

## ASOR News — February 2013

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### Busy!

February is shaping up as a busy month for OR, with the ANZIAM conference in Newcastle, workshops (see the summary on Page 3) and no less than three seminars between February 8 and February 20.

### Ceyda Oguz's Seminar

The first ASOR seminar of the year was presented by **Ceyda Oguz** on 30 January 2013. Niraj Dayama (a PhD student from IITB-Monash, currently spending time at CSIRO) kindly provides us with the following review.

The quay crane scheduling problem (QCSP) involves the scheduling of quay cranes at container terminals. Typically, a large terminal may handle 300+ vessels per day with a throughput of several thousand containers. Quay cranes are specialized

machines used to move containers from vessels to the berthing area and vice-versa. Besides the upper limit on the available number of cranes at terminals, additional constraints that must be considered in QCSP include the provision of safety margins for physical distances between two cranes. The QCSP is an NP-hard problem and has been studied in the literature for MIP and heuristic approaches. Further, a variant of the QCSP also involves time windows and ready times for container operations.

In the current work, QCSP was modelled using the constraint programming based approach for major aspects including travel times, safety margins and precedence constraints. This model was solved using ILOG CP Optimizer and was found to show marked reduction in computational time as compared to other MIP based algorithms in existing QCSP literature. The robustness of this model was further tested using two separate families of problem data instances for several (10) runs, yielding very low variation in the objective values. The study also discusses extensions of the QCSP with time windows.

### Upcoming Seminars

#### ASOR Melbourne Series

Wednesday 20 February, 6pm, RMIT and Newcastle by Access Grid: Andreas Ernst – *A tutorial on Lagrangian relaxation.*

#### AGR Series (Access Grid Rooms)

Friday 8 February, 4.00 pm AEDT. Gene Abrams – *Leavitt Path Algebras, something for everyone: algebra, analysis, graph theory, number theory.*

Monday 11 February, 3.00 pm AEDT. Keith Devlin – *What do K-12 education, the modern battlefield, the movie Memento, and a 64,000 student Stanford MOOC have in common?*

### 2013 Membership

ASOR Melbourne membership is by calendar year and so renewal information is in the process of being sent to existing members. We will be keeping

subscription amounts low (and for students, free) so as to make sure our membership continues to grow and be exceptionally good value.

## ASOR 2013 Conference

The 22nd National Conference of the Australian Operations Research Society (ASOR 2013) will be held at the Adelaide Convention Centre in Adelaide, South Australia, from Sunday 1 to Friday 6 December 2013. ASOR 2013 will be run in conjunction with the 20th International Congress on Modelling and Simulation (MODSIM 2013) and DORS (the DSTO led Defence Operations Research Symposium). Papers can be submitted through the MODSIM Operations Research stream led by ASOR President Dr Paul Gaertner.

Abstracts are due by April 8 2013. Visit <http://www.mssanz.org.au/modsim2013>.



In the September-October 2012 newsletter we described work in the *Future Grid Forum*. Above is a schematic of an expanded interconnected grid on Australia's East coast, consisting in this case of 509 generation plants and 40 main interconnectors between regions. Both Gurobi and CPLEX are being used to solve generation and transmission design MIP problems as part of the FGF work, in tandem with energy market simulators.

## SOCO 2013

A **Symposium on Combinatorial Optimization** (SOCO 2013) has been announced, for July 8-10, 2013, Yellow Mountain, China. This symposium is part of the "2013 World Congress on Global Optimization" (WCGO 2013). Contributions on theory and applications in all aspects of Combinatorial Optimization are welcome. Accepted papers will be published in the conference proceedings of WCGO 2013, and selected papers will be published in special issues of three international journals. For information regarding submission, registration, key dates, etc., visit <http://wcgo2013.csp.escience.cn/dct/page/1>. For enquiries, contact Sanming Zhou, at the University of Melbourne, on [smzhou@ms.unimelb.edu.au](mailto:smzhou@ms.unimelb.edu.au) or Yukun Cheng, Zhejiang University of Finance and Economics, China on [ykcheng@amss.ac.cn](mailto:ykcheng@amss.ac.cn)

## AMSI Workshop on Mathematics of Transportation Networks

This workshop will bring together researchers from multiple academic disciplines, including mathematics, engineering and computer science, as well as stakeholders from government and industry, to discuss the application of mathematics to the design and operation of transportation networks. Topics covered will include traffic flow theory and simulation, optimization and control, data mining, intelligent transport systems, logistics, and infrastructure planning. To be held on 19-21 June 2013. Visit <http://users.monash.edu.au/~mpetn/> for more information.

## Support for Visiting Researchers

We extend an open invitation to ASOR members and friends to propose topics and speakers for our 2013 series. The schedule for the first half of the year is filling, but not yet full! Please send ideas and expressions of interest to Simon Dunstall at [Simon.Dunstall@gmail.com](mailto:Simon.Dunstall@gmail.com).

Have you got an interstate or international visitor? ASOR Melbourne has committed funds to assist with the costs of visits, in exchange for visitors giving a seminar for the members. Contact your favourite committee member to discuss the opportunities.

## OR Employment Opportunities

### Postdoc Position at CSIRO

A 3-year postdoc position is available in CSIRO's Urban Systems Program within the Division of Ecosystem Sciences (closes 7 Feb 2013) in Melbourne or Brisbane. A post-doctoral researcher will be appointed to undertake physics-based modelling and systems simulation of different future scenarios to identify options and pathways to ensure future delivery of physical urban functions and services such as energy, water, shelter, infrastructure and transport. Working as a key member of a modelling team, the Postdoctoral Fellow will develop integrated scenario projection models for analysing impacts of endogenous and exogenous factors on key indicators of urban sustainability, resilience and productivity. These will also be integrated with geospatial information and tools. The CSIRO contact is Andrew Higgins (who is part of ASOR in Queensland) and details of the position, including essential criteria, are available at <http://csiro.nga.net.au/?jati=3594d31d-a6e7-8cc9-161c-6e3de6d5fe48>

### Victorian Postdoctoral Research Fellowships

The Victorian Government has launched a program to provide up to six Postdoctoral Research Fellowships to local researchers in 2013, to study overseas and bring their expertise home to Victoria.

The three-year Fellowships will provide support for two years overseas in a leading research institute or university, followed by one year with a Victorian company or research organisation.

The Victorian Postdoctoral Research Fellowships will be awarded to early career Victorian researchers in the physical sciences, life sciences (apart from human health and medicine), mathematical sciences, engineering and information and communication technology sectors.

The Fellowships provide an indexed salary of \$71,000 per annum plus superannuation and additional allowances. Applications close on 5 February 2013. More information is available at [www.business.vic.gov.au/vprf](http://www.business.vic.gov.au/vprf).

## Summary of OR workshops and conferences in Australia

**Young Statisticians Conference 2013**, hosted by the Statistical Society of Australia. University of Melbourne, 7th-8th February 2013. <http://www.ysc2013.com> or contact Susanna Cramb ([SusannaCramb@cancerqld.org.au](mailto:SusannaCramb@cancerqld.org.au))

**ANZIAM 2013** is being held at Newcastle City Hall, 3rd-7th February 2013, hosted by CARMA and the University of Newcastle. Register now at <http://anziam2013.newcastle.edu.au/>

**Dynamic Modelling: What Why & How?** Sydney, 18th to 22nd February 2013. Two world expert practitioners and trainers, Nate Osgood, ex MIT, and Andrei Borshchev, from St Petersburg, will be visiting from 18th to 26th Feb 2013. There is a 2 day overview or a 5 day practical training option. Contact [geoff.mcdonnell@unsw.edu.au](mailto:geoff.mcdonnell@unsw.edu.au) for further details

**Workshop on Data-Driven Decision Guidance and Support Systems (DGSS)**, to be held as part of the 28th IEEE International Conference on Data Engineering (ICDE 2012) in Brisbane, Australia, on April 8-12, 2013. <http://dgss.vse.gmu.edu/index.html>

**AMSI Workshop on Mathematics of Transportation Networks** on 19-21 June 2013 brings together researchers and stakeholders from government and industry to discuss the application of mathematics to the design and operation of transportation networks. Visit <http://users.monash.edu.au/~mpetn/> for more information.

**MODSIM 2013 / ASOR 2013**. Adelaide Convention Centre, December 1-6, 2013. The Theme of the conference is Adapting to Change: the multiple roles of modelling. MODSIM 2013 incorporates the 2013 ASOR Conference. <http://mssanz.org.au/modsim2013>

The 4<sup>th</sup> **Freight Logistics Optimisation Workshop (FLOW)**, on 9 December 2013, is a one-day course introducing optimisation to logistics practitioners in industry. Holiday Inn, Flinders Lane, City. FLOW is a joint initiative of CSIRO, ASOR and the Logistics Association of Australia.

## Web Pages of Interest

We are affiliated with FASTS through AMSC. To keep abreast of FASTS activities, consult :

[www.usyd.edu.au/fast](http://www.usyd.edu.au/fast)

ASOR National: [www.asor.org.au](http://www.asor.org.au)

ASOR Melbourne Chapter:

<http://www.melbourne.asor.org.au/>

NZ OR Society <http://www.orsnz.org.nz/>

ORS (UK): <http://www.orsoc.org.uk/>

INFORMS (US): <http://www.informs.org/>

IFORS: <http://www.ifors.org>

Optimisation in Melbourne:

<http://www.or.ms.unimelb.edu.au/>

For the latest international news, conference and jobs details see: <http://www.ifors.org/panorama/index.html>

tutOR: <http://www.tutor.ms.unimelb.edu.au>

## Committee Membership for 2012-2013

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