

# MSSANZ NEWSLETTER

## MODSIM2015 INTERNATIONAL CONGRESS

Partnering with industry and the community for innovation and impact through modelling

Gold Coast Convention and Exhibition Centre, Broadbeach, Australia  
29 November to 4 December 2015.

Scientific Program Co-Chairs: Robert Anderssen, Tony Weber  
Congress Co-Convenors: Tony Weber, Malcolm McPhee

### CALL FOR SESSIONS AND ABSTRACTS

<http://www.mssanz.org.au/modsim2015/>

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#### MODSIM2015 Key Dates

- Deadline for Separate Extended Abstracts OR Full Papers July 3 2015
- Early Bird Registration closes August 28 2015
- Deadline for submission of final paper October 2 2015



We are pleased to announce that the **21st International Congress on Modelling and Simulation (MODSIM2015)** is being held at the Gold Coast Convention and Exhibition Centre at Broadbeach, Queensland, from Sunday November 29 to Friday December 4, 2015.

“Partnering with industry and the community for innovation and impact through modelling” represents a key motto that encapsulates the goals of MODSIM. It acknowledges the role and impact of real world applications on the development of innovative solutions for industry and the community. It complements the theme of MODSIM 2013 in that “Adapting to Change” represents why there is an ongoing quest for innovation by the community and industry.

ASOR (the Australian Society for Operations Research) and DORS (the DSTO led Defence Operations Research Symposium) will be joining us at MODSIM and running Streams in their topic areas. Planning for the Congress is well underway with more than 100 sessions proposed. The Congress Streams, each of which has numerous sessions, are:

#### Applied and computational mathematics

Stream leaders: Barry Croke and Roger Braddock

#### Biological systems

Stream leaders: David Mayer and Malcolm McPhee

#### Computer science and engineering

Stream leaders: Peter Fitch and Tim Peterson

#### DORS - Defence and homeland security modelling

Stream leaders: Fred Bowden, David Marlow and Denis Shine

#### Economics and finance

Stream leaders: Michael McAleer and Chia-Lin Chang

#### Energy

Stream leader: John Boland

#### Environment and ecology

Stream leaders: Andre Zerger and Brett Bryan

#### Global change and natural hazards

Stream leaders: Jason Evans and Albert van Dijk

#### Health informatics

Stream leader: Irene Hudson

#### Integrated infrastructure and urban planning

Stream Leader: Pascal Perez

#### Operations research

Stream leaders: Paul Gaertner, Simon Dunstall and Julia Piantadosi

#### Participatory decision making and modelling social systems

Stream leaders: Susan Cuddy and Sondoss Elsayah

#### Water resources

Stream leaders: Francis Chiew and Jai Vaze



## Program Chairs' Report on MODSIM2015

MODSIM2015  
Committee Members

**Program Co-chairs**  
Dr Robert Anderssen  
Mr Tony Weber

**Congress Co-convenors**  
Mr Tony Weber  
Dr Malcolm McPhee

**Committee Members**  
Dr Yun Chen  
Dr David Cox  
Ms Susan Cuddy  
Dr Sondoss Elsayah  
Dr Paul Gaertner  
Prof Tony Jakeman  
Dr Julia Piantadosi  
Dr David Post  
Dr Russell Richards  
Dr Oz Sahin

## Program Chairs' Report on MODSIM2015

We would like to draw members' attention to some important information about the abstract/paper submission and review process.

### **Abstract/Paper Submission and review**

The submission and review process will be handled exclusively using our improved online conference management tool accessible through the Congress website. This Congress, we are changing terminology slightly and are calling for Expressions of Interest rather than preliminary abstracts to avoid confusion with Extended Abstracts which are an alternative to full papers. We therefore invite submission of high quality Expressions of Interest (Title and 250-500 words) on all aspects of modelling and simulation to a relevant session.

It may still be possible to submit an expression of interest, please visit the home page at <http://www.mssanz.org.au/modsim2015> and register as an author through the User Login.

### **Extended Abstracts/Papers must be submitted by 3 July 2015.**

The extended abstract should be a complete description of the problem area, broad findings and outcomes or implications and should hence be self-contained.

Extended abstracts and papers will be reviewed by independent reviewers and may require revision before publication on the Congress website.

### **Final papers are due 2 October 2015.**

Accepted extended abstracts and papers will be made available for downloading from the Congress website if and only if a contributing author gives an oral presentation at the Congress. Only full papers will be published in the Congress Proceedings. All recent Proceedings have been listed by Thomson Reuters ISI.

For more information on the congress, please check out the website at <http://www.mssanz.org.au/modsim2015>.

Finally, we look forward to your participation in the Congress as delegates, presenters and/or session organisers. It will be an excellent opportunity to discuss the challenges, solutions and ideas in all areas of modelling and simulation.

**Bob Anderssen & Tony Weber**  
**MSSANZ**

## President's Report

Dear All,

As the first new President of MSSANZ in quite some time, first of all I'd like to extend my greetings to all of our new members, and renew my greetings to all of our long-standing members. You have all probably been used to Tony Jakeman sending out these messages, as he has been the MSSANZ President for what seems like forever. I'd like to thank Tony sincerely for his contribution to the Society, and let you know that as Society Secretary, Tony is continuing to have a huge input into the Executive team. I'd also like to assure you that the basic functions of MSSANZ will not change dramatically. We will continue to do what we do so well – organise the biennial MODSIM Congress that has come to be recognised as one of the pre-eminent modelling conferences in the world.

Speaking of which, preparations for MODSIM 2015 on the Gold Coast in December are proceeding very well indeed. The organising committee led by Tony Weber and Malcolm McPhee have been meeting regularly and all is on track for what looks to be the biggest and best MODSIM ever. I expect an attendance of around 700-800, which would be absolutely splendid.

We have worked hard last year to improve the functionality of our conference management tool (OCS) to make it easier to use for both authors, reviewers and session organisers to use. This was based in part on the feedback we received from the members via the survey that we sent out after MODSIM 2013. We received over 150 responses which is a fantastic return rate, and we have used these to improve all aspects of MODSIM 2015. I think the usefulness of these responses means that we will continue to send these surveys after each conference.

One particularly surprising aspect of the survey was the support from members for a 5 day conference with a rest day (supported by over 70% of the members), with a fairly even split between a rest day, related workshops, science related field trips and leisure field trips. We will be working with members and travel agents on the Gold Coast to provide as many of these options as possible. There was also overwhelming support for the conference dinner to be held on the Thursday.

Members were also keen to see posters introduced at MODSIM conferences. While it is too late to do that now for MODSIM 2015, it is something we will definitely look at for MODSIM 2017. Speaking of which, we are looking into possible locations for MODSIM 2017 right now. Currently Hobart is looking like the outstanding bid, but any members with an interest in hosting this (or future conferences) should contact me.

**David Post**  
MSSANZ President



President's Report



**MODSIM  
2013**

20th International Congress  
on Modelling and Simulation

## Report on MODSIM2013/20<sup>th</sup> International Congress on Modelling and Simulation Adelaide Convention Centre 1 to 6 December 2013.



**Adelaide, with its beautiful weather was the location of the 20<sup>th</sup> International Congress on Modelling and Simulation (MODSIM 2013).** The Congress was held at the Adelaide Convention Centre, from 1 to 6 December 2013. It was held jointly with the **22nd National Conference of the Australian Society for Operations Research (ASOR 2013)** and the **DSTO led Defence Operations Research Symposium (DORS 2013)**. The theme for this event was **Adapting to Change: the multiple roles of modelling**. Adapting to Change might well be the motto of the future for South Australia. Not only is the motto at the head of the movement towards greening the delivery of energy through renewables, but, as the downstream end of the Murray–Darling River System, South Australia has an intense interest in the changing modes of river operation. As such, Adelaide was certainly an appropriate venue for this particular version of the highly successful series of MODSIM congresses.

### Report on MODSIM2013

MSSANZ aims to promote, develop and assist in the study of all areas of modelling and simulation.

The society's main activity is organising the MODSIM biennial conferences on modelling and simulation (the first in 1974). These conferences are highly regarded and well attended and attract strong student representation through the award of student prizes and subsidised registration

The Congress was very well attended, with over 780 delegates including 130 students resulting in a full programme of fourteen parallel sessions. In total over 800 contributed talks were presented covering a wide range of topics in Applied and computational mathematics; Biological systems; Computer science and engineering; Defence and homeland security modelling; Defence operations research; Economics and finance; Energy; Environment and ecology; Health informatics; Integrated infrastructure and urban modelling; Participatory decision making and modelling social systems; and Water resources. The full program and abstracts are available at <http://www.mssanz.org.au/modsim2013/program.html>

Eight plenary talks were presented at the Congress all of which were of an excellent standard. This year's plenary speakers were: Professor Graeme Dandy, The University of Adelaide, Australia; Professor Jerzy Filar, Flinders University, Australia; Associate Professor Hedwig van Delden, Research Institute for Knowledge Systems, The Netherlands; Dr Jeff Kepert, Bureau of Meteorology, Australia; Dr Maja Schlüter, Stockholm Resilience Centre, Sweden; Professor Paul Whitehead, University of Oxford, United Kingdom; Dr Alex Zelinsky, Defence Science and Technology Organisation, Australia; Dr Russell W. Glenn, The Australian National University, Australia. Further details of the talks, including short biographies of the speakers, are at the congress website: <http://www.mssanz.org.au/modsim2013>. For the wonderful selection of plenary speakers, we owe our thanks to the Program Committee.

The social activities were a highlight of the Congress and well attended and enjoyed by the delegates. The Sunday evening opening session, plenary talk and welcome reception were a thriving success. The Monday evening ice-breaker overlooking the Riverbank Promenade provided delegates a relaxing opportunity to network and reflect on a full day of intellectual exchange. The Congress dinner was another memorable event of MODSIM 2013. It was held at the Adelaide Convention Centre on Thursday evening with musical entertainment by EtypeJazz. A highlight of the dinner was the presentation of awards to outstanding researchers in various stages of their careers.



The following awards were announced:

#### Fellows

Prof Chia-Lin Chang, National Chung Hsing University,  
Assoc Prof Felix Chan, Curtin University of Technology  
Dr Anthony Dekker, DSTO  
Mr Tony Weber, BMT WBM, Brisbane

#### Biennial Medals 2013

Prof Natasha Boland, University of Newcastle  
Prof Graeme Dandy, University of Adelaide  
Prof Shiqing Ling, Hong Kong University of Science and Technology



#### ECREs 2013

Asst Prof Marit Kragt, University of Western Australia  
Dr Dongryeol Ryu, University of Melbourne  
Assoc Prof Matthew Hipsey, University of Western Australia

For further details of the awards please see MSSANZ website: <http://www.mssanz.org.au/>

We are very grateful to Carmel Pollino and David Post and the other members of the Student Awards Program Committee who took up the challenge of selecting prize winners from a record 130 student talks. The student awards were announced on Friday afternoon at the closing ceremony. The Organising Committee gratefully acknowledges the financial support of our sponsors, CSIRO, Australian Bureau of Meteorology, Centre for Industrial and Applied Mathematics, University of South Australia, Goyder Institute for Water Research, Government of South Australia, AustMS, ANZIAM, AMSI and Simulation Australia.

We wish to thank the Stream Leaders for advertising MODSIM 2013 to the wider scientific community, encouraging colleagues to submit session proposals, assisting with the identification of sessions and reviewing of extended abstracts and papers. This was a great success given we had over 100 sessions at MODSIM 2013. Sincere thanks to our Stream Leaders, Barry Croke, Roger Braddock, Malcolm McPhee, David Mayer, Rob Argent, Tim Peterson, David Marlow, Denis Shine, Fred Bowden, Michael McAleer, Les Oxley, Graham Nathan, John Abraham, Zhao Feng Tian, Andre Zerger, Brett Bryan, Irene Hudson, Pascal Perez, Geoff Syme, Paul Gaertner, Susan Cuddy, Brian McIntosh, Francis Chiew and David Post. One of the other major activities for Stream Leaders was the identification of Keynote speakers. Twelve keynote talks were presented at MODSIM 2013. Details of the keynote talks listed in the program available at <http://www.mssanz.org.au/modsim2013/program.html>

Once again, it was largely the hard work put in by the session organisers which led to the success of the Congress. They advertised, organised, refereed, and also chaired their sessions. We thank the session organisers for their contribution in ensuring the scientific quality of papers presented at MODSIM2013. From our perspective as Directors, MODSIM 2013 was a great success, and thanks are due to the following people for their assistance in achieving this: Tony Jakeman, Robert Anderssen, Susan Cuddy, Fred Bowden, Paul Gaertner, Wendy Merritt, David Post, Clare Southerton, and to Karen Mobbs, Peter Manger and Andrew Hicks. We also wish to thank all the members of the Organising and Program Committee.

Finally, we look forward to your meeting with you again in Broadbeach, Queensland, Australia for MODSIM 2015.

**Julia Piantadosi and John Boland**  
**MODSIM2013 Co-convenors**

Report on  
MODSIM2013



## 2014 Fellows

Julia Piantadosi

John Boland

Wendy Merritt

Don Kulasiri

## Awards 2014 Fellows

### Dr Julia Piantadosi

Julia Piantadosi's research focus lies in the application of advanced mathematical tools to the solution of unsolved problems relating to the management of water supply and distribution and stochastic rainfall modelling



on various time scales for a variety of applications. Other research interests include proactive responses to climate change,

risk analysis, integrated challenges around the water-energy nexus and waste management. Dr Piantadosi was the co-convenor and co-program chair of the 20th International Congress on Modelling and Simulation (MODSIM2013) held in Adelaide. Her continued involvement with the Australian and New Zealand Industrial and Applied Mathematics (ANZIAM) division demonstrates her commitment to promoting mathematical research relevant to applications of mathematics and to encourage the education and training of industrial and applied mathematicians in all areas of modelling and simulation.

### Professor John Boland

Prof. Boland graduated with a PhD in Applied Mathematics in 1996 from University of Adelaide, focusing on modelling heat flows in domestic dwellings. He combines mathematical, statistical and time series techniques, particularly in the area of environmental modelling and assessment. The result of this is that he has wide ranging applications of his approach to applying rigorous mathematical techniques to real world problems. Thus, his seventeen nationally competitive grants, including eight ARC Discovery and Linkage since 2000, cover a diversity of fields from



water resource management, renewable energy and its integration into the electricity grid, food waste reduction, solar and wind energy forecasting, and climate change adaptation to ecosystem regeneration. He has had sixteen PhD students successfully complete, and they have been involved in about half of his 140 research publications.

### Dr Wendy Merritt

Dr Wendy Merritt is Fellow at the Fenner School with expertise in natural resource assessment and modelling and the design and development of models and Decision Support Systems. Most recently, her research has developed and linked socio-economic models based on the sustainable livelihoods



framework to groundwater resource availability to explore the impact of watershed development on livelihood indicators. Wendy

is a past Treasurer of MSSANZ Inc.

### Professor Don Kulasiri

Don Kulasiri is Professor in Computational Modelling and Systems Biology since 1999 at Lincoln University, New Zealand. He obtained a BSc (Eng) from University of Peradeniya, Sri Lanka (1980); MS(1988) and PhD (1990), both in Engineering, from Virginia Tech, USA. He authored/co-authored 150 publications including two research monographs. He has been a visiting professor to Oxford University, Princeton University, and Stanford University. His research contributions include: a stochastic and mechanistic theory for Non-Fickian solute transport in porous media; models for circadian rhythms at intra-cellular level; models for p53 dynamics associated with DNA damage; modelling of meiosis-meiotic



## Awards

### 2014 Fellows



DNA damage; modelling of meiosis-meiotic initiation in yeast; and modelling intracellular pathways in neurons related to memory formation and impairment. He was a panel member for the university research quality evaluation exercise in 2012 by NZ government. He has been a member of MSSANZ since 1993.

#### Professor Kazumitsu Nawata

Kazumitsu Nawata is currently a Professor in the Department of Technology Management for Innovations, Graduate School of Engineering, University of Tokyo. He has a Bachelor of Engineering from the University of Tokyo, an MA in Economics from Pennsylvania State University, and PhD in economics from Stanford University. His research interests include: theoretical and empirical econometrics, statistics, health economics, labor economics, data analysis, and energy and mineral economics.



#### Professor David Allen

David Allen is an Adjunct Professor of Finance in the Centre for Applied Financial Studies at the University of South Australia and a Visiting Professor, School of Mathematics and Statistics, the University of Sydney. He is also the Director of Dallen (WA) PTY Ltd. He has an Honours degree in Economics from St. Andrews University in Scotland (1970), an M.Phil in the History of Economic thought completed at Leicester University in England (1976) and a Ph.D in Finance from the University of Western Australia (1996). He is a Fellow (F. Fin) of the Financial Services Institute of Australia and was a member of the executive of the ARC funded Financial Integrity Research Network for the original 5 years from its inception when it was funded by the ARC.



### 2014 Fellows

Kazumitsu Nawata

David Allen

## Awards

### 2013 Biennial Medallists

#### Professor Natasha Boland

Prof. Natasha Boland held the position of Professor of Applied Mathematics at the University of Newcastle, Australia from 2008-2014, a role she took up after completing her PhD at the University of Western Australia in 1992, followed by two years of postdoctoral research at the University of Waterloo, Canada, and the Georgia Institute of Technology, respectively, and 13 years with the University of Melbourne. She is an expert in the field of integer programming,



and a leading exponent of its application to address complex problems in government and industry. Her contributions to the field have spanned theory, algorithms, modelling and applications, across methodologies such as column generation and Lagrangian relaxation, polyhedral analysis and branch-and-cut methods, and meta-heuristics, in domains as diverse as mining, renewable energy, airline planning and cancer radiotherapy treatment, with emerging interests in maintenance scheduling and water management. She has published over 50 articles in international scientific journals, and has held 8 nationally competitive large grants in the past, currently holding 5 more.

### Biennial Medallists

Natashia Boland



## Biennial Medallists

Graeme Dandy

Shiqing Ling

## Early Career Research Excellence (ECRE) Awards

Marit Kragt

## Awards

### 2013 Biennial Medallists

#### Professor Graeme Dandy

Prof. Graeme Dandy is an Emeritus Professor in Civil and Environmental Engineering at the University of Adelaide having retired as Professor earlier this year. He has been employed by the University of Adelaide since 1979 and was Professor of Civil and Environmental Engineering from 2000 to 2014. His research interests include the optimisation of water resources and environmental systems and the use of artificial neural networks for forecasting water resources variables. He has more than 200 refereed publications and has also attracted more than \$5m of research funding in these fields. Prof. Dandy is a Fellow of the Academy of Technological Sciences and Engineering and a Fellow of Engineers Australia. He is also co-founder, director and technical consultant for Optimatics Pty Ltd, a software and consulting company based in Adelaide.



#### Professor Shiqing Ling

Shiqing Ling is currently a Professor in Hong Kong University of Science and Technology. He received his Ph.D. in statistics in 1997 from the University of Hong Kong and was a post-doctoral fellow in econometrics in Department of Economics at University of Western Australia from 1997-2000. He is highly regarded in the areas of statistics and econometrics. He has made a number of significant contributions to time series and econometric modeling, including financial volatilities modeling, long-memory time series modeling and threshold modeling. He has published more than 50 refereed research papers, including 14 papers in the top-four statistical journals and 13 papers in two major econometrics journals. He received the Multa Scripsit Award for Econometric Theory in 2007 and a number of highly competitive Hong Kong RGC Grants.



## Awards

### 2013 Early Career Research Excellence (ECRE) Awards

#### Assistant Professor Marit Kragt

Marit Kragt holds a position as an Assistant Professor at the School of Agricultural and Resource Economics at the University of Western Australia (UWA). She graduated with a Master of Science from Wageningen University, the Netherlands in 2005. She continued her studies in Australia, and completed a Master of Economics and PhD (in Environmental Economics and Integrated Modelling) at the Australian National University in 2006 and 2010 respectively. Marit is a recipient of numerous awards and prizes, including a UWA Early Career Researcher award for Best Publication in 2013 and an Excellence in Honours Supervision award. Marit has a joint position with the CSIRO Sustainable Agriculture Flagship and often collaborates with the CSIRO on research, student supervision, and

publications. With degrees in economics and environmental science, Marit has a strong interdisciplinary background. She is an expert in nonmarket valuation and integrated modelling. Her research focuses on integrating knowledge about socio-economic and biophysical systems, to improve environmental management decisions. She is currently working on climate change mitigation options for Australian agriculture (carbon farming) and on analysing the tradeoffs between carbon farming and biodiversity conservation.

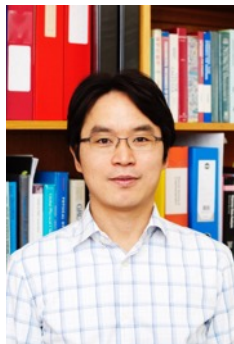




## Awards

### 2013 Early Career Research Excellence (ECRE) Awards

#### Dr Dongryeol Ryu



Dr Dongryeol Ryu is a senior lecturer in the Melbourne School of Engineering, the University of Melbourne. He is an active member of the Environmental Hydrology and Water Resources (EHWR) group in the Department of

Infrastructure Engineering and the leader of the Hydrology and Remote Sensing Group. His research interests include innovative use of remotely sensed land surface features, water and vegetation parameters in hydrological modeling and land surface processes.

Recently, he has been leading various projects that utilize satellite observations of rainfall, soil moisture, and vegetation information with conventional ground motoring networks to calibrate and stochastically update hydrological models. In the past 5 years, Dr Ryu has published 48 peer-reviewed papers and book chapters on the topics of remote sensing and hydrological data assimilation. He is a recipient of a NASA Earth System Science Fellowship and the University of California, Irvine Medal.

#### Associate Professor Matthew Hipsey

Matt is group leader of the Aquatic Ecodynamics (AED) research group at UWA in the School of Earth and Environment. He has multi-disciplinary experience in aquatic system science with a particular focus on aquatic biogeochemical modelling and ecohydrology. His research team includes several post-doctoral, and technical staff and numerous PhD students. He has published



over 40 journal articles and 20 conference papers on modelling aquatic ecosystems in the last 10 years. He is also a major developer of several widely used modeling software packages, and has substantial experience

in applying this experience to real-world problems in complex aquatic landscapes. He has a long history working with government agencies from around Australia and beyond to recommend management strategies for water quality problems and delivering models to support sustainable development of environmental systems.



### Early Career Research Excellence (ECRE) Awards

Dongryeol Ryu

Matthew Hipsey

## Awards

### 2013 Student Awards

#### Lisa Shultz

Lisa Schultz is a PhD candidate in the Centre for Industrial and Applied Mathematics at the University of South Australia. Her thesis is entitled "Traffic-Related Air Pollution: Modelling Vehicle Exhaust Emissions and Optimal Control for Exposure Mitigation". Her research is collaborative with the South Australian Office of the Environment Protection Authority and centralises around modelling South Australian traffic-related pollution emissions, in terms of vehicle speed, as well as reducing population exposure to this harmful pollution. Lisa has a First Class Honours Degree from the

University of South Australia, majoring in Industrial and Applied Mathematics. She currently holds an Australian Post-Graduate Award and, during her time as an undergraduate, she was the recipient of two prestigious scholarships; the Hypatia Scholarship from the University of South Australia, and the Playford Memorial Inc. Trust Scholarship.



### Student Award Recipients

Lisa Schultz



## Student Award Recipients

Alexandra Hogan

Josh Chopin

Mitchell Welch

Ranjodh Singh

## Awards 2013 Student Awards

### Alexandra Hogan

Alexandra Hogan is a PhD candidate at the National Centre for Epidemiology and Population Health at The Australian National University. Alexandra completed her undergraduate studies with honours in



applied mathematics in 2009 at The University of Sydney, after which she worked at the Department of Finance. She is now applying her mathematical knowledge to

epidemiology and infectious diseases, developing models for the transmission of respiratory syncytial virus in young children.

### Josh Chopin

Joshua Chopin is currently a PhD candidate from the Phenomics and Bioinformatics Research Centre at the University of South Australia (UniSA). Josh is a member of the Industry Doctoral Training Centre program with the Australian Centre for Plant Functional Genomics as his industry partner. His thesis title is 'Mathematical and Computational Modelling for the Phenotypic Analysis of Cereal Plants'. Josh's research focuses on algorithms for automatically extracting plant features from images. The ultimate goal is to eventually, through image analysis techniques, relieve plant biologists of the tedious task of manually measuring the results of their experiments. Josh received a First Class Honours Degree in Industrial and Applied Mathematics following a Bachelor of Mathematical Sciences, both at UniSA.



### Mitchell Welch

Mitchell Welch is currently working as a lecturer at the University of New England after completing his postgraduate research and undergraduate studies in computer science. Before completing his postgraduate studies, Mitchell worked as a software engineer, focusing on the development and customisation of cloud-hosted, SaaS, systems and the integration of these information systems for customer relationship management.



Mitchell has worked on several research projects, including the application of artificial intelligence techniques to fingerprint recognition systems and the modules for a national scale model for emerging livestock disease threats to Australia. Mitchell's current research interests involve the development of the technologies to construct large-scale, agent-based, simulations of complex systems with a focus on agricultural applications for decision support.

### Ranjodh Singh

Ranjodh Singh is currently a PhD student at Curtin University. His research topic is Applications of Information Theory to Economics and Finance. This research draws from various topics in Information theory



such as Entropy and applies these to investigate properties of economic and financial data. Ranjodh is also interested in programming and software

development. Prior to joining the PhD program, he worked for a national bank as an analyst for 5 years.

## Awards

### 2013 Student Awards

#### Cameron MacRae

Cameron MacRae is a PhD candidate in the School of Mathematical and Geospatial Sciences at RMIT University, where he is supervised by Andreas Ernst (CSIRO) and Melih Ozlen (RMIT). His research examines the optimisation of power transmission expansion planning problems considering energy storage. Before returning to study in 2011, Cameron spent 12 years working in online classifieds.



remote sensing, publishing several research papers in the course of her PhD.

#### Joseph Guillaume

Joseph Guillaume has recently graduated from the Australian National University (ANU) where his work involved collaboratively creating and applying tools and techniques for managing uncertainty in water resource management, particularly related to groundwater as part of the National Centre for Groundwater Research and Training. This included a framework for managing uncertainty, a methodology for making predictions under uncertainty, a tool that assesses uncertainty by focussing on cross-over points in cost benefit analysis of competing alternatives, and a tool to assess ecological suitability based on elicitation of uncertain expert knowledge. (the topic of his MODSIM2013 talk). He is now a visiting fellow at ANU and has started as a Postdoctoral Research Fellow in the Water and Development Research Group at Aalto University. His work remains focused on efficient and pragmatic methods to improve the management of uncertainty in environmental modelling and decision support.



#### Erika Lawley

Erika Lawley is currently a post-doctoral researcher at the University of Adelaide, where she continues her investigation into use of remote sensing to assess and monitor arid land condition. She recently completed her PhD in Sciences at the University of Adelaide with a thesis entitled: "Satellite remote sensing to monitor land condition and dynamics in arid Australia -Letting the landscape speak for itself". Erika has been involved in native vegetation survey and management for the past fifteen years, publishing scientific papers on her research in coastal vegetation and the impact of weed control on native vegetation and burrowing seabirds. Commencing tertiary studies in 2004, Erika has won numerous awards during her undergraduate studies including the University of Adelaide award for outstanding academic achievement in ecology and management of terrestrial ecosystems. More recently she has combined her love for the arid environment with her expertise in



#### Mun-Ju Shin

Mun-Ju Shin is currently a Postdoctoral Research Fellow of the Catchment Hydrology Research group in Seoul National University (SNU), South Korea. He is also a Visiting Fellow at the Australian National University, where he worked for many years before joining SNU in 2014.



### Student Award Recipients

Cameron MacRae

Erika Lawley

Joseph Guillaume

Mun-Ju Shin





## Student Award Recipients

Mun-Ju Shin

Camila Alvarez-Garreton

Alexandra Klados

## Treasurer's Report

## Awards 2013 Student Awards

Mun-Ju has over 10 years experience as a researcher and engineer in hydrology and water resources. He is highly regarded in the areas of hydrological modelling, uncertainty analysis and sensitivity analysis. Mun-Ju leads and takes part in various projects, and is active in converting research outcomes into products that are widely used by the water industry. His contributions in the climate and water area have allowed policy makers to make more informed risk-based decisions on water planning and management.

### Camila Alvarez-Garreton

Camila Alvarez-Garreton is a PhD candidate from the University of Melbourne. She received her Bachelor of Civil Engineering and Master of Engineering Sciences in Water Resources from The University of Chile. Her research focuses on improving streamflow prediction in poorly monitored or ungauged catchments. She is using satellite rainfall to force a rainfall-runoff model and satellite soil moisture to correct both the soil water stores of the model and the satellite rainfall data. This novel dual-assimilation scheme is

based on the hypothesis that in areas with poor meteorological information, satellite soil moisture can inform about errors in satellite rainfall data, and if it is adequately processed, can improve the prediction of the catchment response to precipitation.

Camila's PhD forms part of the ARC project "Development of a new-generation flood forecasting system using observations from space", whose team members are recognised world leaders in surface water hydrology, environmental and hydrologic modelling, from BoM, CSIRO, USDA and the University of Melbourne.



### Alexandra Klados

Photo and biography not available.

## Treasurer's Report

The major activity of MSSANZ during the 2013-14 financial year was finalising the finance matters related to the MODSIM 2013 Congress held in Adelaide in December 2013. MSSANZ remains in a strong financial position in 2014. Given that 2013-14 was the harvesting year for MODSIM2013, a reasonable profit was made during the financial year, topped up by the interest gained from our 'sinking fund' term deposit and business online saver account.

Our largest expenditures in the 2013-14 financial year were expenses associated with the MODSIM 2015 congress, notably the deposit for the venue. The bulk of the expenses and income for MODSIM 2015 will occur in the 2014-15 financial year.

The financial statements continue to be audited on an annual basis by Canberra based firm Les Ellis and associates. Financial statements are available on request.

Please contact me via email ([s.elsawah@unsw.edu.au](mailto:s.elsawah@unsw.edu.au)) or telephone (0430303946) to obtain these statements or to discuss any aspect of the financial management of MSSANZ.

**Sondoss Elsawah**  
Treasurer, MSSANZ



## MEMBERS

The Society has more than 2,000 members from more than 50 countries, including Australia, Canada, China, France, Germany, Italy, Japan, New Zealand, the Netherlands, South Africa, Spain, Switzerland, Thailand, the United Kingdom and the United States. Members are from a wide range of professional disciplines including mathematics, hydrology, agricultural science, the various social sciences including economics, engineering, atmospheric science, geosciences, ecology, computer science and many others.

## Management Committee of MSSANZ Inc.

### President

*David Post*

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### Vice-President

*Michael McAleer*

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### Association Secretary

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### Treasurer

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## Newsletter Production

This newsletter has been produced by the MSSANZ Inc. Office at iCAM, The Australian National University. Clare Southerton has compiled the newsletter from material provided by David Post, Julia Piantadosi, John Boland, Tony Weber, Robert Anderssen, Malcolm McPhee, Sondoss Elsworth and award winners. Where the Society did not have photos or biographies of award winners, these were sourced from the web.

### MSSANZ Committee Members

Bob Anderssen

Robert Argent

Felix Chan

Amer Farhan Rafique

Malcolm McPhee

Julia Piantadosi

Carmel Pollino

Bellie Sivakumar

Tony Weber

Andre Zerger

### Awards Committee

Tony Jakeman (Chair)

Roger Braddock

Natashia Boland

Francis Chiew

Michael McAleer

Blair Nancarrow

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