

# REPORT ON IWOCA 2007

## 18th International Workshop on Combinatorial Algorithms 5–9 November 2007, Lake MacQuarrie, New South Wales, Australia

Bill Smyth

The 18th (or the First) IWOCA took place within the spacious grounds of Rafferty’s Resort on Lake MacQuarrie, Australia’s largest saltwater lake, about 30 km. out of Newcastle, NSW. The meeting was sponsored by The University of Newcastle and hosted by its School of Electrical Engineering & Computer Science. The local Organizing Committee, chaired by Yuqing Lin, did an outstanding job; the Programme Committee was cochaired by Ljiljana Brankovic and the author of this report.

Since its inception in 1989, the *Australian* Workshop on Combinatorial Algorithms (AWOCA) had gradually emerged as an influential regional meeting of mathematicians and computer scientists studying various aspects of the theory and application of combinatorial objects. At AWOCA 2006 (held at Ayres Rock, a well-known Australian world heritage site), the participants met to discuss AWOCA’s future. They proposed internationalizing AWOCA, upgrading its academic profile, making the commitment to publish its Proceedings with an international academic publisher — while at the same time maintaining its traditional problems-oriented flavour. As a result, AWOCA was renamed IWOCA and has for the first time sought venues outside the Australian region (in 2008–2010 it is expected to be held in Japan, China and the Czech Republic, respectively). A new permanent website has been established at <http://www.iwoca.org/>

Using LISTSERVE and other e-mail lists, the IWOCA 2007 call for papers was distributed around the world, resulting in 42 contributed papers, of which 24 were accepted for publication in the Proceedings after review by two or (usually) three referees, making use of the EasyChair system. (Of these 24, only 20 were actually presented, and so became eligible for publication.) In addition eight invited speakers gave talks, and three problems sessions were held. The workshop was attended by 35 scientists from institutions in 16 territories: Australia, Canada, Chile, China, Cuba, Czech Republic, Greece, Indonesia, Israel, Japan, the Philippines, Poland, Russia, Spain, Taiwan, and the UK.

The invited talks, grouped by area, were as follows:

- Graph Algorithms

- (1) Brian Alspach, University of Newcastle, Australia: *Time-Constrained Graph Searching* — searching graphs or digraphs for an intruder under various assumptions.

- (2) Jan Kratochvíl, Charles University, Prague, Czech Republic: *Distance-Constrained Graph Labeling: from Frequency Assignment to Graph Homomorphisms* — solutions to the problem of assigning frequencies to transmitters so as to avoid interference.
  - (3) Takao Nishizeki, Tohoku University, Japan: *Orthogonal Drawings of Series-Parallel Graphs* — describes an efficient and effective algorithm for minimizing bends in plane embeddings of these graphs.
- Graph Decomposition
    - (4) Kristina Vušković, University of Leeds, UK: *The Use of Decomposition in the Study of Even-Hole Graphs* — a survey of recent applications of graph decomposition theory to the characterization of even-hole-free graphs.
  - String Algorithms (Algorithms on Words)
    - (5) Gadi Landau, University of Haifa, Israel: *Haplotype Inference Constrained by Plausible Haplotype Data* — a new constrained version of the haplotype inference problem was described that operates under both the perfect phylogeny and pure parsimony models.
    - (6) Moshe Lewenstein, Bar-Ilan University, Israel: *Full-Text Indexing in a Changing World* — viewed from a historical perspective going back 30 years, the need for fast, space-efficient full-text indices in many pattern-matching contexts is established, and new approaches proposed.
  - Other Combinatorial Areas
    - (7) Xuemin Lin, University of New South Wales, Australia: *Computing the  $k$  Most Representative Skyline Points* — a new, efficient and accurate algorithm for multi-criteria decision-making was proposed and evaluated.
    - (8) Brendan McKay, Australian National University: *The Volume of the Birkhoff Polytope* — the asymptotic volume as  $n \rightarrow \infty$  of the Birkhoff polytope (the polytope of all  $n \times n$  non-negative real matrices whose rows and columns each sum to 1) is determined (work with E. Rodney Canfield).

The contributed talks also ranged over a spectrum of topic areas, including in addition to graph theory and stringology the following: application of binary trees (in particular to the four colour theorem), compressed self-indexes, finite

automata, combinatorial optimization, computational complexity, spectral graph theory. The complete programme and the statements of the problems presented are available on the website:

<http://www.eng.newcastle.edu.au/~iwoca2007>

The Proceedings are published by College Publications:

<http://www.collegepublications.co.uk/>

It was springtime in Australia and Rafferty's Resort was home to a spectacularly colourful variety of birds and flowers. Participants enjoyed comfortable self-catering accommodation in cabins nestled among small groves of palm trees and eucalypts ("gums" as the Aussies call them). A half-day excursion visited vineyards and other attractions in the famous Hunter Valley wine country.

Next year's IWOCA will be held 13–15 September 2008 at the Nagoya Institute of Technology in Japan, cochaired by Koichi Wada of the Institute's Department of Computer Science & Engineering and Mirka Miller of The University of Newcastle, Australia.

