



Western Australian Centre of Excellence
in Industrial Optimisation



Report on the 18TH National ASOR Conference 2005 and 11th Australian Optimisation Day held at Curtin University of Technology, Perth, WA September 26-28 and 30, 2005.

These meetings were hosted and organised at Curtin University of Technology by the Western Australian Centre of Excellence in Industrial Optimisation (WACEIO). The National ASOR Conference is a biennial event and this was the second time it had been held in Perth; the previous conference was in 1990. The Australian Optimisation Day has become a very successful annual meeting. These meetings aim to provide a forum for optimisation researchers and operations research practitioners to exchange ideas and discuss their latest research applications. The theme of the Conference extends to both the practical and fundamental aspects of industrial optimisation. The meeting attracted over 90 registered participants. This year's meeting were a great success thanks to the participants. The Optimisation Day continued the great tradition of the previous ten meetings. The conference was sponsored by WACEIO, Curtin University's Division of Engineering, Science and Computing and ILOG. We are grateful for their support.

Over the four days we had 6 plenary speakers, 2 invited speakers and over 50 contributed papers which spanned all areas of optimisation: theory, method and applications. The papers are listed below. A full conference proceedings has been published.

The conference featured a number of invited sessions, the largest being the "Defence Operations Research" session strongly supported by the Defence Science and Technology Organization (DSTO). The Conference also featured the ILOG Optimization Technologies Workshop. Wei Ping Saw and Win Hong Mah from ILOG's Singapore office organized the workshop and presented the ILOG products. Professor Lou Caccetta presented a customer case study.

The Plenary Speakers were:

Shu-Cherng Fang, Industrial Engineering and Operations Research, North Carolina State University, Raleigh, North Carolina, USA. Title: Theory and applications of shape-preserving cubic L_1 splines.

Masao Fukushima, Department of Applied Mathematics and Physics, graduate School of Informatics, Kyoto University, Kyoto, Japan. Title: Expected residual minimisation: A new approach for stochastic linear complementarity problems.

George Nemhauser, School of Industrial and Systems Engineering, Georgia Institute of Technology, Atlanta, Georgia, USA. Title: Challenges in discrete optimisation.

David Ryan, University of Auckland, New Zealand. Title: Optimised production in an aluminium smelter.

Horst Hamacher, University of Kaiserslautern, Germany. Title: Multicriteria optimisation in radiation therapy.

Professor Kok Lay Teo, Department of Mathematics and Statistics, Curtin University of Technology, Perth, Western Australia. Title: A computational approach to the determination of optimal switching times and jumps for a class of impulsive systems.

The two invited speakers were:

Neville Curtis, Land Operations Division, DSTO, Perth, Western Australia. Title: Defence operationa research - puzzles, problems and messes.

Tom Vincent, Department of Aerospace and Mechanical Engineering, University of Arizona, Tucson, Arizona, USA. Title: Somatic evolution of cancer.

The contributed papers were:

Presenter	Contributed Paper
Adil Bagirov	Modified global k-means algorithm for clustering
Greg Day	A study of robust feedback filters for decision feedback equalisers
Giulia Wake	An exact mixed integer programming formulation for the modulation of intensity beams in cancer radiotherapy using multileaf collimators
Emily Duane	Improving order-picking efficiency through better warehouse design
Chris Fricke	Clique-based facets for the precedence constrained knapsack polyhedron
Ruth Luscombe	Identifying key infrastructure changes to improve rail network performance - Talk CANCELLED
Ranga Muhandiramge	Pre-processing and enumeration algorithms for solving weight constrained shortest path problem
Phil Howlett	An upper bound for the covariance when the marginals are known
Mark Grigoleit	A Lagrangian relaxation method for the submarine transit path problem
Damion Glassborow	Quantifying the effectiveness of intelligence, surveillance and reconnaissance in operations where manoeuvre warfare is conducted
Natashia Boland	A mathematical programming-based decision support tool for force allocation
Lifen Wu	Parametric transformations and multiplier form of fractional programming DEA models
Jesper Larsen	A hub location problem with fully interconnected backbone and access networks
Ismail Bin Mohd	Probabilistic algorithm for optimisation using Newton's method
Arvind Chandran	Complex simulation supporting OR for military decision making
John O'Neill	The studies guidance function
Renata Sotirov	New matrix representations and their applications
Justin Beck	Incompetence in non-zero sum games
Heng-Soon Gan	Modelling and optimisation of a bus service with multi-pickup-drop off locations
Ruhul Sarker	Simultaneous optimisation of multi-objective linear and nonlinear problems
Alex Ryan	Impact of correlations in logistics supply chains
Jan Pincombe	Developing robust strategies for rural midwifery, using scenario analysis
Hamish Waterer	Solving the classroom assignment problem using integer programming
Erhan Kozan	Robust reactive scheduling model as applied to a public hospital ICU
Marcus Brazil	The gradient-constrained Fermat-Weber problem for underground mine design
Guy Eitzen	Optimal product mix for Murray Goulburn cooperative
Vicky Mak	An iterative aggregation and disaggregation algorithm in unconstrained shape matrix optimisation
Musa Mammadov	An optimisation approach to the study of drug-drug interactions
Philip Neame	Minimum norm dual solutions and column generation stabilization
Alex Rubinov	Necessary and sufficient conditions for unconstrained global minimum
Sven Nordholm	On the use of scalarisation & efficient frontier in microphone arrays
Hai Huyen Dam	Online steerable far-field circular array

YH Leung	An optimisation approach to the derivation of Durbin's MA spectrum estimation method
Yanquin Liu	A primal-dual method for a class of convex semi-infinite programming problems
Necmi Avkiran	Stability and integrity tests in data envelopment analysis
Fred Bowden	Role of mission criticality in defining and evaluating system survivability
Andrew Coutts	Seminar war games as an objective evaluation tool
Layna Groen	Changes in product quality and consumer response
Rene Weiskercher	Scheduling meetings at trade events with complex preferences
Yakov Zinder	Scheduling UET tasks on parallel machines: Strength of priority algorithms
Mingren Shi	L1 Optimisation for robust signal processing

Presenter	Optimisation Day Paper
Ruhul Sarker	Relocating facility in an existing supply chain
Adil Bagirov	A derivative-free method for linearly constrained nonsmooth optimisation
Volker Rehbock	Optimal rest time for hybrid power systems
Musa Mammadov	H^∞ synthesis via a global optimisation approach
Jason Giri	The comparative efficiency of a modified penalty function approach to non-linear minimisation problems with a single constraint
Tom Mason	Short/medium term production forecasting using non-linear time series by Lipschitz approximation
Alex Rubinov	Global optimality conditions in non-convex quadratic minimisation under quadratic constraints
Wei-Rong Lee	Optimal design of FIR filters synthesised using the two-stage frequency response masking technique

A great event at the conference was the presentation of the Ren Potts Award to **Professor Jerzy Filar**. Professor Filar has made substantial contributions to the fields of Operations Research in particular in the areas of Game Theory, Markov Decision processing and Mathematical Programming. He has also been active in the promotion of the Operations Research discipline. Congratulations Jerzy. The prize was presented at the Conference Dinner.

We were fortunate in having a number of students presenting papers and the ASOR Prize Committee decided to award two student prizes – **Greg Day** (WATRI – UWA) and **Mark Grigoleit** (WACEIO – Curtin).

Congratulations to Greg and Mark on their achievement.

The Conference dinner was held at the Boatshed Restaurant, located in the picturesque banks of the Swan River. Guests were served a great meal and fine wines and enjoyed great views of Perth city which put on a fireworks display (not organized by us!).

I warmly thank all the participants for their participation and assistance.

Professor Lou Caccetta
Director, 18th ASOR