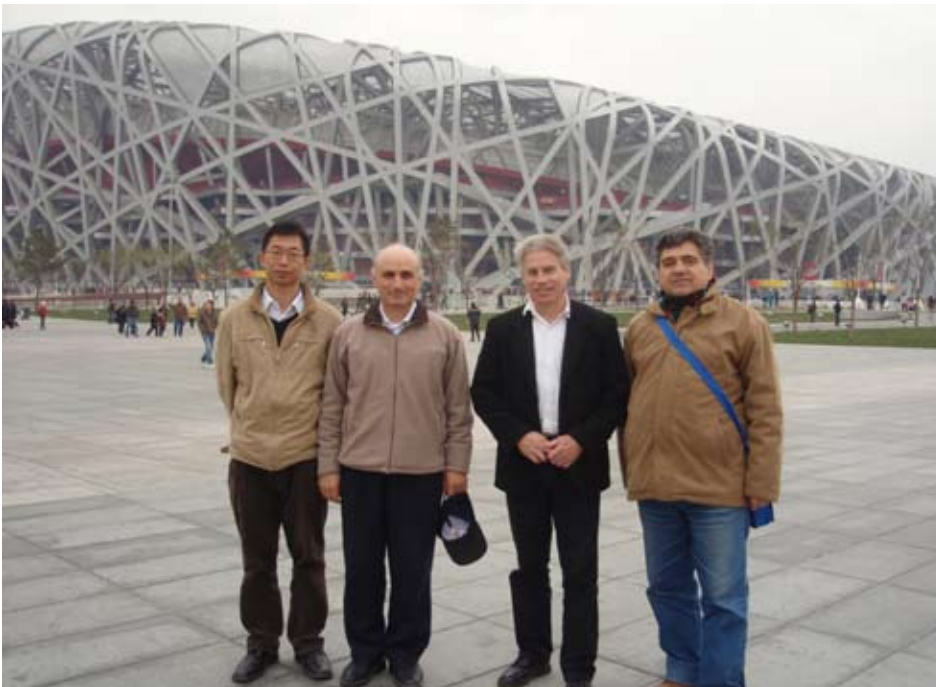


CIAO Newsletter

Centre for Informatics & Applied Optimization
Graduate School of Information Technology & Mathematical Sciences, University of Ballarat





Above (L to R): Professor John Yearwood, CIAO Director and Dr Andrew Stranieri, CIAO Deputy Director

[Main picture (L to R): Dr Fusheng Bai, Dr Adil Bagirov, Professor John Yearwood and Dr Musa Mammadov in Beijing, China]

Stronger ties with China

CIAO Director Professor John Yearwood has recently returned from a two-week visit to China, with Dr Fusheng Bai, Dr Adil Bagirov and Dr Musa Mammadov. The purpose of the trip was to **strengthen existing links and establish new ones.**

Chongqing: The first week of the trip was funded by **Chongqing Normal University (CNU)**, under a Chinese Government scheme for supporting research collaboration.

CIAO research papers were presented to the staff and students of the **Mathematics Department at CNU**, and Professor Yearwood also presented a talk titled "Some optimization-based algorithms for the classification of DNA sequences". These presentations prompted many questions on the data mining and optimization work CIAO undertakes.

Professor Yearwood subsequently gave a presentation on Australian culture to the **School of Foreign Studies**, at the new CNU campus, and met with 9 CNU mathematics students who are interested in doctoral study in our Graduate School.

Beijing: In Beijing, discussions took place with **Associate Professor Liu** from the **Research Centre for Future Internet Technology, Tsinghua University**. In particular, there are potential areas for collaboration with CIAO's Internet

Commerce Security Laboratory (ICSL), in areas such as the security vulnerabilities of Internet Protocol Version 6.

Professor Yearwood also gave a presentation about **CIAO's work on data mining phishing data**, which led to further discussion about collaboration opportunities.

This was followed by a meeting with **Professor Lieu** from **Beihang University**, a visit to their laboratories and a discussion about their security devices. Agreement was reached to jointly submit an **Australia-China Grant Application in 2010**, which will apply optimization techniques to the work they do.

A formal discussion with the **Vice-Dean** looked at possibilities for their students in the ITMS Graduate School.

Harbin: At **Harbin Engineering University (HEU)** Professor Yearwood and Dr Mammadov Musa made presentations to the staff & about 40 Masters students.

Later there was a very successful formal meeting with the **Vice-President of HEU and the Vice-Dean of their Foreign Affairs Department**, and they are keen to strengthen their collaboration with CIAO.

Interviews were also conducted with 6 potential PhD students for our Graduate School.

Shanghai: In Shanghai, Prof Yearwood, Dr Mammadov and Dr Bai presented talks to students and staff of the **Mathematics Department at Shanghai University**, and subsequently met with 8 potential PhD students for our Graduate School. Dr Bai's talk was titled "Filled function methods for solving systems of non-linear equations" and Dr Mammadov's talk was titled "Statistical convergence & asymptotical stability of optimal trajectories".

There was a formal signing of the renewal of the **China-Australia Collaboration in Applied Optimization (CACAO) Memorandum of Understanding with Shanghai University**. During these meetings CIAO also agreed to host the next **China-Australia Workshop in Ballarat**, scheduled for **December 2009**.

Next stop was a visit to **Tongji University (TU)** for discussions with personnel in their **Civil Engineering School**. TU have a large group of researchers whose work focuses on water, and agreement was reached to collaborate with CIAO, with particular focus on the development of new optimization models for water and drainage problems.

This was followed by a visit to **Fudan University**, at the invitation of **Professor Xiaolin Sun** in the **School of Management**, which houses their Operations Research and Statistics staff. Dr Bagirov gave a talk titled "Quasidifferentiable optimization: methods & applications", and it was a great opportunity to see Professor Sun again, as he is a good friend of CIAO.

Fudan University also expressed a keen interest in hosting the **China-Australia Workshop in 2011**. This concluded a hectic but rewarding fortnight in China.

Dr Zhiyou Wu

Staff Member Profile

Dr Zhiyou Wu is a Research Fellow in the Graduate School of Information Technology & Mathematical Sciences.

She is a member of CIAO's Mathematical Analysis and Optimization Research Group, & has already developed a significant publication record.

Dr Wu holds three degrees, which were awarded while in China:

> a Bachelor of Science from Chongqing Normal University.

> a Master of Science and a PhD (Operations Research) from Shanghai University.

Operations Research utilises advanced mathematical modelling methods to analyse complex situations, to provide a rational basis for decision making.

It is used to understand and predict system behaviour and improve system performance.

Operations Research originated just prior to World War II, as the British prepared for the anticipated air war.

Exploratory experiments were undertaken to explore how information - provided by the then new phenomenon of radar - could be used to direct deployment and the use of fighter planes.

Dr Wu's special research interests are optimization, convexity and its generalisations, nonsmooth analysis, global optimization and algorithms, penalty function, global optimal conditions, location problems, and system of nonlinear equations.

In 2006 Dr Wu won an **Australian**



Research Council Discovery Grant to research the topic "Filled Function Methods for Global Optimization and their Applications".

This is a three-year grant providing research funding of \$231,000.

Global optimization is the task of finding the best set of parameters to optimize an objective function.

It is a branch of mathematics which involves a high degree of complexity and sophistication, especially when compared with local optimization.

Global optimization problems are typically very difficult to solve, and necessitate the development of complex algorithms.

In 2007 Dr Wu won an **International Humboldt Fellowship** from the Alexander von Humboldt Foundation in Bonn, Germany.

The Foundation provides the opportunity for highly qualified early career researchers who hold a PhD to visit Germany for 6-12 months, to carry out research projects

of their choice and learn the German language.

The Fellowships are offered on an internationally competitive basis, and successful applicants are chosen for their international publication profile, and the quality and feasibility of their research project.

Dr Wu was awarded **two honorary positions** in June 2007 with her former university, Chongqing Normal University, in China: Honorary Professor & Honorary Head, School of Mathematics & Computer Science.

Prior to joining the University of Ballarat in 2005, Dr Wu worked as a Research Associate at the University of New South Wales in Sydney, and a Research Fellow at Nanyang Technological University in Singapore.

This was preceded by employment as a Postdoctoral Fellow in the Department of Systems Engineering & Engineering Management, at the Chinese University of Hong Kong.

From 1990 to 2005 Dr Wu worked in the School of Mathematics and Computer Science at Chongqing Normal University, in China. She commenced as a Lecturer, later becoming an Associate Professor, before being promoted to Professorial status.

She has lectured in calculus, functional analysis, operations research, convex analysis and nonlinear programming.

Dr Wu currently lives in Ballarat with her mathematician husband, Dr Fusheng Bai, and their son.

Barcelona Visitor

Professor Juan Enrique Martinez-Legaz

Professor Martinez-Legaz visited CIAO for several weeks in January-February 2009, to undertake research collaboration with Dr Adil Bagirov.

He is a Professor of Economics at the Universitat Autònoma de Barcelona, Barcelona, Spain, and an expert in the

areas of optimization, nonlinear analysis and their applications in economics.

Professor Martinez-Legaz is Editor-in-Chief of the journal Optimization, and an Editorial Board Member of several other international journals. He also co-wrote a number of research papers with the late Professor Alex Rubinov, Founding Director of CIAO.

This was his sixth visit to UB, and on this occasion was accompanied by his son.



Research Group News

MAORG: Mathematical Analysis & Optimization

Leader: Dr Adil Bagirov



The **Water Pipeline Optimization Project** with Grampians Wimmera Mallee Water (GWM Water) and being led by Dr Adil Bagirov is progressing well.

An elegant optimal solution and supporting software have been developed & were recently demonstrated to our client, with the final version to be finalised by the end of March 2009.

Professor **Sidney Morris** recently travelled to Europe, to undertake collaborative research with long time colleague Professor Karl Heinrich Hofmann of the Technical University of Darmstadt, Israel.

He also visited the following institutions while in Israel:

> **Ben Gurion University of the Negev**, to collaborate with Dr Arkady Leiderman and present a colloquium titled "The structure of abelian pro-Lie groups".

> **Technion - Israel Institute of Technology, Haifa**, to discuss collaboration with Professor Michael Cwikel and present a colloquium titled "An introduction to pro-Lie groups - a wide and well-behaved class of topological groups".

> **Hebrew University, Jerusalem**, to present a seminar on pro-Lie groups.

Dr **Alex Kruger** attended the International Symposium on Variational Analysis and Optimization - dedicated to the 60th birthday of Professor Boris Mordukhovich - at Sun Yat-Sen University, Kaohsiung, Taiwan, in late November 2008.

On his way home, he also visited the National University of Singapore, Singapore.

DMIRG: Data Mining and Informatics

Leader: Dr Peter Vamplew (below)
Deputy Leader: Dr Richard Dazeley



DMIRG members met on 10 February 2009 for a **strategic planning** meeting.

Current **key projects** for DMIRG include:

> A pilot research consultancy on landslip data for the **Victorian Department of Primary Industries**.

> An investigation into a possible **text mining consultancy**.

> A consultancy for the **Victorian Department of Justice** on decision modelling for working with children.

> Reasoning communities work with the **Water in Drylands Collaborative Research Program (WIDCORP)**.



Dr **Peter Vamplew** and Dr **Richard Dazeley** attended and presented research papers at the 21st Australasian Joint Conference on Artificial Intelligence in Auckland, New Zealand, in December 2008.

Dr **Andrew Stranieri** and Ms **Armita Zarnegar** attended and presented research papers at the Australasian Computer Science Week in Wellington, New Zealand in January 2009.



Recent Visitors to CIAO

Professor **Maxim Todorov**
University of Puebla, San Andres, Mexico

Professor Todorov visited CIAO for the second half of January 2009, as a guest of Dr Alex Kruger, to work on building research links with UB.

CIAO contact with Professor Todorov was originally made by the late Professor Alex Rubinov.

Professor Todorov's research interests are optimization (semi-infinite and vector), functional analysis and linear algebra, which he conducts through his membership of the Institute of Mathematics and Informatics at the Bulgarian Academy of Science.

During his visit, Professor Todorov (pictured below) presented a seminar on M-decomposable convex sets to academic research staff and students.



He also lectures in mathematical analysis and differential equations at the University of Puebla.

Professor Todorov is Bulgarian-born and currently on twelve months sabbatical, having lived and worked in Mexico for the past eleven years.

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Professor **Albert Ferrer**  
*Universitat Politècnica de Catalunya (UPC), Barcelona, Catalonia, Spain*

Professor Ferrer visited CIAO for ten days in early February 2009, as a guest of Dr Adil Bagirov.

While here he collaborated with Dr Zari Dzalilov and Dr Bagirov, and also presented a seminar titled "DC optimization and applications" to staff and research students.



# Research Laboratory News

## ICSL: Internet Commerce Security Laboratory

Director: A/Professor Paul Watters



ICSL has experienced rapid growth in research student enrolments during the past several months, with Ms Rosemary Torney, Ms Kylie Turville and Mr Mofakharul Islam all starting research degrees.

These candidates were selected from a large pool of applicants – congratulations to each of them!

ICSL staff are organizing a workshop on Cybercrime and Trusted Computing, to be held at the Autonomic and Trusted Computing Conference in July 2009.

The scope of the workshop is reasonably narrow, to ensure a complementary match between capability and need.

ICSL plans to pursue five research priorities in 2009:

1. **Profiling** – turning cybercrime event data into meaningful evidence, enabling a law enforcement response to online fraud.
2. **Recovery processes** – understanding how customers recover their “identity”, and working to make it easier.
3. **Malware** – continuing applied research into advanced malware techniques, and systemic weaknesses in botnet-supported hosting platforms.
4. **Fraud Detection** – adapting innovative algorithms to detection in transaction streams.
5. **Forensics** – automating away the time-consuming elements of forensic analysis of customer machines.

## HIL: Health Informatics Laboratory

Leader: Dr Andrew Stranieri



HIL was recently involved in the organising of ACKMIDS 2008, the Australian Conference on Knowledge Management & Intelligent Decision Support Systems.

ACKMIDS 2008 was held on 8-10 December 2008 at the University of Ballarat, and offered participants an opportunity to generate and explore innovative ideas, and share their experiences in knowledge management.

It was organised jointly by CIAO and the Centre for eCommerce and Communications, and co-hosted by the Knowledge Management Research Program and the Monash Centre for Community Networking Research (CCNR).

This three-day event attracted a range of interested delegates, with keynote addresses presented by speakers from South Africa and Hong Kong.

Seven CIAO staff members published papers at ACKMIDS following a blind reviewing process, and participants were impressed by the depth and breadth of CIAO submissions.

The conference ran very smoothly, and our special thanks to Dr Richard Dazeley for participating on the organising committee.

The conference served to enhance HIL's reputation in the knowledge management research community, and has led to a direct invitation to submit a journal paper to a high ranking journal.

## Australian Healthcare Messaging Laboratory

Director: Ms Jane Gilbert



Congratulations to Ms Jane Gilbert, who was recently appointed Director of the Australian Healthcare Messaging Laboratory (AHML).

AHML is a globally accredited online testing laboratory for the technical evaluation and certification of electronic messages in healthcare applications.

It provides:

- > message testing services
- > certification and compliance services
- > implementation of client specifications

AHML is headquartered within CIAO at the University of Ballarat.

It is accredited by the National Association of Testing Authorities (NATA) to ISO/IEC 17025:2005 in the field of Information Technology, for the testing of healthcare messages.



## Federal Government's Education Investment Fund (EIF)

An application was recently lodged for a new research building at UB.

If successful, this would directly impact CIAO, as it would house the CIAO Directorate, the Alexander Rubinov Professorial appointee, CIAO Research Group Leaders, research staff & students.

We hope to know the outcome of this exciting application by the time of the May 2009 Federal Budget.

## Grant Applications Submitted

### VicHealth Research Project 2009

Topic: Bridging the digital divide between the institution and civil life: enhancing the life and health of people with intellectual disabilities and/or autistic spectrum disorders through emerging technologies

UB Personnel: Associate Professor Paul Watters & Dr G Marks, School of Education  
Funding Requested: \$83,862

## Grants Awarded

### Deakin University & University of Ballarat Collaboration Fund

Project Leader: Assoc Professor Paul Watters  
Topic: Novel Multiple Classification and Clustering Algorithms for Anti-Phishing  
UB Project Personnel: Associate Professor Paul Watters, Professor John Yearwood and Dr Xinwen Wu

Deakin Project Personnel: Professor Matthew Warren, Dr Jemal Abawajy and Dr Lei Pan  
Funding Provided: \$25,000

### Early Career Researcher Grant #1

Researcher: Dr Richard Dazeley (below)  
Topic: Discovering hidden information in massive databases using an improved incremental induction algorithm  
Funding received: \$9265



### Early Career Researcher Grant #2

Researcher: Dr Nadezda Sukhorukova  
Topic: Automatic sleep stage identification using nonsmooth optimization techniques  
Funding received: \$9425

### Early Career Researcher Grant #3

Researcher: Dr Ahmed Bani-Mustafa (below)  
Topic: Developing a new class of model diagnostic tools for linear mixed models based on recursive residuals  
Funding received: \$9430



## Conferences & Seminars

### AI-08, 21st Australasian Joint Conference on Artificial Intelligence 2008

CIAO's strong presence was noted at this conference, held in Auckland, New Zealand on 2-5 December 2008.

Six papers were presented, and publication details can be found on the penultimate page of this newsletter.

### Building Networks in Statistics Education

Mr Peter Martin was invited to attend this forum at Queensland University of Technology, Brisbane on 9-10 February 2009. While there he also chaired the breakout session on 'Interactions with Employers'.

The forum was part of an Australian Learning and Teaching Council (ALTC) Senior Fellowship Program, which aimed to identify common issues, challenges and resources in the learning and teaching of statistics.

### CAPP 2008: International Conference on Applied Probability and Statistics

Mr Peter Martin attended this conference in Hanoi, Vietnam from 30 November to 3 December 2008, and presented a paper titled "Assessment and Evaluation of a Six Sigma Program".

### Workshop on Sequence Design: Applications in Communications & Cryptography

Dr Long Jia attended this workshop in Melbourne on 4-6 December 2008, which was hosted by AMSI, the Australian Mathematical Sciences Institute.

## Seminars at UB

Recent seminars have been presented by:

> *Professor Juan Enrique Martinez Legaz*, Universitat Autònoma de Barcelona, Barcelona, Spain

Topic: Some generalizations of Rockafellar's surjectivity theorem

> *Professor Maxim Todorov*, University of Puebla (UDLA), San Andres, Mexico

Topic: New concepts of active constraints

> *Professor Albert Ferrer* (pictured below), Department of Applied Mathematics, Universitat Politècnica de Catalunya (UPC), Barcelona, Catalonia, Spain

Topic: DC optimization and applications



## Staff News

### New staff member : Dr Zhaohao Sun

We welcome Dr Zhaohao Sun to CIAO and ITMS. Dr Sun's research interests include intelligent techniques in e-commerce and web services, soft computing and intelligent computing.

Dr Sun has joined CIAO's Data Mining and Informatics Research Group and Internet Commerce Security Laboratory.

He is also lecturing in our School in e-commerce management and information technology management.

Dr Sun (below) has previously worked at Hebei Normal University, Hebei Province, China, the University of Wollongong, and RWTH Rheinisch-Westfaelische Technische Hochschule in Aachen, Germany.



### New Research Co-ordinator

We welcome Dr Alex Kruger to the role of Research Co-ordinator for CIAO and the Graduate School of Information Technology & Mathematical Sciences.

He takes over from Dr Andrew Stranieri, who has a full plate of other duties.

### Research Higher Degrees Sub-Committee

Congratulations to Dr Phil Smith who has been elected to sit on UB's Research Higher Degrees Sub-Committee.

### Lecturer of the Year 2008

Congratulations to Mr Grant Meredith, who was recently named the University of Ballarat's Lecturer of the Year.

### Higher Education Curriculum Committee

Congratulations to Ms Charlynn Miller who has been elected Chair of UB's Higher Education Curriculum Committee.

### PhD Scholarships

Congratulations to Ms Kylie Turville and Ms Rosemary Torney, who have been awarded Internet Commerce Security Laboratory (ICSL) PhD Scholarships.

### More baby joy

Congratulations to Ms Kym Haymes and her husband, Matt, who recently welcomed a baby boy - Riley - into their family.



# Research Student Profile:

## *Mr Daniel Morales Silva*



Mr Daniel Morales Silva came to Ballarat from Perú in November 2005 as a student of the late Professor Alex Rubinov, the Founding Director of CIAO.

His PhD topic is “**G-coupling Functions and Strongly Star Shaped Cones**”, and he is supervised by Dr David Yost, Dr Jason Giri and Dr Regina Burachik (University of South Australia).

Daniel’s research addresses the **duality of nonlinear programming problems**, as well as the geometric structure of a certain family of cones.

To discuss this topic, it is necessary to begin with **linear programming**, where the first and most complete duality results in mathematical programming were obtained.

Dual linear programs have some interesting properties which, in addition to being elegant from a theoretical point of view, are also significant for computational purposes.

The elegant duality theorems in linear programming have encouraged many researchers to extend the notion of duality to non-linear problems, however early results in this direction were not satisfactory.

During the late 1960s a more complete duality theory for convex problems emerged. This theory can be derived along a number of different lines.

The one chosen by many researchers is based on the concept of conjugate functions, introduced by Fenchel and developed to its full strength by Rockafellar in a series of works.

The next step was to consider non-convex optimization problems. In this case, a

tool that is becoming more important is generalized conjugation.

In Daniel’s research project, a family of coupling functions have been introduced - called **the G-coupling functions** - which have allowed him to observe and study duality schemes in a different way.

In a completely different direction, he also researches **Strongly Star- Shaped Cones**.

In **Vector Optimization problems**, there is a partial order which provides direction on which object is more preferable. If this partial order is induced by a solid convex cone, the theory for facing this situation is already developed.

However, when dealing with real problems, the partial order is often induced by a different kind of cone.

Rubinov and Gasimov studied the partial orders induced by strongly star-shaped cones, and introduced a technique for a certain sub-family of these cones.

In Daniel’s work, he provides evidence that the **results obtained by Rubinov and Gasimov** can be extended to the whole family of proper closed strongly star-shaped cones.

Daniel is currently nearing the completion of his research, and is finalising his thesis for submission and examination.

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## PhD Thesis Submission

Congratulations to the following students, who have recently submitted their theses for examination:

### *Mr Guillermo Pineda-Villavicencio*

PhD Topic: Improving upper & lower bounds on the order of large graphs under degree & distance constraints  
Supervisors: Professor John Yearwood and Professor Mirka Miller

### *Mr Bahadorreza Ofoghi*

PhD Topic: Question answering enhancement via encapsulated frame semantics

Supervisors: Professor John Yearwood and Dr Liping Ma

### *Mr Shamsul Huda*

PhD Topic: Hybrid Training Approaches to Hidden Markov Model Based Acoustic Model for Automatic Speech Recognition

Supervisors: Professor John Yearwood, Dr Adil Bagirov and Dr Eldar Hajilarov

### *Mr Asef Nazari Gangelou*

PhD Topic: Derivative Free Methods for Nonsmooth and Global Optimization with Application in Cluster Analysis  
Supervisors: Dr Adil Bagirov and Dr Musa Mammadov

Note: These four students have now been appointed to Research Associate positions in the School.

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## More CIAO Visitors

### *Mr Adrien Ugon*

*Pierre & Marie Curie University  
Paris, France*

Mr Ugon visited CIAO for two months from December 2008 to January 2009, to continue working on the sleep apnoea project with CIAO researchers Dr Julien Ugon, Dr Nadia Sukhorukova and Dr Andrew Stranieri.

This collaborative project links UB with the Sleep Laboratory at Tenon Hospital, Paris, which has provided a large amount of sleep apnoea data for analysis.

### *Associate Professor Jianjun Zhang University of Puebla, San Andres, Mexico*

Another recent visitor to CIAO was Professor Jianjun Zhang, from the Mathematics Department of Shanghai University (SU) in Shanghai, China.

Dr Zhang spent two months in Ballarat, working with Chief Investigator Dr Musa Mammadov on an Australian Research Council Discovery Project titled “Constrained and Stable Solutions on Nonlinear and Semi-Smooth Equations”.

Dr Zhang (pictured below) has a Masters in Computational Mathematics, and a PhD in Applied Mathematics.

He has worked at SU since 1993, where he also lectures in mathematics and supervises Masters students.

This was Dr Zhang’s first visit to Australia.



## Publications

### *Journal Papers: Submitted/Accepted*

**Bagirov, A., Clausen, C. & Kohler, M.** (2008) Estimation of a regression function by maxima of minima of linear functions, IEEE Trans on Information Theory (A).

**Kelarev, A.V, Yearwood, J.L. & Watters, P.** (2008) Rees matrix construction for clustering of data, Journal of the Australian Mathematical Society (S).

**MacFadyen, A., Stranieri, A. & Yearwood, J.** (2008) Dramatic Level Configuration in Interactive Narratives, Journal of Games and Cultures (A).

**Martin, P., Harvey, J., Payne, W. & Culvenor, J.** (2008) Effect of a Nurse Back Injury Prevention Intervention on the Rate of Injury Compensation Claims, Journal of Safety Research (A).

**Ollington, R., Vamplew, P. & Swanson, J.** (2008) Incorporating Expert Advice into Reinforcement Learning Using Constructive Neural Networks, Constructive Neural Networks (Springer Studies in Computational Intelligence series) (A).

**Osman, D., Yearwood, J. & Vamplew, P.** (2009) System Fusion to Improve Opinion Detection in Weblogs for Market Research, Journal of Online Information Review, special issue "Web Mining for E-Commerce & E-Services" (A).

**Yearwood, J., Bagirov, A. & Kelarev, A.** (2008) Optimization methods and the k-committees algorithm for clustering of ITS sequence data, Journal of Applied Computational Mathematics (S).

### *Journal Papers: Published*

**Herbert, S. & Pierce, R.** (2008) An 'Emergent Model' for Rate of Change, International Journal of Computers for Mathematical Learning, Vol.13, No.3, pp.231-249.

**Huda, S., Yearwood, J. & Togneri, R.** (2009) A Constraint-Based Evolutionary Learning Approach to the Expectation Maximization for Optimal Estimation of the Hidden Markov Model for Speech Signal Modelling, IEEE Transactions on Systems, Man, and Cybernetics, Part B: Cybernetics, Vol.39, Issue 1, pp.182-197.

**Morris, S. & McPhail C.** (2008) Identifying and distinguishing various varieties of abelian topological groups, Dissertationes Mathematicae, No.458, pp.1-45.

**McPhail, C. & Morris, S.** (2008) Varieties of abelian topological groups & scattered spaces, Bulletin of Australian Mathematical Society, Vol.78, No.3, pp.487-495.

**Ofoghi, B., Yearwood, J., and Ma, L.** (2009) The impact of frame semantic annotation levels, frame-alignment techniques, and fusion methods on factoid answer processing, Journal of the American Society for Information Science and Technology (JASIST), Vol.60, Issue 2, Feb 2009, pp.247-263.

**Yearwood, J.L. & Stranieri, A.** (2008) A study of frameworks for structured reasoning on reasoning quality and knowledge, Learning & Teaching: an international journal in classroom pedagogy, Vol.1, No.1, pp.71-90.

**Yearwood, J.L. and Stranieri, A.** (2009) Deliberative Discourse and Reasoning from Generic Argument Structures, Artificial Intelligence & Society, Vol.23, No.3, pp.353-377.

### *Conference Papers: Submitted/Accepted*

**Jia, L., Stranieri, A. & Shen, J.** (2008) An Intelligent Learning Environment for Traditional Chinese Medicine practitioners and students, Health Informatics Conference, HIC 2008 (A).

**Muecke, N., Stranieri, A. & Miller, C.** (2008) Re-Consider: The Integration of Online Dispute Resolution & Decision Support Systems, International Workshop on Online Dispute Resolution Florence, Jurix 2008 (A).

**Quinn, A., Jelinek, H., Stranieri, A. & Yearwood, J.** (2008) AWSum - Applying Data Mining in a Health Care Scenario, ISSNIP 2008 Symposium on Pervasive Sensing and Computing for Healthcare in Remote Communities, HRC 2008 (A).

### *Conference Papers: Published*

**Dazeley, R. & Kang, B.** (2008) Generalisation with symbolic knowledge in online classification, Pacific Rim Knowledge Acquisition Workshop, PKAW 2008, at Tenth Pacific Rim International Conf on Artificial Intelligence, PRICAI-08, pp.122-135.

**Dazeley, R. & Kang, B.** (2008) Prediction using a symbolic based hybrid system, Pacific Rim Knowledge Acquisition Workshop, PKAW 2008, at Tenth Pacific Rim International Conference on Artificial Intelligence, PRICAI-08, pp.136-143.

**Dazeley, R. & Kang, B.** (2008) The

viability of prudence analysis, Pacific Rim Knowledge Acquisition Workshop, PKAW 2008, at Tenth Pacific Rim International Conference on Artificial Intelligence, PRICAI-08, pp.107-121.

**Dazeley, R. & Kang, B.** (2008) An Approach for Generalising Symbolic Knowledge, AI 2008 - Advances in Artificial Intelligence, LNAI 5360, pp.379-386.

**Dazeley, R. & Kang, B.** (2008) Detecting the Knowledge Boundary with Prudence Analysis, AI 2008 - Advances in Artificial Intelligence, LNAI 5360, pp.482-489.

**Layton, R., Vamplew, P. & Turville, C.** (2008) Using Stereotypes to Improve Early-Match Poker Play, AI 2008 - Advances in Artificial Intelligence, LNAI 5360, pp.584-594.

**Ofoghi, B., Yearwood, J. & Ma, L.** (2008) FrameNet-Based Fact-Seeking Answer Processing: A Study of Semantic Alignment Techniques and Lexical Coverage, AI 2008 - Advances in Artificial Intelligence, LNAI 5360, pp.192-202.

**Quinn, A., Stranieri, A., Yearwood, J. & Hafen, G.** (2009) A classification algorithm that derives weighted sum scores for insight into disease, HIKM Health Informatics & Knowledge Management Conference, at ACSW 2009, Auckland, New Zealand, CRPIT Vol.97, pp.13-17.

**Tilakaratne, C., Mammadov, M. & Morris, S.** (2008) Predicting Trading Signals of Stock Market Indices Using Neural Networks, AI 2008 - Advances in Artificial Intelligence, LNAI 5360, pp.522-532.

**Vamplew, P., Yearwood, J., Dazeley, R. & Berry, A.** (2008) On the Limitations of Scalarisation for Multi-Objective Reinforcement Learning of Pareto Fronts, AI 2008 - Advances in Artificial Intelligence, LNAI 5360, pp.372-379.

**Yearwood, J., Kang, B. & Kelarev, A.** (2008) Experimental investigation of classification algorithms for ITS dataset, Pacific Rim Knowledge Acquisition Workshop, PKAW 2008, at Tenth Pacific Rim International Conference on Artificial Intelligence, PRICAI-08, pp.107-121.

**Zarnegar, A., Vamplew, P. & Stranieri, A.** (2009) Inference of Gene Expression Networks Using Memetic Gene Expression Programming, 32nd Aust. Computer Science Conference (ACSC), ACSW 2009, Auckland, N.Zealand, 19-23 Jan 2009, CRPIT Vol.91, pp.29-35.





Centre for Informatics & Applied Optimization

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Photograph by Elizabeth Matuschka: vivid autumn tones at Mt Helen Campus, University of Ballarat, Ballarat, Australia