



# CIAO Newsletter

Centre for Informatics & Applied Optimization

School of Information Technology & Mathematical Sciences

Edition 9, June 2005

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Project members have developed several research instruments and honed procedures for further use.

Dr Pierce and Ms Sandra Herbert have contributed to the dissemination of details of research progress to date, through three referred publications and seven seminar presentations for researchers and practitioners.

They have also been involved in providing professional development for mathematics staff at partner schools around Ballarat, including Mt Clear College and Ballarat Secondary College.

In term two, data collection to assess change in students' algebraic expectations, understanding of key algebraic concepts and attitudes to technology is planned.



### CIAO Projects Website

The CIAO Projects Website is currently being updated, and will depict the following for each project:

- Commercial projects.
- Funded projects.
- Non-funded projects.
- Each Group will provide five to six projects, and each Cluster two to three projects.
- Some sub-projects & sub-sub-projects will be listed.

Duration of listed projects will be no less than three years, and may be significantly more.

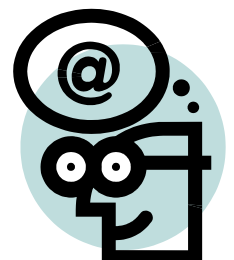
Project Leaders will be asked to provide a short summary of current core projects listing:

- ✓ Project Leader
- ✓ CIAO members
- ✓ Research associate/s and researchers (both internal and external) involved in the project
- ✓ Value of the project for commercial and funded projects
- ✓ Commencement date
- ✓ Proposed completion date

## News

### RiteMaths Project

Dr Robyn Pierce reports that good progress has been made in trialling a range of innovative teaching strategies, which use new technologies and involve real world contexts.



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web: [www.ballarat.edu.au/ard/itms](http://www.ballarat.edu.au/ard/itms)

### The Optimization Research Bridge (ORB)

Professor Alex Rubinov recently completed a three-year term as Chairman of The Optimization Research Bridge, the electronic newsletter of the Pacific Optimization Research Activity Group.

During this period CIAO hosted the ORB website, under the expert management of Graeme Cowling – thank you Graeme.

### The Pacific Optimization Research Activity Group (POP)

Professor Alex Rubinov has been appointed Working Committee Chairman of The Pacific Optimization Research Activity Group (POP).

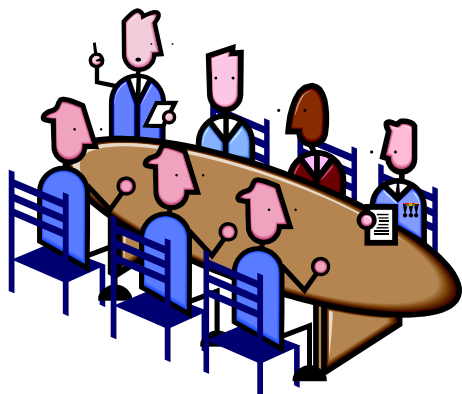
POP was established in October 2000, during the First Sino-Japan Optimization Meeting (SJOM 2000) in Hong Kong.

The sole aim of POP is to promote optimization research activities in the Pacific Region.

The acronym POP is taken the first letter of the first word "Pacific", and the first two letters of the second word "Optimization".

POP has no membership fees. All those who are interested in further promoting optimization research activities in this region are welcome to join the Group. It is not necessary to live in the Pacific Region.

POP now comprises more than 500 members from about 50 countries. There are two journals (Pacific Journal of Optimization and Journal of Industrial and Management Optimization) and two regular conference series (ICOTA and SJOM) associated with POP. POP's electronic newsletter – Optimization Research Bridge (ORB) – is issued regularly.



## CIAO Reports

### Collaborative Centre for e-Health (CCeH)

#### General Practice Computing Group

CCeH has been successful in winning a \$65,000 tender with the General Practice Computing Group (GPCG).

This project will undertake the development of a decoupled universal and open software component that can be used by any application to compile and de-compile compliant HL7 messages against approved HL7 use-profiles.

This software component will be 'rules engine-based' and designed such that it may be incorporated into any clinical applications, messaging applications or interface engines and encourage compliant HL7 message creation and usage.

The software component must be developed as a platform-independent re-usable component that will be made available in the open source domain.

#### Pharmacy Guild of Australia

CCeH has won a \$150,000 tender with the Pharmacy Guild of Australia for the dispensing and monitoring of Schedule 4 and Schedule 8 drugs with dependency properties. This project is currently under way, with CCeH working with Dr Jack Harvey. The project is expected to be completed in April 2006.



#### DH4 Pty Ltd

CCeH has been working for DH4 Pty Ltd in the development of the Healthconnect Message Architecture. This work commenced in February 2005 and was completed at the beginning of June 2005.

#### Service Co-ordination Tools Template

CCeH has also been working on the development of the Service Co-ordination Tools Template (SCTT) specification, with completion due at the end of June 2005.

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### **Combinatorics, Graphs and Networks Technology (CGANT)**



#### **Research Group Meeting**

The first meeting of the CGANT Research Group for the year 2005 was held on Friday 18 March 2005 at the Caro Convention Centre, University of Ballarat.

CIAO staff and students who attended the meeting were Professor Mirka Miller, Dr Ewan Barker, Dr Liping Ma, Dr Chris Turville, Dr Joe Ryan, Dr Prabhu Manyem, Ms Zari Dzalilov, Ms Kiki Sugeng, Mr Wei Xie, and Mrs Deval Patel.

Research collaborators from outside Ballarat who attended were Dr Ljiljana Brankovic (University of Newcastle) and Dr Christopher Lenard (LaTrobe University, Bendigo).

Presentations at the meeting were given by Professor Mirka Miller (Summable Graph Labeling), Dr Joe Ryan (Exclusive Sum Graph Labeling), Dr Christopher Lenard (Tutte's Flow Conjectures), Dr Prabhu Manyem (Logical Definability of NP Optimisation Problems), Dr Ljiljana Brankovic (On the Graceful Tree Conjecture), and Kiki Sugeng (Antimagic Graph Labelling).

The second meeting was subsequently held on Friday 27 May 2005. Speakers included Professor Peter Eades (University of Sydney and NICTA) who gave a presentation about Graph Drawing, and Dr Ian Roberts from Charles Darwin University.

#### **AWOCA 2005**

Preparations for the sixteenth Australasian Workshop on Combinatorial Algorithms (AWOCA 2005) to be held in Ballarat are in full swing.

The first call for papers was distributed widely over the Internet in the first week of March 2005. The submission deadline was 15 June 2005. Expressions of interest in participation have been received from participants from several countries.

The AWOCA website can be found at:

<http://www.ballarat.edu.au/conferences/awoca2005>

#### **Visit to Taiwan**

Dr Prabhu Manyem visited Taiwan from 25 March to 9 April 2005.

While there he collaborated with Professor Ruey-Lin Sheu, Professor in Mathematics, National Cheng-Kung University, Tainan, on two research topics: Manufacturing Networks,

and Bin Packing and Covering. Prabhu's visit was fully funded by a grant from the Australian Academy of Science.

As a result of this research, a paper on Variable Size Bin Packing will be submitted soon.

#### **New Secretary to Professor Mirka Miller**

We welcome Mrs Gaylene Gravestocks, in her new role as half-time secretary to Professor Miller. Gaylene previously worked in Staff Services at UB's Mt Helen Campus.

#### **On a Personal Note**

We are glad that Tian Hua, wife of our Masters student Mr Wei Xie, has arrived in Ballarat from Beijing. We warmly welcome her and hope she enjoys her life in Ballarat.

We mention with sadness that the father of Ms Kiki Sugeng passed away recently in Indonesia. Our condolences go to Kiki and her family.

#### **Data Mining & Informatics Research Group (DMIRG)**

Associate Professor John Yearwood will travel to Leipzig, Germany in July to attend MLDM 2005, the Fourth International Conference on Machine Learning and Data Mining Pattern Recognition.

John will present two papers, co-authored with Dr Adil Bagirov, Dr Rana Ghosh and Ms Moumita Ghosh, and will report on the conference in a later edition of this newsletter.



#### **Distributed Simulation Laboratory (DSL)**

Stay tuned for a report in the next edition of this newsletter.



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## Mathematical & Statistical Analysis Research Group (MASARG)

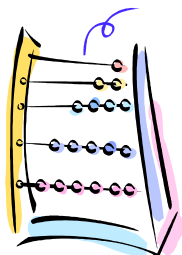
Here are some recent activities of MASARG members:

Dr Robyn Pierce is a member of the organizing committee for the 28th Annual Conference of the Mathematics Education Research Group of Australasia, which will be held in Melbourne in July 2005.

Dr Pierce is currently reviewing the submissions for Roundtables and Short Communications at this conference.

Dr Pierce and Ms Sandra Herbert will present a paper entitled: Potential of technology and a familiar context to enhance students' concept of rate of change at the same conference.

Professor Sid Morris will travel to Germany during July, to work with Dr Karl Hofmann on the pro-Lie groups book they have co-authored. This research and writing project has occupied Sid and Karl for the past six years.



## Emerging Communication Technologies (ECT) Cluster

### Visitor to ECT

The ECT Cluster was pleased to welcome Dr Wing Keung Tam (Research Fellow) to Ballarat in February 2005.

Dr Tam is based in Hong Kong, and spent a week with the ECT Research Cluster at UB, working with them on Bluetooth Electric Meter Reading and Health Care projects.

Dr Tam also presented a seminar to ITMS staff and research students on "Bluetooth Application for a Secure Electric Power Meter Reading".

### Recent activities

Mr Keyur Patel was a Scientific Committee Member for IADIS Virtual Multi Conference on Computer Science and Information Systems: MCCSIS 2005, 11-29 April 2005, and Virtually Located.

Mr Keyur Patel also participated as Program Committee Member for IADIS, the International Conference on Applied

Computing 2005 (AC 2005), 22-25 February 2005, Algarve, Portugal.

### Upcoming activities

Mr Keyur Patel and Dr Wing K Tam are Program Committee Members for the First International Conference on Energy, Information and Cybernetics: EIC 2005, 10-13 July 2005 in Orlando, Florida.

Mr Keyur Patel is also Program and Committee Member for:

- The 3<sup>rd</sup> International Conference on Education and Information Systems: Technologies and Applications: EISTA'05, 14-17 July 2005, Orlando, Florida, USA.
- The 3<sup>rd</sup> International Conference on Politics and Information Systems: Technologies and Applications: PISTA'05, 14-17 July 2005, Orlando, Florida, USA.
- International Symposium on Free/Open Source Software, Technologies and Content: FOSSTEC'05, 10-13 July 2005, Orlando, Florida, USA.
- The 9<sup>th</sup> World Multi-Conference on Systemics, Cybernetics and Informatics: WMSCI 2005, 10-13 July 2005, Orlando, Florida, USA.



## Intelligent Finance Cluster (IFC)

The Intelligent Finance Cluster held a progress meeting on Friday 27 May 2005. The Program of the meeting included:

1. Progress on Multifractal Trend Analysis by Dr Heping Pan.
2. New Ideas on Stock Index Prediction and Trading Strategies by Dr Heping Pan.
3. Progress on Multivariate Statistical Analysis for Portfolio Management by Mr Cameron Hurst and Mr Timothy Walsh.
4. Progress on Intermarket Influence Analysis by Ms Chandima Tilakaratne.

This was an inner circle meeting, so focus was directed to key ideas and technicalities.

Dr Pan reported that he recently read a paper recommended by Associate Professor John Yearwood, on comparing neural network structures for stock index prediction.

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The conclusion from the paper is that the mixture of experts (MoE) is by far the best approach, and superior to global models using multilayer perceptrons and recurrent neural networks. In fact, this conclusion is consistent with our experience using Probability Ensemble of Neural Networks (PENN).

The difference is that MoE requires data clustering before training expert models. In their case, the expert models are Radial Basis Functions or Support Vector Machines. The key to the success of Neural Networks for prediction is not so much on the neural network itself, but on the data clustering which would require multifractal trend analysis.



## Conferences & Seminars

### **International Conference on Control Problems and Applications, Minsk, Belarus, 16-21 May 2005**

Dr Alex Kruger and Professor Alex Rubinov attended this conference and each made presentations. Professor Rubinov also gave a plenary lecture.

Dr Kruger had useful discussions with colleagues at the Institute of Mathematics of the National Academy of Sciences of Belarus, mostly with Professor Valentin Gorokhovich. This will be the start of a joint research project.

### **Optimization and Control Conference, Moscow, Russia, 19-20 May 2005**

Dr Alex Kruger and Professor Alex Rubinov attended this conference and each made presentations.

### **The 1st International Conference on Control and Optimization with Industrial Applications, Baku, Azerbaijan, 22-25 May 2005**

CIAO actively participated in the organisation of this conference.

Professor Alex Rubinov was one of the four co-organisers, and a total of four CIAO members (Dr Adil Bagirov, Ms Zari Dzalilov, Dr Alex Kruger and Professor Alex Rubinov) attended this conference.

Dr Bagirov and Professor Rubinov presented plenary lectures, Ms Dzalilov presented two talks, and Dr Kruger presented one talk.

Among the participants at the Baku conference was Professor Hossein Mohebi from Iran, who had spent a year at CIAO in 2003/2004 as a visiting Professor.

ITMS attendees found these conferences interesting and professionally very useful, particularly for making new contacts.

### **Workshop on Mathematical Programming in Data Mining and Machine Learning, Hamilton, Canada, 1-4 June 2005**

Professor Alex Rubinov gave a plenary lecture on CIAO methods and achievements in data mining. The workshop was attended by some leading experts in this field.

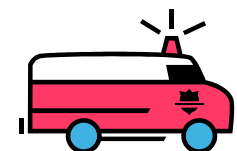


## Tenders / Consultancies

### **Rural Ambulance Victoria Consultancy**

Dr Heping Pan is part of the winning team which recently won a consultancy with Rural Ambulance Victoria.

The grant will research the topic "A GIS-based Predictive and Reactive Emergency Planning Solution", which will address the problem "What Determines Demands on Emergency and Non-Emergency Services in Regional Victoria".



### **Research Infrastructure Block Grant**

Congratulations to Dr Andrew Stranieri, Associate Professor John Yearwood, Dr Adil Bagirov, Dr Rana Ghosh and Dr Musa Mammadov on winning a UB Research Infrastructure Block Grant of \$20,000.

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### ADF – XMSFT

The University has been successful in winning a tender with Defence Science and Technology Organisation.

The project commenced in June 2005, and calls for development of a software product eXtensible Modelling and Simulation Framework Testbed (XMSFT), which will allow web service access to executing HLA simulations.

This contract is for the development of a software product that shall provide a configurable web service interface to an executing HLA federation.

CIAO personnel who have been instrumental in winning this project, and who will develop the software, are Dr David Stratton, Mr Tim Pokorny and Mr Michael Fraser.

### RCH – Cystic Fibrosis

In January 2005, researchers in CIAO commenced an analysis of the Cystic Fibrosis database maintained by the Royal Children's Hospital, Melbourne.

The project involves data mining the database, to determine a new scoring system for rating the severity of the condition in patients. Patient medical and statistical data, gathered over a period of years, is being analysed to identify key conditions critical to a patient's health. Genomic data is also being utilised.

This joint project is headed by the University of Ballarat, and involves the Cystic Fibrosis Foundation of Victoria, Victorian Partnership of Advanced Computing, Latrobe University, Deakin University and RMIT.



### DEWR – Occupational Disease

In late May 2005, CIAO was successful in gaining a project with the Office of the Australian Safety and Compensation Commission (OASCC), within the Federal Department of Employment and Workplace Relations.

The project will undertake analysis of the National Occupational Disease Database (listing workers compensation claims), to identify trends and areas of

clinical/occupational interest. The objective is to identify future trends in eight critical occupational disease areas.



### OTTE - TAFE Options

On the 22 June, 2005, a presentation of the newly developed TAFE Options system was shown to the Executive of the Office of Training and Tertiary Education.

The Executive expressed their appreciation for the project, which was delivered on time and within budget.

This system, jointly developed by CIAO, JustSys, Permian and i4Talent, aids prospective TAFE students, whether young or mature, in identifying their career objectives and possible study options.

For those already in the workforce and wanting a career change, the system will assess a person's current skill base, and identify possible skill gaps for prospective jobs sought.

CIAO is currently involved in identifying options whereby it can further enhance the technology developed, and deploy it to other interested organisations.

### New Commercial Activity

CIAO personnel are currently involved in discussions with numerous organisations in scoping proposed collaborative projects. These include:

- St John of God Hospital – Joint Replacement and evidence-based practice.
- FMP Bendix – Optimization of production processes.
- Transfield Services – Optimization projects.



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## ITMS Colloquia & Seminars

### ITMS Colloquia Series 2005

The 2005 Colloquia Series commenced in early February, and has attracted a diversity of speakers and professional expertise.

The colloquia are held at 4.30pm on Wednesdays, and are preceded by afternoon tea. It's a great opportunity for ITMS staff and post-graduate students to informally meet the speaker.

Visiting speakers to date have included:

Professor Subhra Dey, Monash University:  
Optimal resource allocation in wireless networks.

Professor Alistair Moffat, Monash University:  
Making connections: transition issues facing First Year computing students.

Professor Peter Taylor, University of Melbourne:  
Capacity Reconfiguration in Logically Fully-Connected Networks.

Professor Zbigniew Michalewicz:  
Adaptive Business Intelligence.

Professor Leon Sterling, Monash University:  
A Roadmap for Agent-Oriented Software Engineering.

Professor Geoff Webb, Monash University:  
Not so naive Bayesian classification.

Professor James Harland, RMIT University:  
Intelligent Systems Research at RMIT University.

Professor Brian Garner, Deakin University:  
Heuristic processes in predictive modelling.

Professor Yun Yang, Swinburne University:  
SwinDew – A P2P-based Decentralised Workflow Management System.

Professor David Green, Monash University:  
Oh, What a Tangled Web We Weave...

Professor Mark Wallace, Monash University:  
Painless Problem Decomposition.

Professor Graham Farr, Monash University:  
Recent results on Tutte-Whitney polynomials.

Professor Peter Eades, National ICT Australia (NICTA):  
Visualization of Networks.

### ITMS Seminar Series 2005

We also run a 2005 Seminar Series, and these seminars are predominantly held at 1pm on Thursdays.

Speakers to date have included:

Dr Wing K Tam, Group Sense PDA Limited, Hong Kong:  
Bluetooth Application for a Secure Electric Power Meter Reading.

Ms Sally Firmin, ITMS Staff Member & Honours Student:  
The learning value of e-communication tools – a student perspective.

Professor Paul Gruba, University of Melbourne:  
Writing a better thesis.

Mr John Avery, ITMS PhD Student:  
Ramifications of change in a distributed ontology system.

Mr David Lemphers, Microsoft Australia:  
Whidbey, Yukon, Longhorn: Stopping all stations.

Dr Aleksandar Stojmirovic, recent PhD graduate of Victoria University, Wellington, New Zealand:  
Geometric Aspects of Similarity Search of Biological Sequence Datasets.



## Publications

### Accepted Books, Chapters & Papers

S Morris & K Hofmann, Book on Pro-Lie Groups, to be produced by the publishing arm of the European Mathematical Society.

A.M. Bagirov and J. Ugon, Supervised Data Classification via max-min separability, in Applied Optimization: Continuous Optimization: Current Trends and Modern Applications, A.M. Rubinov & V. Jeyakumar (eds), Springer.

A.M. Bagirov and J. Ugon, Piecewise partially separable functions and a derivative-free method for large-scale nonsmooth optimization, in Journal of Global Optimization.

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A. Rubinov, N. Soukhoroukova and J. Ugon, Clusters and classes in data analysis, to appear in European Journal of Operations Research.

R. Baratov and A. Rubinov, Conical decomposition and vector lattices with respect to several preorders, to appear in Taiwanese Journal of Mathematics.

S Ivkovic, R Ghosh and J Yearwood, Visual Grouping of Association Rules by Clustering Conditional Probabilities for Categorical Data: Computational Intelligence for Organization Managers, Chapter 13, Business Applications and Computational Intelligence, Kevin E. Voges and Nigel K. Li. Pope, eds.

F Afshar, J Yearwood and A Stranieri, A Tool for Assisting Group Decision Making for Consensus Outcomes in Organizations, Chapter 16, Business Applications and Computational Intelligence, Kevin E. Voges and Nigel K. Li. Pope, eds.

K Patel, Successful Implementation of Emerging Communication Technologies in a Mobile-Intense Organization: A Case Study of Sydney Airport Corporation Limited (SACL), Handbook of Research in Mobile Business: Technical, Methodological and Social Perspective, IDEA Group Publishing (IGP), Hershey, PA, USA (To appear as a book chapter).

M Mammadov and R Orsi, H-infinity via a Nonsmooth, Nonconvex Optimization Approach, to appear in Pacific Journal of Optimization, Vol. 1, No.2, 405-420.

Mohebi and A.M. Rubinov, Best approximation by downward sets with applications, in Analysis in Theory & Applications.

## Published Books, Chapters & Papers

A.M. Bagirov and A.M. Rubinov, On minimization of max-min functions, in Applied Optimization, Vol. 96: Optimization and control with applications, L. Qi, K.L. Teo and X.Q. Yang (eds.), Springer, 2005, pp. 3-33.

A.M. Bagirov, L. Churilov, D. Schwartz, K. Smith & M.Dally, Data mining with combined use of Optimization Techniques and Self-Organizing Maps for Improving Risk Grouping Rules, Journal of Management Information Systems, Vol.21, No.4, 2005, pp. 85-100.

A.M Rubinov and A.P. Shveidel, On some class of abstract convex functions, in Optimization and Control with Applications, L.Q. Qi, K.L. Teo and X.Q. Yang, eds, Springer, NY, pp 141-153, 2005.

A Rubinov, Z.Y. Wu and D. Li, Hidden Abstract Convex Functions, Journal of Nonlinear and Convex Analysis, Vol. 6, pp 203-216, 2005.

M. Baca, E.T. Baskoro and M. Miller "Antimagic Valuations for the Special Class of Plane Graphs", Combinatorial Geometry and Graph Theory, Lecture Notes in Computer Science 3350, Revised Selected Papers from IJCCGGT2003 (eds. Akiyama, Baskoro & Kano), pp.58-64.

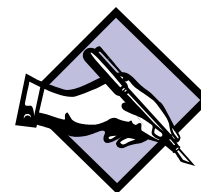
Y. Lin, M. Miller and C. Rodger "All (k;g)-Cages are k-Edge Connected, Journal of Graph Theory, Vol.48, pp.219-227, 2005.

A.M.Rubinov, Sigma-porosity in monotonic analysis with application to optimization, in Abstract and Applied Analysis, No.3 (2005), pp.287-306.

J.E.Martinez Legaz, A.M. Rubinov and S. Schaible, Increasing quasiconcave co-radiant functions with applications in mathematical economics, in Mathematical Methods in Operation Research, vol. 61, pp.261-280, 2005.

M. A. Lopez, A. M Rubinov, V. N. Vera de Serio, Stability of semi-infinite inequality systems involving min-type functions, in Numerical Functional Analysis and Optimization, Vol.26, pp.81-112, 2005.

M. A. Lopez, A. M Rubinov, V. N. Vera de Serio, Stability of the lower level sets of ICAR functions, in Numerical Functional Analysis and Optimization, Vol.26, pp.113-127, 2005.



## Conference Papers

Dr Robyn Pierce has recently had a refereed paper accepted for the 29th Annual Conference of the International Group for the Psychology of Mathematics Education to be held in Melbourne in July 2005. It is titled "Linear functions and A triple influence of teaching on the development of students' Algebraic Expectation".

Ms Sandra Herbert's proposal for a short oral presentation titled "An Emergent Model for Rate of Change" has also been accepted at this conference.

K Patel and W K Tam, A Secure Electric Meter Readings Application Using Bluetooth, The IASTED International Conference on Networks and Communication Systems: NCS 2005, April 18-20, 2005, Krabi, Thailand.



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D Patel, M Miller, K J Patel, On Network Securities and Internet Vulnerabilities, in N. Guimarães and P. Isaias (editors) proceedings of IADIS International Conference on Applied Computing 2005, vol. 2, pp. 275-282, Feb 22-25 2005, Algarve – Portugal.

G. Skinner, E. Chang, M. McMahon, J. Aisbett and M. Miller "Shield Privacy Hippocratic Security Method for Virtual Community", 30th Annual Conference of the IEEE Industrial Electronics Society, 2004, Busan, Korea, 8pp.

A. Ahmad and M. Miller "Security Issues in Statistical Databases and Implementation of Audit Expert", Proceedings of ICCS 2004, Romania, pp.53-58.

Y. Lin, A. Ahmad, M. Miller, K. Sugeng and M. Baca "Further Results on d-antimagic Labelings of Antiprisms", Proceedings of AWOCA 2004, Balina, pp.103-108.

E.T. Baskoro, Y.M. Cholily and M. Miller "On the Structure of (d,3)-digraphs containing Selfrepeats", Proceedings of AWOCA 2004, Balina, pp.199-205.

J.A. MacDougall, M. Miller and K. Sugeng "Super Vertex-magic Total Labeling of Graphs", Proceedings of AWOCA2004, Balina, pp.222-229.

R. Simanjuntak and M. Miller "Maximum Order of Planar Digraphs", Combinatorial Geometry and Graph Theory, Lecture Notes in Computer Science 3350, Revised Selected Papers from IJCCGGT2003 (eds. Akiyama, Baskoro and Kano), pp.159-168.

K. Sugeng, M. Miller, Slamir, M. Baca "(a,d)-Edge Antimagic Total Labelings of Caterpillars", Combinatorial Geometry and Graph Theory, Lecture Notes in Computer Science 3350, Revised Selected Papers from IJCCGGT2003 (eds. Akiyama, Baskoro and Kano), pp.169-180.

M. Tuga & M. Miller "Delta-Optimum Exclusive Sum Labeling of Certain Graphs with Radius One", Combinatorial Geometry & Graph Theory, Lecture Notes in Computer Science 3350, Revised Selected Papers from IJCCGGT2003 (eds. Akiyama, Baskoro, Kano), pp.216-226.

### Special Issue: Journal of Global Optimization

A Special issue of the International *Journal of Global Optimization* dedicated to 65<sup>th</sup> birthday of Professor Alex Rubinov is currently in preparation.

Guest editors for this issue are Professor Xiaoqi Yang (Polytechnic University, Hong Kong) and Professor Duan Li (Chinese University, Hong Kong). Some leading experts in optimization and related topics have submitted their papers to this special issue.

## Post-Graduate News

### Confirmation of Candidature

Ms Chandima Tilakaratne has successfully completed her PhD Confirmation before a panel, which consisted of experts from the University of Ballarat and CSIRO.

We extend our thanks to Professor Sid Morris, Dr Heping Pan, Professor Mirka Miller, Associate Professor John Yearwood, Associate Professor Trevor Hastings, Associate Professor Stephen Hall, Mr Cameron Hurst and Dr Zili Zhu (CSIRO) for their participation on the Panel.

Chandima's PhD research focuses on intermarket influence analysis using statistical models and test procedures.

Her methodology breaks the intermarket influence analysis into four aspects: intermarket influence on price returns, on volatilities, on trends and on multifractalities.

The detected influences will then form a dynamical Bayesian network. Nonlinear models such as Probability Ensemble of Neural Networks will then be trained to make predictions on any selected target market given its own time series, and the time series of its influencing markets.

### May 2005 Graduands

Congratulations to the following ITMS students who graduated in May 2005:

- Ms Faezeh Afshar (MIT)
- Ms Michelle O'Brien (PhD)
- Mr Long Jia (PhD)
- Mr Jiapu Zhang (PhD)



### PG Seminar Series 2005

Ms Shahnaz Kouhbor is an ITMS PhD student, who has generously made herself available to co-ordinate this Seminar Series during 2005.

The seminars take place at the Global Innovation Centre at Mt Helen Campus, where ITMS Post-Graduate students are based. All ITMS staff and PG students are invited to attend.

# CIAO Newsletter

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Speakers to date have included:

Dr Rana Ghosh, Dr Michelle O'Brien and Dr Nadejda Soukhoroukova, ITMS:  
Important issues to consider when writing a thesis.

Professor Sid Morris and Dr Andrew Stranieri, ITMS:  
What examiners are looking for when reading a thesis.

Mr Dafik, ITMS PhD student:  
Improving Upper and Lower Bounds on the Order of Large Digraphs under Degree and Distance Constraint

Mr Wei Xie, ITMS PhD student:  
Clustering in Networks

## Papers Submitted / Conferences Attended

Ms Shahnaz Kouhbor's paper titled "Optimal placement of access points in WLAN base on a new algorithm" for the IEEE/ICMB 2005 has been accepted. This conference, the Fourth International Conference on Mobile Business, will be held from 11-13 July 2005 in Sydney.

Ms Kouhbor attended the IEEE/ICACT2005 (International Conference on Advanced Communication Technology) conference in Korea from 21-23 February 2005, to present a paper titled "A New Algorithm for the Placement of WLAN Access Points Based on Nonsmooth Optimization Technique".

240 papers from 63 different countries were submitted to this conference, and topics included Next Generation Network Technology, Advanced Intelligent Network, Wireless LAN, Mobile Communications, Broadband, Communication Planning, and Multimedia.

On 1-2 March 2005, Ms Kouhbor also attended the "Wireless Australia 2005" Conference in Sydney. Many international companies including Cisco, D-Link, iPass, Intel, Extreme, Motorola and Australian companies such as Telstra, NEC Australia and SkyWire Australia participated at the conference.

These companies presented seminars, case studies, and exhibited their products on Wireless LAN (802.11 a/b/g) and WiMax (802.16). Telstra reported that WLAN has been installed in the Melbourne CBD and most McDonalds outlets.

## Thesis Submission

Congratulations to Mr Simon Barty and Mr Julien Ugon, who recently submitted their PhD Theses for examination.

## Welcome to New Arrivals

We welcome the following new students to ITMS:

- ✓ Mr Shamsul Huda, PhD topic: Optimization approaches to text categorisation.
- ✓ Mr JianMin ("Jimmy") Tang, PhD topic: Modelling dynamic interconnection network.
- ✓ Ms Thi Minh Thu Vuong, MMS topic: Complemented and uncomplemented subspaces of banach spaces and banach algebras.
- ✓ Mr Guillermo Pineda-Villavicencio, PhD topic: Improving upper and lower bounds on the order of large graphs under degree and distance constraints.



## Congratulations to Tim Pokorny

Congratulations to Tim Pokorny for **again** winning the prize for the Best Student Paper at this year's SimTecT Conference, with his paper entitled "The Model Driven Architecture: No Easy Answers".

SimTecT 2005 was held at the Sydney Convention and Exhibition Centre from 9-12 May 2005.

The theme of this year's conference was "Simulation – Fulfilling the Promise: Successes and Visions for the Road Ahead".



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### Visitors to CIAO

#### **Dr Iradj Ouveysi, Telstra Research Laboratories**

Dr Ouveysi visited CIAO from 3-5 April 2005. The goal of his visit was to discuss a joint research project with Zari Dzalilov. Dr Ouveysi was Zari's Associate Supervisor during her PhD research.

#### **Dr Yalcin Kaya and Dr Regina Burachik, University of South Australia**

Dr Kaya and Dr Burachik visited CIAO from 6-10 April 2005. Dr Burachik has a joint project with Professor Alex Rubinov, and Dr Kaya discussed possible joint research with Dr Adil Bagirov and Dr Musa Mammadov.

#### **Dr Zhiyou Wu, University of NSW**

Dr Wu visited CIAO from 12-15 April 2005. Dr Wu is working with Professor Alex Rubinov and Associate Professor V. Jeyakumar from UNSW on the project *Necessary and sufficient conditions in multi-extremal continuous optimization*, supported by an ARC Discovery Grant.

#### **Dr Ljiljana Brankovic**

Dr Brankovic of the University of Newcastle (NSW) visited Professor Mirka Miller and the CGANT group from 18-21 March 2005.



### Research Reports

- 05/01 An Optimization Approach to the study of drug-reaction relationships on the basis of ADRAC dataset: Neurological class of reactions, Dr Musa Mammadov, Mr Evan Dekker and Mr Gary Saunders, February 2005.
- 05/02 Decomposability of Polytopes, Krzysztof Przeslawski and Dr David Yost, February 2005.
- 05/03 About Regularity of Set Systems, Dr Alexander Kruger, May 2005.



All ITMS staff members and postgraduate students are encouraged to contribute to the next edition of the CIAO Newsletter

Examples of newsletter items are: projects in progress, papers accepted, research in process, publications, grants, seminars, visitors to ITMS, visits, scholarships, reports from school research groups / centres, events, conferences, new discoveries, and general items of interest

All items should be sent to Elizabeth Matuschka ([e.matuschka@staff.ballarat.edu.au](mailto:e.matuschka@staff.ballarat.edu.au)) by Friday 26 August 2005