbed Scalar Homotopy Method for Solving Groundwater Problems with Singular Initial Conditions |
| 14:40 - 15:00 | 101 | Yun-Che Wang | Velocity-stress formulation of 2D linear elastic and viscoelastic systems for resonant ultrasound spectroscopy |
| 15:00-15:20 | 102 | Arpiruk Hokpunna | SIP-Multigrid method in Fourth-Order Finite Volume Method for Navier-Stokes Equations |
| 15:20-15:40 | 104 | Wei Li | Discrete Singular Convolution for Dynamic Response of Free Vibrations of a Rotating Shaft |

**MS-08 (1): High-order numerical methods for solving PDEs**
**Chair: *Prof T. Tran-Cong/ Dr Terry Lin***

| Time | ID | Author* | Title |
|------|-----|---------|-------|
| 16:00-16:20 | **105 Keynote** | T. Tran-Cong | A New IRBFN Scheme for the Numerical Simulation of Interfacial Flows |
| 16:20-16:40 | 92 | N. Thai-Quang | A high-order compact integrated-RBF scheme for time-dependent problems |
| 16:40-17:00 | 93 | T-Tram Hoang-Trieu | Compact local Integrated RBF stencil based on Finite Volume formulation for second-order differential problems |
| 17:00-17:20 | 94 | N. Pham-Sy | Development of Parallel algorithm for Boundary Value Problems using Compact Local Integrated RBFN and Domain Decomposition |
| 17:20-17:40 | 95 | Raj Nawin | Numerical study of nonlinear wave processes by means of discrete chain models |
| 17:40-18:00 | 372 | Fudziah Ismail | Solving Special Second Order Delay Differential Equations Using Hybrid and Runge-Kutta Nystrom Methods |

25 - 28 November 2012, Crowne Plaza, Gold Coast

**4th International Conference on Computational Methods**

# ICCM2012

The ICCM2012 is an international conference providing an international forum for exchange ideas on recent advances in areas related to computational methods, numerical modelling & simulation, as well as their applications in engineering and science.

Conference Handbook

# **PREFACE**

**Dear Colleagues**

On behalf of the organising committee, I am delighted to welcome you to the 4th International Conference on Computational Methods (ICCM2012) at the Gold Coast, Australia.

The ICCM2012 is an international conference providing an international forum for exchange ideas on recent advances in areas related to computational methods, numerical modelling & simulation, as well as their applications in engineering and science. It will accommodate presentations on a wide range of topics to facilitate inter-disciplinary exchange of ideas in science, engineering and related disciplines, and foster various types of academic collaborations. All papers accepted for publication in the proceedings will be subject to a full peer review.

The conference series originated in Singapore in 2004 by Professor GR Liu, followed by ICCM2007 in Hiroshima, Japan, and ICCM2010 in Zhangjiajie, China. This year, the ICCM2012 conference program covers over 260 oral presentations in 48 technical sessions, including 4 Plenary talks, 8 Thematic Plenary talks, and a number of Keynote talks in technical sessions. These presentations cover a broad range of topics of new advances in computational methods and numerical modelling as well as their applications. I hope this conference will become one of the most important actives in the relevant research communities.

I would like to use this opportunity to express my gratitude to the Science and Engineering Faculty of Queensland University of Technology, and all sponsors for their strong support and encouragement. I am deeply indebted to all the members of the Organising Committees, the mini-symposium organisers, the reviewers and the session chair people for your strong support and help. I would like to express my special appreciation and thanks to the Conference General Secretary, Dr. Suvash Saha for his exceptional commitment and tireless work in organising. The last, but not the least, I would like to convey huge thanks to Ms Gabrielle Hunter and Ms Rachel Mortimer from QUT Events for their management of the conference.

I hope that you will have a wonderful time at the beautiful Gold Coast, Australia.

**A/Professor YuanTong (Y.T.) Gu**

Conference Chairman, The ICCM2012
School of Chemistry, Physics and Mechanical Engineering,
Queensland University of Technology,

November 2012

# ORGANISING COMMITTEE

**Chairman:**

A/Prof.   Gu, Y.T.,        Australia

**Honorary Chairs:**

| Prof. | Betts, M., | Australia | Prof. | Yuan, M.W., | China |
| Prof. | Liu, G.R, | USA | | | |

**International organization committee**

**Co-Chairmen:**

| Prof. | Okada, H., | Japan | Prof. | Fan, D.N., | China |
| Prof. | Youn, S.K., | Korea | | | |

**Members:**

| Prof. | Beer, M., | UK | Prof. | Mai-Duy, N., | Australia |
|---|---|---|---|---|---|
| Prof. | Chen, D., | China(Taiwan) | Prof. | Miyazaki, N., | Japan |
| Prof. | Chen, J.T., | China(Taiwan) | Prof. | Ng, T.Y., | Singapore |
| Prof. | Chen, W., | China | Prof. | Nie, Y.F., | China |
| Prof. | Ding, H., | China | Prof. | Nithiarasu, P., | UK |
| Prof. | Du, S.Y., | China | Prof. | Ohayon, R., | France |
| Prof. | Fan,  S.C., | Singapore | Prof. | Rabczuk, T., | Germany |
| Prof. | Feng, X.Q., | China | Prof. | Schaback, R., | Germany |
| Prof. | Fish, J., | USA | Prof. | Shi, G., | Canada |
| Prof. | Fok, A. | USA | Prof. | Soo-Won Chae | Korea |
| Prof. | Gao, Y.Q., | China | Prof. | Tada, N., | Japan |
| Prof. | Gao, Y.W., | China | Prof. | Tian, R., | China |
| Prof. | Gopalakrishnan, S., | India | Prof. | Wan, D.C., | China |
| Prof. | Guan, Z., | UK | Prof. | Wang, C., | China |
| Prof. | Guo,X., | China | Prof. | Wang, D.D., | China |
| Prof. | Hagihara, S., | Japan | Prof. | Watanabe, K., | Japan |
| Prof. | Han, X., | China | Prof. | Wei, G., | USA |
| Prof. | Hon, B.C., | China(HK) | Prof. | Wen, P.H., | UK |
| Prof. | Hu, P. | China | Dr. | Wu, W., | USA |
| Prof. | Idelsohn Barg, S., | Argentina | Prof. | Xiang, Z.H., | China |
| Prof. | Iu, V.P., | China(Macao) | Prof. | Xu, X., | China |
| Prof. | Kajishima, T., | Japan | Prof. | Xuan, Z.C., | China |
| Prof. | Kang, Z., | China | Prof. | Yang, Z., | UK |
| Prof. | Kanok-Nukulchai, W., | Thailand | Prof. | Yoshimura | Japan |
| Prof. | Kant, T., | Japan | Prof. | Yu, T.X., | China(HK) |
| Prof. | Kim, M.K., | Korea | Prof. | Yuan, M.W., | China |
| Prof., | Kitamura, T., | Japan | Prof. | Zhang C.L., | China |
| Prof. | Li, H., | Singapore | Prof. | Zhang X. | China |
| Prof. | Li, M., | China | Prof. | Zhang, C.Z., | German |
| Prof. | Li, S. F., | USA | Prof. | Zhang, H.W. | China |
| Prof. | Liu, M. B., | China | Dr. | Zheng, Y.G., | China |
| Dr. | Liu, Z.S., | Singapore | Prof. | Zhuang, P.H., | China |
| Prof. | Lu, J., | China(HK) | Prof. | Zhuang, Z., | China |
| Prof. | Ma, G. W., | Australia | Prof. | Zong, Z., | China |

**Local organization committee**

**Chairman:**

A/Prof.  Gu, Y.T.,          Australia

**Co-Chairmen:**

| Prof. | Bell, J., | Australia | Dr. | Young, J., | Australia |
|-------|-----------|-----------|-----|------------|-----------|
| Prof. | Turner, I., | Australia | | | |

**Members:**

| Dr. | Chen, G., | Australia | Prof. | Mai-Duy, N., | Australia |
|------|-----------|-----------|-------|--------------|-----------|
| Prof. | Gao, D., | Australia | Prof. | Miller, K., | Australia |
| Prof. | Gao, W. | Australia | Prof. | Oloyede, K., | Australia |
| Prof. | Guan, H., | Australia | Dr. | Senadeera, W., | Australia |
| Dr. | Kelson, N., | Australia | Prof. | Shen, L.M, | Australia |
| Prof. | Khalili, N., | Australia | Prof. | Tan, A., | Australia |
| Prof. | Jiang, Z., | Australia | Prof. | Tong, L.Y., | Australia |
| Prof. | Li, L., | Australia | Prof. | Tran-Cong, T., | Australia |
| Prof. | Li, Q., | Australia | Prof. | Xie, Y.M., | Australia |
| Prof. | Li, W.H., | Australia | Prof. | Yan, C., | Australia |
| Prof. | Lin, W.X., | Australia | Dr. | Yan, W.Y., | Australia |
| Prof. | Liu, F.W., | Australia | Dr. | Yang, J., | Australia |
| Dr. | Luo, Z. | Australia | Prof. | Yang, R. C. H., | Australia |
| Prof. | Ma, G. W., | Australia | Prof. | Yarlagadda, P., | Australia |
| Dr. | Ma, J., | Australia | Dr. | Zhang, G. Y., | Australia |
| Prof. | Ma, L., | Australia | Prof. | Zhang, H., | Australia |

**Conference General Secretary**

Dr.    Saha, S.,          Australia

**Conference Management**

Ms Gabrielle Hunter       QUT Events
Ms Rachel Mortimer       QUT Events

# PLENARY SPEAKERS

Name:        **Professor Joe Monaghan**
Institution: Monash University
Talk Title:  Leonardo da Vinci's turbulent tank and other complex fluid dynamical problems
Web Page:    http://users.monash.edu.au/~jjm/Welcome.html

Name:        **Professor Tayfun Tezduyar**
Institution: Rice University
Talk Title:  Space–Time Computational Fluid–Structure Interaction Techniques
Web Page:    http://www.tafsm.org/~tezduyar/

Name:        **Professor Gui-Rong Liu**
Institution: University of Cincinnati
Talk Title:  Smoothed Finite element Methods: A Review
Web Page:    http://aerospace.ceas.uc.edu/people/people_fac-staff/fac-staff/fac/g_r_liu.html

Name:        **Dr. Eng Lim Goh**
Institution: SGI (Senior Vice President & Chief Technology Officer)
Talk Title:  From High Performance to Data Intensive Computing
Web Page:

# THEMATIC PLENARY SPEAKERS

Name:        **Professor Karol Miller**
Institution: The University of Western Australia
Talk Title:  Real-Time Finite Element and Meshless Methods for Computational Biomechanics for Medicine
Web Page:    http://school.mech.uwa.edu.au/~kmiller/

Name:        **Professor Chwee Teck Lim**
Institution: National University of Singapore
Talk Title:  Cell Mechanics and the Pathology of Human Diseases – Modeling & Experiments
Web Page:    http://www.bioeng.nus.edu.sg/nanolab/nanolab.html

Name:        **Professor Daining Fang**
Institution: Peking University
Talk Title:  Nonlinear electromechanically coupled computational mechanics methods for piezo/ferroelectric materials at multiscales
Web Page:    http://web5.pku.edu.cn/engineering/Faculty/facultyD/Mechanics/2346.htm

Name:           **Professor Xiqiao Feng**
Institution:     Tsinghua University
Talk Title:     Surface wrinkling and morphological evolution of soft materials
Web Page:    http://cnmm.tsinghua.edu.cn/channels/168.html

Name:           **Professor Hiroshi Okada**
Institution:     Tokyo University of Science
Talk Title:     Development of crack propagation analysis software system using the tetrahedral finite element and remeshings
Web Page:    http://www.sut.ac.jp/en/fac/p/index.php?5d1b

Name:           **Professor Sau Cheong Fan**
Institution:     Nanyang Technological University
Talk Title:     Challenges in simulation of break-up of concrete magazine and the debris throw
Web Page:    http://www.cee.ntu.edu.sg/AboutCEE/Faculty%20Directory/Pages/SM_cfansc.aspx

Name:           **Professor Noriyuki Miyazaki**
Institution:     Kyoto University
Talk Title:     Application of Computational Solid Mechanics to Reliability Studies of Electronic Packaging
Web Page:    http://solid.me.kyoto-u.ac.jp/miyazaki_English/miyazaki.html

Name:           **Professor Moubin Liu**
Institution:     Institute of Mechanics, Chinese Academy of Sciences
Talk Title:     SPH modelling of free surface flows with moving rigid objects
Web Page:    http://lho.imech.ac.cn/webch/User_Show.asp?UserID=161