2016 JOINT NZSA+ORSNZ CONFERENCE

NEW ZEALAND STATISTICAL ASSOCIATION
OPERATIONS RESEARCH SOCIETY OF NEW ZEALAND

CONFERENCE PROGRAMME

27th – 30th November 2016
Auckland University of Technology
New Zealand

AUT

Monday 09:20 – 10:20

MA WG403: Plenary 1

Statistics on Street Corners
Dianne Cook. Monash University, Australia.

Monday 10:40 – 12:25

MB WG403: Ordination

On comparing quantiles of models for count data
John Maindonald. Statistics Research Associates, New Zealand.

A goodness-of-fit test for the ordered stereotype model
*Daniel Fernandez[†] & **Ivy Liu**[‡]. [†]SUNY, University at Albany, USA; [‡]Victoria University of Wellington, New Zealand.*

Extending factor analysis to binomially distributed data
John Holmes. University of Otago, New Zealand.

Maximum likelihood estimation in constrained contingency tables with binary response.
Markus Stein. University of Auckland, New Zealand.

Should we give a damn? The role of data transformation/distance used in analysing count data
Katharina Parry. Massey University, New Zealand.

MB WG126: Stochastic Modelling 1

Delayed reporting of faults in warranty claims
***Richard Arnold**[†], Stefanka Chukova[†] & Yu Hayakawa[‡]. [†]Victoria University of Wellington, New Zealand; [‡]Waseda University, Japan.*

Strategic bidding in discrete accumulating priorities queue
***Raneetha Abeywickrama**[†], Moshe Haviv[‡] & Ilze Ziedins[†]. [†]University of Auckland, New Zealand; [‡]The Hebrew University of Jerusalem, Israel.*

A queueing model for nurse staffing in the Patient-At-Risk team and Intensive Care Unit
***Ali Haji Vahabzadeh** & Valery Pavlov. University of Auckland Business School, New Zealand.*

Hidden Markov models with discrete bivariate emissions.
***Rolf Turner**[†] & Jonathan Williams[‡]. [†]Department of Statistics, University of Auckland, New Zealand; [‡]Northland District Health Board, New Zealand.*

User equilibria in systems of processor sharing queues
***Niffe Hermansson**, Ilze Ziedins & Mark Holmes. University of Auckland, New Zealand.*

MB WA224: Mixture Models / MCMC

Markov chains for inferring true identity of individuals in a sample

Paula Bran, *Richard Barker & Matthew Schofield. University of Otago, New Zealand.*

One Step Two Step Big Step Small Step: A comparison of MCMC methods for non-identifiable models

Sarah Pirikahu, *Geoff Jones & Martin Hazelton. Massey University, New Zealand.*

Statistical principles on validating formative concepts: An annotated example

Ishani Soysa, *Nihal Jayamaha & Nigel Grigg. Massey University, New Zealand.*

Performance of Watanabe-Akaike Information Criterion (WAIC) and importance sampling methods in leave-one-out cross-validation approximation

M.A.C.S. Sampath Fernando, *James M. Curran & Renate Meyer. University of Auckland, New Zealand.*

MB WA220: YPP Session 1 / Energy

A new cost recovering, revenue adequate in expectation single settlement scheme for electricity markets

Ryan Cory-Wright, *Andy Philpott & Golbon Zakeri. Engineering Science, University of Auckland, New Zealand.*

Water behind capacity

Ellen Krohn Aasgard *& Pål Henrik Roti. Norwegian University of Science and Technology, Norway.*

Electricity contracts and price premia

Hamish Mellor *& Andy Philpott. University of Auckland, New Zealand.*

The impact of real world variation on the commercial optimisation application, pump scheduling

Cathy Daly. *SUEZ (Derceto Ltd.), New Zealand.*

Transmuted exponentiated modified Weibull distribution with an application to bladder cancer data

Muhammad Shuaib Khan, *Robert King & Irene Lena Hudson. The University of Newcastle, Callaghan, Australia.*

Monday 13:15 – 15:00

MC WG403: Spatio-temporal Modelling

Practically relevant academic programmes for training data scientists

Leo Paas. *Massey University, New Zealand.*

Spatio-temporal modelling of air quality using R-INLA

Nokuthaba Sibanda[†], *Munyaradzi Mujuru*[‡] *& Inos Dhau*[♯]. [†]*Victoria University of Wellington, New Zealand;* [‡]*Tshwane University of Technology, South Africa;* [♯]*University of Limpopo, South Africa.*

Statistical methods and considerations to model growth and clearance of malaria parasitemia in human challenge studies

Louise Marquart, *Leesa Wockner, Peter O'Rourke & James McCarthy. QIMR Berghofer Medical Research Institute, Australia.*

A spatio-temporal model for outbreak surveillance

Jonathan Marshall. *Massey University, New Zealand.*

Testing for changing patterns of spatial relative risk

Martin Hazelton. *Massey University, New Zealand.*

MC WG126: Statistical Theory 1

Contracted confidence intervals: a frequentist technique for greater efficiency when an existing estimate is sufficiently accurate

Robin Willink. Ministry of Business, Innovation and Employment, New Zealand.

Control charts scheme for high dimensional monitoring

Nurudeen Adegoke, Mat Pawley & Adam Smith. Massey University, New Zealand.

A functional central limit theorem on random fields for nested sampling domains

Leshun Xu, Alan Lee & Thomas Lumley. The University of Auckland, New Zealand.

Anisotrophic spatial modelling with Template Model Builder

Andrea Havron & Russell Millar. University of Auckland, New Zealand.

An improved two-stage approach for joint modelling of longitudinal and time-to-event data

Huong Thi Thu Pham & Nur Darfiana. Flinders University, Australia.

MC WA224: Bayesian Statistics

A Bayesian approach for parameter estimation in multi-stage models

Hoa Thi Thu Pham & Alan Branford. Flinders University, Australia.

Bayesian non-parametric spectral density estimation using B-spline priors

Matthew Edwards[†], Renate Meyer[†] & Nelson Christensen[‡]. [†]University of Auckland, New Zealand; [‡]Carleton College, USA.

Bayesian option pricing framework with stochastic volatility for FX data

Rachel Wang[†], Boris Choy[‡] & Hoi Ying Wong[†]. [†]The Chinese University of Hong Kong, Hong Kong; [‡]The University of Sydney, Australia.

DNest4: Diffusive nested sampling in C++ and Python

Brendon Brewer. Department of Statistics, University of Auckland, New Zealand.

Non-parametric Bayesian spectral density estimation of stationary time series using a generalized Whittle likelihood

Renate Meyer[†], Claudia Kirch[‡], Matthew Edwards[†] & Alexander Meier[‡]. [†]University of Auckland, New Zealand; [‡]University of Magdeburg, Germany.

MC WA220: YPP Session 2 / Transport

Risk-taking behaviour of public transport users

Chapa Jayalath[†], Anthony Downward[†] & Subeh Chowdhury[‡]. [†]Engineering Science, University of Auckland, New Zealand; [‡]Civil Engineering, University of Auckland, New Zealand.

Real-time prediction of bus arrival using joint models of vehicle and road states

Tom Elliott & Thomas Lumley. University of Auckland, New Zealand.

Mapping electric vehicle range

Danielle Gatland & Andrea Raith. Engineering Science, University of Auckland, New Zealand.

Modelling traceability in the dairy industry

Melissa Welsh. Victoria University of Wellington, New Zealand.

A solution technique for rostering in hospital departments

Thomas Adams, Michael O'Sullivan & Cameron Walker. Engineering Science, University of Auckland, New Zealand.

Monday 15:20 – 16:00

MD WG403: Software

The web browser as an R graphics device
Paul Murrell. Department of Statistics, University of Auckland, New Zealand.

DBSCAN clustering use in the electricity distribution network. VBA to R Package
Garry Julian. Powerco, New Zealand.

MD WG126: Stochastic Modelling 2

A new structural approach in modelling hazard rate with covariates
Budhi Arta Surya. School of Mathematics and Statistics, Victoria University of Wellington, New Zealand.

Markov processes: Dynamic visualizations to enhance student understanding
Maxine Pfannkuch & Stephanie Budgett. University of Auckland, New Zealand.

MD WA224: Transportation Modelling

Network aggregation with applications to evacuation planning
Bob Grün. University of Auckland, New Zealand.

Modelling fuel consumption in traffic assignment problems
Andrea Raith[†], Clemens Thielen[‡] & James Tidswell[†]. [†]Engineering Science, University of Auckland, New Zealand; [‡]Katholische Universität Eichstätt-Ingolstadt, Germany.

MD WA220: Dairy Modelling

POWDER: A strategic planning tool for New Zealand dairy farmers
Oscar Dowson, Andy Philpott, Andrew Mason & Anthony Downward. University of Auckland, New Zealand.

What happens in the container, stays in the container
Lisa Hall. Fonterra, New Zealand.

Monday 16:05 – 17:05

ME WG403: Data Journalism Panel

Data Journalism Panel
Harkanwal Singh (NZ Herald), Keith Ng (On Point), Lillian Grace (Figure.NZ) & Allan Lee (School of Communications, AUT)

Tuesday 09:00 – 10:00

TA WG403: Plenary 2

Analytics for understanding and improving health delivery services
Michael O'Sullivan. Engineering Science, University of Auckland, New Zealand.

Tuesday 10:20 – 12:05

TB WG403: Health Analytics 1

Can a brief telephone intervention for problem gambling impact on co-existing depression?

Nick Garrett, Maria Bellringer, Jussi Ranta & Max Abbott. Auckland University of Technology, New Zealand.

Risk adjusted statistical process control methods and their applications in simulations and a real-life case study of ED intubations

Christin Coomarasamy[†], Irene Zeng[‡], Andrew Brainard[♯] & Vanessa Thornton[♮]. [†]Auckland University of Technology, New Zealand; [‡]Counties Manukau Health, New Zealand; [♯]Emergency department, University of Auckland; Emergency Medicine, Counties Manukau Health, New Zealand; [♮]Emergency Medicine, Counties Manukau Health, New Zealand.

ART Adaptive Research Technologies

Ella Hodgson, Tasleem Hussein & Cliff Ashford. Information Communication Technologies Services, Auckland University of Technology , New Zealand.

Continuing professional development – what can NZSA do?

Ian Westbrooke[†], Nokuthaba Sibanda[‡] & Richard Penny[♯]. [†]NZ Department of Conservation, New Zealand; [‡]Victoria University of Wellington, New Zealand; [♯]Statistics New Zealand, New Zealand.

TB WG126: Genetics

Density approximation in population genetics

Wei Zhang[†], Jing Liu[‡], Jesse Goodman[†] & Rachel Fewster[†]. [†]Department of Statistics, University of Auckland, New Zealand; [‡]Shanghai Jiao Tong University, China.

Disease module detection (via graph clustering)

Matthieu Vignes. Massey University, New Zealand.

Bayes meets baby poo: Bayesian estimation of infant gut microbial diversity using Metagenomic data

Roy Costilla, Ivy Liu & Richard Arnold. Victoria University of Wellington, New Zealand.

Estimation of quantitative genetics parameters in partially-genotyped populations

Alastair Lamont. University of Otago, New Zealand.

Parentage identification in New Zealand farmed deer using genotyping-by-sequencing

Ken Dodds, Suzanne Rowe, John McEwan, Tracey van Stijn, Rudiger Brauning & Shannon Clarke. AgResearch, New Zealand.

TB WA224: Demography

Dynamics of global remittances: a graph-based analysis

Felipe Lillo, Leidy García & Valentín Santander. UCM, Chile.

Redeveloping the confidentiality method for Statistics New Zealand business demography data

Alistair Ramsden & Caleb Moses. Statistics New Zealand, New Zealand.

Dynamic chloropeths for poverty mapping

Geoff Jones. Massey University, New Zealand.

Tree-based methods for poverty mapping

Penelope Bilton[†], Geoff Jones[‡], Ganesh Siva[♯] & Steve Haslett[♮]. [†]Institute of Fundamental Sciences, New Zealand; [‡]Massey University, New Zealand; [♯]AgResearch, New Zealand; [♮]Massey University / ANU, New Zealand.

Spatially balanced sampling for socio-economic surveys

Naeimeh Abi. University of Canterbury, New Zealand.

TB WA220: Combinatorial Optimisation

Finding Sources of flexibility within tightly constrained operating room resources to reduce the impact of acute surgeries on elective surgery schedules

Daniel Cheng. University of Auckland, New Zealand.

Dynamic ambulance redeployment

Samuel Ridler, Andrew Mason & Andrea Raith. Engineering Science, University of Auckland, New Zealand.

Binary optimisation models for computing the frustration index in signed graphs

*Samin Aref[†], Andrew Mason[‡] & **Mark C. Wilson**[♯]. [†]University of Auckland, New Zealand; [‡]Engineering Science, University of Auckland, New Zealand; [♯]Computer Science, University of Auckland, New Zealand.*

A liability allocation game

Robin Hankin. Auckland University of Technology, New Zealand.

Tuesday 12:55 – 13:55

TC WG403: Health Analytics 2

An application of mediation analysis to randomised control trial data

***Janet Pearson**[†], Alain Vandal[‡] & Ema Tokolahi[†]. [†]Auckland University of Technology, New Zealand; [‡]Department of Biostatistics and Epidemiology, Auckland University of Technology, Auckland and Health Intelligence and Informatics, Ko Awatea, Counties Manukau Health, New Zealand.*

Feasibility study: Insulin therapy for diabetic foot ulcers

***Diane Park**. Auckland University of Technology, New Zealand.*

Clinical decision rule development: a case study

*Steve White, **Alain Vandal**, Peter McNair & Mark Laslett. Auckland University of Technology, New Zealand.*

TC WG126: Generalised Linear Models

Focused model averaging in generalized linear models

***Chuen Yen Hong**, David Fletcher & Matthew Parry. University of Otago, New Zealand.*

A set of novel link functions for modeling the mean of heavy-tailed distributions under the VGLM/VGAM approach

***Victor Miranda Soberanis** & Thomas Yee. Department of Statistics, University of Auckland, New Zealand.*

Parametric Bootstrap and Power Analysis for GLMMs

***Peter Green**. The Agribusiness Group / Landcare Research, New Zealand.*

TC WA224: Multicriteria Optimisation

Parallel Implementation of a Multi-objective Linear Programming Solver

***Mihai Bostan** & Andrea Raith. Engineering Science, University of Auckland, New Zealand.*

Knowledge-guided heuristics for radiotherapy treatment plan optimisation

***Lisa Hillas** & Andrea Raith. Engineering Science, University of Auckland, New Zealand.*

Multi-objective navigation of external radiotherapy treatment plans using clinical criteria

***Kuan-Min Lin**[†] & Matthias Ehrgott[‡]. [†]University of Auckland, New Zealand; [‡]Lancaster University, United Kingdom.*

TC WA220: Census Collection / Networks

Ex ante measures of Census key performance indicators

John Crequer. Statistics New Zealand, New Zealand.

Optimisation for the 2018 Census

Andrew Mason[†], John Crequer[‡], Geoff Leyland[♯], Isaac Cleland[†] & Thomas Adams[†]. [†]University of Auckland, New Zealand; [‡]Statistics NZ, New Zealand; [♯]Incremental, New Zealand.

Survivable electricity distribution network design using batteries

Ruth Dominguez Martin[†] & Andy Philpott[‡]. [†]University of Castilla-La Mancha, Spain; [‡]University of Auckland, New Zealand.

Tuesday 14:00 – 15:00

TD WG403: Plenary 3

Precision Health – New Zealand's golden analytics opportunity

Kevin Ross. Orion Health, New Zealand.

Tuesday 15:20 – 16:00

TE WG403: Health Economics

An econometric analysis of the Patient-At-Risk team and Intensive Care Unit

Ali Haji Vahabzadeh & Valery Pavlov. University of Auckland Business School, New Zealand.

Cost of traumatic brain injury in New Zealand: What can we learn from cost-of-illness studies?

Braden Te Ao. Auckland University of Technology, New Zealand.

TE WG128: Poster Session

Spatially adaptive kernel density estimation: Exploring global bandwidth selection techniques

Tilman Davies[†], Martin Hazelton[‡] & Claire Flynn[♯]. [†]University of Otago, New Zealand; [‡]Massey University, New Zealand; [♯]MetService NZ, New Zealand.

Shewhart, EWMA and CUSUM charts for monitoring fractional non-conformance in short-run production process

Xin Zhou, Kondaswamy Govindaraju & Geoff Jones. Massey University, New Zealand.

Bayesian non-parametric approaches to multivariate time series analysis

Alexander Meier[†], Renate Meyer[‡], Claudia Kirch[†] & Matthew Edwards[‡]. [†]OvGU Magdeburg, Germany; [‡]University of Auckland, New Zealand.

Determining the probability distribution of earthquake forecasts

David Harte. GNS Science, New Zealand.

Expectation-maximization of baby poo: Frequentist estimation of infant gut microbial diversity using Metagenomic data

Roy Costilla, Ivy Liu & Richard Arnold. Victoria University of Wellington, New Zealand.

Modelling risk in multistage stochastic programming problems

Regan Baucke, Anthony Downward & Golbon Zakeri. Engineering Science, University of Auckland, New Zealand.

TE WA220: Electricity Markets 1

Co-optimization of energy and reserve for a strategic major consumer in New Zealand electricity market

Mahbubeh Habibian, Golbon Zakeri & Anthony Downward. University of Auckland, New Zealand.

Electricity offer strategy with constrained transmission

Keith Ruddell, Anthony Downward & Andy Philpott. Engineering Science, University of Auckland, New Zealand.

Tuesday 16:05 – 17:05

TF WG403: Plenary 4

Translational research in the data sciences

Rhema Vaithianathan. Auckland University of Technology, New Zealand.

Wednesday 09:00 – 10:20

WA WG403: Environment / Biodiversity

Model selection and parameter inference in phylogenetics using Nested Sampling.

Patricio Maturana. University of Auckland, New Zealand.

Hierarchical modelling of occupancy and indices of abundance for New Zealand national biodiversity monitoring data

Paul van Dam-Bates[†] & Andrew Gormley[‡]. [†]Department of Conservation, New Zealand; [‡]Landcare Research, New Zealand.

Modeling environmental gradients in species composition using multivariate spatial factor analysis.

Russell Millar. University of Auckland, New Zealand.

Wasp population dynamics in their native and invaded ranges: plus ca change...

John Haywood & Phil Lester. Victoria University of Wellington, New Zealand.

WA WG126: Statistical Theory 2

Optimal design measures via nonlinear optimization under asymmetric errors and second-order least squares estimation

Rahul Mukherjee[†] & S Huda[‡]. [†]Indian Institute of Management Calcutta, India; [‡]Kuwait University, Kuwait.

EM algorithm and stochastic control

Steven Kou[†], Xianhua Peng[‡] & Xingbo Xu[♯]. [†]National University of Singapore, Singapore; [‡]Hong Kong University of Science and Technology, Hong Kong; [♯]Goodman Sachs, USA.

Computation of adaptive kernel intensity estimates of planar point process data

Tilman Davies[†] & Adrian Baddeley[‡]. [†]University of Otago, New Zealand; [‡]Curtin University, Australia.

Hybrid estimators for a general class of estimation problems

Mehdi Soleymani[†] & Stephen Lee[‡]. [†]University of Auckland, New Zealand; [‡]University of Hong Kong, Hong Kong.

WA WA220: Electricity Markets 2

Forward contracting in markets with private information

Andy Philpott[†] & Eddie Anderson[‡]. [†]University of Auckland, New Zealand; [‡]University of Sydney, Australia.

Risk averse equilibrium in electricity market

Henri Gerard[†‡], Andy Philpott[†] & Vincent Leclère[‡]. [†]EPOC, University of Auckland, New Zealand; [‡]CERMICS, France.

Identification of precursor patterns for prediction of frequency fluctuations in electrical power generation data

Md.Shahidul Islam, Russel Pears & Boris Bacic. School of Engineering, Computer and Mathematical Sciences, Auckland University of Technology, New Zealand.

Wednesday 10:40 – 12:00

WB WG403: Performance Measures

A new metric for scale elasticity in Data Envelopment Analysis

Maryam Hasannasab, Israfil Roshdi, Dimitris Margaritis & Paul Rouse. Accounting and Finance, University of Auckland, New Zealand.

Advanced monitoring of project performance data

Amir Salehipour[†] & Leila Moslemi Naeni[‡]. [†]University of Newcastle, Australia; [‡]University of Technology Sydney, Australia.

Service level agreement between a supplier and multiple customers

Babak Abbasi[†], Zahra Hosseinifard[‡], Osama Alamri[†], Doug Thomas[♯] & James Minas[♮]. [†]RMIT University, Australia; [‡]Deakin University, Australia; [♯]Penn State University, USA; [♮]SUNY New Paltz University, USA.

Supply chain bottlenecks and their applications on flexible planning

Samin Aref[†] & Iman Kazemian[‡]. [†]University of Auckland, New Zealand; [‡]University of Tehran, Iran.

WB WG126: Bayesian Statistics 2

Two principles for checking Bayesian methodologies

Robin Willink. Ministry of Business, Innovation and Employment, New Zealand.

Modelling temporal dependence of bivariate survival data using copulas

Jose Romeo[†] & Renate Meyer[‡]. [†]Massey University, New Zealand; [‡]University of Auckland, New Zealand.

R-like pseudocode for fitting mixtures of distributions

Murray Jorgensen. Auckland University of Technology, New Zealand.

Reference prior for Gaussian mixture models

Kate Lee. Auckland University of Technology, New Zealand.

WB WA224: Model Selection

Using mixture prior distributions to understand Bayes factors
Matthew Schofield & Richard Barker. University of Otago, New Zealand.

Using APC (All Possible Comparison) criterion for the analysis of non-orthogonal screening designs
Abu Zar Md. Shafiullah & Arden Miller. University of Auckland, New Zealand.

The accuracy of the APC method of model selection for different types of error control
Arden Miller & Abu Zar Md. Shafiullah. University of Auckland, New Zealand.

WB WA220: Tourism Analytics

On proportional odds modelling and marginal effects of Sardinian hotels data
Thomas Yee[†], Giulia Contu[‡] & Claudio Conversano[‡]. [†]University of Auckland, New Zealand; [‡]University of Cagliari, Italy.

Tourism analytics: a recommendation engine for itinerary planning
Anthony Downward[†], Subeh Chowdhury[‡] & Cengyue Chen[†]. [†]Department of Engineering Science, University of Auckland, New Zealand; [‡]Department of Civil Engineering, University of Auckland, New Zealand.

Developing forecasts for New Zealand of regional spend by international tourists
Raphael Aggio, Michael Webster & Peter Ellis. Ministry of Business, Innovation and Employment, New Zealand.

Wednesday 13:00 – 14:00

WC WG403: Plenary 5

Optimizing Prioritized and Nested Solutions
David Morton. Northwestern University, USA.

AUTHOR INDEX