



# 38th International Workshop on Statistical Modelling

14 to 19 July 2024 Durham City, UK

# Programme



## Welcome to IWSM 2024

#### Dear Delegates,

It is a huge pleasure to host the 38th International Workshop on Statistical Modelling in Durham. The conference is attended by more than 130 delegates from about 20 countries, who, between them, will present about 100 papers to the audience, in form of oral or poster presentations.

This is the 4th time that this conference resides in the UK, following Exeter (1994), Glasgow (2010), and Bristol (2018). As you will have realized on your way to the conference venue, Durham is pretty far up in the North of England, and indeed there have been frequent interactions with Scotland over the centuries — some of which you will have opportunity to get some insight into when we visit Auckland Castle in one of the excursions on Wednesday.

The community which annually finds its way to the IWSM conferences is a quite extraordinary one — it is a friendly, welcoming, open community (albeit still driven by a rather specific vision of contemporary statistical science), which puts particular emphasis on the integration and support of postgraduate students. Indeed, it is quite remarkable that, among the 56 contributed oral presentations at this conference, 31 are delivered by postgraduate students. As some way to honour their contributions, the workshop will once more provide prizes for the best student oral presentation, poster, and paper. The Statistical Modelling Society has furthermore contributed two overseas travel awards for presenting PhD students, and the Durham Research Methods Centre two Durham summer grants to facilitate attendance of the short course.

A particular thank goes to the Scientific Committee, who took up their roles soon after the Trieste meeting in 2022, and have closely worked with the Organizers since then. The work of the SC included suggesting and selecting invited speakers, reviewing submissions to the conference (all contributions got reviewed in the same way, whether oral or poster, and whether student or non-student), and, even during this meeting, the scoring of the student prizes.

We are also particularly looking forward to the presentations by the invited speakers, Dimitris Rizopoulos (Erasmus MC Rotterdam), Robin Henderson (Newcastle University), Fiona Steele (University College London), Maria Kateri (RWTH Aachen), and Ernst Wit (Lugano), who will cover a range of exciting topics in their talks, touching the boundaries of the state of current knowledge in their fields. In addition, Emanuele Giorgi (Lancaster) is delivering a short course on model-based geostatistics for Public Health.

Arriving into Durham on the eve of the workshop, one can't help noting that the sentiment appears familiar – a long summer night with omnipresent screens displaying the football finals. Surely this will result in some more, and some less, smiling faces in the audience in the early sessions of the conference on Monday! But certainly, the science will take over soon, and we we will be engaged in a week of stimulating exchanges on new developments and advances in statistical modelling.

For further information please visit IWSM 2024: https://maths.dur.ac.uk/iwsm2024/ Statistical Modelling Society: https://www.statmod.org Durham University: https://www.durham.ac.uk/ This is Durham: https://www.thisisdurham.com/



## Scientific Committee

Elisabeth Bergherr, University of Göttingen (Germany) Kevin Burke, University of Limerick (Ireland) Enrico Colosimo, Federal University of Minas Gerais (Brazil) Riccardo de Bin, University of Oslo (Norway) Reza Drikvandi (Co-Chair), Durham University (UK) Jochen Einbeck (Chair), Durham University (UK) Andreas Groll, TU Dortmund University (Germany) Marco Grzegorczyk, University of Groningen (The Netherlands) Kenan Matawie, Western University Sydney (Australia) Helen Ogden, University of Southampton (UK) Konstantinos Perrakis (Co-Chair), University of Durham (UK) Pere Puig, Universitat Autònoma de Barcelona (Spain) Rosalba Radice, Bayes Business School (UK) Javier Rubio, University College London (UK) Cibele M Russo, Universidade de São Paulo (Brazil) Jeff Simonoff, Leonard N. Stern School of Business (US) Claudia Tarantola, University of Pavia (Italy) Veronica Vinciotti, University of Trento (Italy)

## **Organising Committee**

Hosts: Jochen Einbeck, Reza Drikvandi, Hyeyoung Maeng, Konstantinos Perrakis

Local organizing committee members: Tahani Coolen-Maturi, Jonathan Cumming, Andy Golightly, Sam Jackson, Georgios Karagiannis, Zhaocheng Li, James Liley, Emmanuel Ogundimu, Rachel Oughton, Adam Stone, Germaine Uwimpuhwe, Qing Zhang, Yingjuan Zhang

*External organizing committee members*: Paul Wilson (Wolverhampton, UK), Pete Philipson (Newcastle, UK), Kevin Burke (Limerick, Ireland), Bruce Worton (Edinburgh, UK), Giampiero Marra (UCL, UK)

## Main conference venues

Short course: Calman Learning Centre, CLC 406

**Registration:** Entrance of Calman Learning Centre

All presentations: The Sir Ken Wolfendale lecture theatre (CLC013), ground floor in the Calman Centre

Coffee breaks: Calman Centre penthouse rooms (CLC 406 and CLC 407)

Welcome Reception: Hatfield College Hall (on Durham peninsula)

Poster session: Calman Centre penthouse rooms (CLC 406 and CLC 407)

Lunch on Monday, Tuesday, and Thursday: In Grey College.

Lunch on Wednesday and Friday: Calman Centre penthouse rooms (CLC 406 and CLC 407)

Conference dinner: Ushaw: Historic Hourse, Chapels and Gardens

SMS EC and Journal meetings: Calman Centre penthouse rooms (CLC 407)

## Schedule

Sunday 14	Monday 15	Tuesday 16	Wednesday 17	Thursday 18	Friday 19
	Registration				
Registration	8:15-9:15	Registration 8:30-8:50			
9:00-9:30		<b>Contributed Session 5</b>	Contributed Session 9	Contributed Session 11	
	Opening 9:15 - 9:30	08:50-10:10	08:50-10:10	08:50-10:10	Contributed Session 15
Short Course	<b>Contributed Session 1</b>				09:00-10:20
9:30-11:00*	9:30-10:30				
		Coffee Break	Coffee Break	Coffee Break	
	Coffee Break	10:10- 10:40	10:10- 10:40	10:10-10:40	Coffee Break
Coffee Break	10:30-11:00	Invited speaker	Invited speaker	Invited speaker	10:20-10:50
11:00- 11:30*	Invited speaker	Fiona Steele	Maria Kateri	Robin Henderson	Invited speaker
Short Course	Dimtris Rizopoulos	10:40-11:40	10:40-11:40	10:40-11:40	Ernst Wit
11:30-12:30	11:00-12:00	<b>Contributed Session 6</b>	Contributed Session 10	<b>Contributed Session 12</b>	10:50-11:50
	<b>Contributed Session 2</b>	11:40-12:40	11:40-13:00	11:40-12:20	Contributed Session 16
Lunch	12:00-13:00			AGM	11:50-13:10
12:30-13:30		Lunch		12:20-13:10	
	Lunch	12:40-14:10	Lunch	Lunch	
Short Course	13:00-14:30		13:00-14:00	13:10-14:30	Closing and Lunch
13:30-15:00		<b>Contributed Session 7</b>			13:10-14:30
	Contributed Session 3 14:30-15:30	14:10-15:10	Excursion Buses from 14:00	Contributed Session 13 14:30-15:50	
Coffee Break		Coffee Break			
15:00- 15:30*	Coffee Break	and			
Short Course	15:30- 16:00	Poster Session		Coffee Break	
15:30-17:00*	Contributed Session 4 16:00-17:20	15:10-17:00		15:50-16:20 Contributed Session 14	
				16:20-17:20	
*workshop registration		<b>Contributed Session 8</b>			
is open at these times		17:00-18:20			
Informal get-together incl Euro final - from 10:00	Welcome Reception		Riteas raturn at 10:30	Conference Dinner Buses from 18·30	
in Grey College bar				Buses return at 22:30	

#### **Oral Presentations**<sup>1</sup>

Monday, 15th of July

#### 08:15 - 09:15 Registration

#### 09:15 - 09:30 Opening

Jochen Einbeck

09:30 - 10:30	Contributed Session 1	chair: Vito Muggeo
09:30 - 09:50	<u>Colin Griesbach</u> , Elisabeth Bergherr Additive mixed models for location, scale and shape	via gradient boosting
	techniques	
09:50 - 10:10	<u>Annika Strömer<sup>S</sup></u> , Nadja Klein, Andreas Mayr	
	A model-based boosting approach to deal with dependen	nt censoring
10:10 - 10:30	<u>Guillermo Briseño Sanchez</u> <sup>S</sup> , Nadja Klein, Andreas May	r, Andreas Groll
	Boosting distributional copula regression for bivariate tin	me-to-event data

#### 10:30 - 11:00 Coffee Break

#### 11:00 - 12:00 Invited Speaker

Dimitris Rizopoulos, Jeremy M.G. Taylor Dynamic predictions from joint models using super learning

#### 12:00 - 13:00 Contributed Session 2

 12:00 - 12:20 <u>Nirian Martín</u>, Miguel Marín Uncorrelatedness in high-dimension: hypothesis testing of independence in presence of outliers
 12:20 - 12:40 <u>Roman Parzer<sup>S</sup></u>, Peter Filzmoser, Laura Vana-Gür Random projections for classification with high-dimensional data
 12:40 - 13:00 <u>Vanda Inácio</u>, Richard A Parker Induced robust inference for the concordance correlation coefficient

13:00 - 14:30 Lunch (Grey College)

#### 14:30 - 15:30 Contributed Session 3

chair: Elisabeth Bergherr

chair: Konstantinos Perrakis

chair: Riccardo de Bin

14.30 - 14.50	Andrea Panarotto <sup>S</sup> Manuela Cattelan, Buggero Bellio
11.00 11.00	<u>Andrea Fanarotto</u> , Manaela Catterian, Ruggero Denio
	State-space models for clustering of compositional trajectories
14:50 - 15:10	<u>Timo Adam</u> , Mads Peter Heide-Jørgensen, Susanne Ditlevsen
	Modelling narwhal diving behaviour and responses to sound exposure using
	stochastic differential equations with state-switching coefficients
15:10 - 15:30	<u>David O'Sullivan</u> , Caroline Pena, Alina Dubovskaya
	A mathematically tractable model for information diffusion between
	communities

<sup>&</sup>lt;sup>1</sup>Speakers are underlined, the <sup>S</sup> symbol denotes speakers who enlisted for student awards

#### 15:30 - 16:00 Coffee Break

16:00 - 17:20	Contributed Session 4	chair: Marco Grzegorczyk
16:00 - 16:20	Daniele Tancini, <u>Francesco Bartolucci</u> , Silvia Pando	olfi
	Bayesian hidden Markov models for early warning	
16:20 - 16:40	Jan-Ole Koslik, Carlina C. Feldmann, Sina Mews,	<u>Rouven Michels<sup>S</sup>,</u> Roland
	Langrock	
	Inferential tools for hidden Markov models with pe	riodic components
16:40 - 17:00	Fernando Miguelez <sup>S</sup> , Josu Doncel, Maria Dolores U	Igarte
	Multivariate forecasting of operational times using	hidden Markov models
17:00 - 17:20	<u>Ruta Juozaitienė</u> <sup>S</sup> , Ernst Wit	
	Misleading effects in relational event models	
18:30	Welcome Reception at Hatfield College	

#### 08:50 - 10:10 Contributed Session 5

chair: John Hinde

08:50 - 09:10	João Flavio da Silva <sup>S</sup> , Rafael Izbicki, Leonardo S. Bastos, Guilherme P. Soares
	Monitoring viral infections in severe acute respiratory syndrome patients in
	Brazil
09:10 - 09:30	<u>Gillian Heller</u> , Andrew Forbes, Stephane Heritier
	Statistical models for patient-centered outcomes in clinical studies
09:30 - 09:50	<u>Pedro Afonso<sup>S</sup></u> , Dimitris Rizopoulos, Rhonda Szczesniak, Eleni-Rosalina
	Andrinopoulou
	A joint model for multiple (un)bounded longitudinal markers, competing risks,
	and recurrent events
09:50 - 10:10	<u>Rita Fici<sup>S</sup></u> , Luigi Augugliaro, Ernst Wit
	Functional Gaussian graphical regression model for analysing brain-body
	rhythm

#### 10:10 - 10:40 Coffee Break

#### 10:40 - 11:40 Invited Speaker

chair: Reza Drikvandi

chair: Jutta Gampe

chair: Pere Puig

<u>Fiona Steele</u>, Siliang Zhang, Paul Clarke Modelling correlations among grouped random effects in multilevel models with an application to the estimation of household effects on longitudinal health outcomes

#### 11:40 - 12:40 Contributed Session 6

11:40 - 12:00 <u>Lea Kaufmann<sup>S</sup></u>, Maria Kateri Likelihood ratio tests in penalized logistic regression with categorical co-variates
12:00 - 12:20 <u>Robert Bajons<sup>S</sup></u>, Kurt Hornik Adaptive generalized logistic lasso and its application to rankings in sports
12:20 - 12:40 <u>Dayasri Ravi<sup>S</sup></u>, Andreas Groll Optimizing variable selection in multi-omics datasets: a focus on exclusive lasso

#### 12:40 - 14:10 Lunch (Grey College)

#### 14:10 - 15:10 Contributed Session 7

14:10 - 14:30	Darshana Jayakumari <sup>S</sup> , Jochen Einbeck, John Hinde, Rafael Moral
	A distance-based statistic for goodness-of-fit assessment
14:30 - 14:50	<u>Matteo Framba<sup>S</sup></u> , Veronica Vinciotti, Ernst Wit
	Inference for quasi-reaction models with covariate-dependent rates
1450 1510	$\mathbf{H}_{\mathbf{r}} \rightarrow \mathbf{L} \mathbf{K}^{\dagger} = \mathbf{L} \mathbf{L} \rightarrow \mathbf{N}_{\mathbf{r}} = \mathbf{C} + \mathbf{M}_{\mathbf{r}} + \mathbf{C} + \mathbf{L} + \mathbf{C} + \mathbf{C} + \mathbf{C}$

14:50 - 15:10 <u>Hannah Klinkhammer<sup>S</sup></u>, Andreas Mayr, Carlo Maj, Peter Krawitz, Christian Staerk

Anchor regression to enhance transferability of genetic prediction models

#### 15:10 - 17:00 Coffee Break and Poster session

17:00 - 18:20	Contributed Session 8	chair: Arnošt Komárek
17:00 - 17:20	<u>Martina Boschi<sup>S</sup></u> , Ernst Wit	
	Relational event additive modeling of alien plant and	insect species invasions
17:20 - 17:40	Lars Knieper <sup>S</sup> , Thomas Kneib, Elisabeth Bergherr	
	Spatial confounding in gradient boosting	
17:40 - 18:00	Arantxa Urdangarin <sup>S</sup> , Tomás Goicoa, María Dolores	Ugarte
	Mitigating spatial confounding: a unified approach int	egrating simplified
	spatial+ and restricted regression	
18:00 - 18:20	Weiyue Zheng <sup>S</sup> , Andrew Elliott, Claire Miller, Marian	1 Scott
	Spatial regression with misaligned covariates for soil n	noisture mapping

## Wednesday, 17th of July

#### 08:50 - 10:10 Contributed Session 9

chair: Sabine Schnabel

08:50 - 09:10	Nikolai Spuck <sup>S</sup> , Matthias Schmid, Moritz Berger
	Confidence intervals for tree-structured varying coefficients based on parametric
	bootstrap
09:10 - 09:30	Quentin Seifert <sup>S</sup> , Elisabeth Bergherr, Tobias Hepp
	Function-on-scalar regression via first-order gradient-based optimization
09:30 - 09:50	<u>Paul Eilers</u> , Martin Boer
	Derivatives of the log of a determinant
09:50 - 10:10	<u>Daniel Racek<sup>S</sup></u> , Paul Thurner, Göran Kauermann
	Non-parametric smoothing for the diffusion of armed conflict

#### 10:10 - 10:40 Coffee Break

#### 10:40 - 11:40 Invited Speaker

chair: Tahani Coolen-Maturi

<u>Maria Kateri</u> Statistical modelling through the lens of divergence measures

#### 11:40 - 13:00 Contributed Session 10

chair: Andreas Groll

11:40 - 12:00	<u>Claudia Collarin<sup>S</sup></u> , Matteo Fasiolo
	Integrating single index effects in generalized additive models
12:00 - 12:20	<u>Léa Orsini<sup>S</sup>, Emmanuel Lesaffre, Guosheng Yin, Caroline Brard, David</u>
	Dejardin, Gwénaël Le Teuff
	Bayesian analysis of restricted mean survival time adjusted on covariates using
	pseudo-observations
12:20 - 12:40	<u>Dalila Failli<sup>S</sup></u> , Bruno Arpino, Maria Francesca Marino, Francesca Martella
	A biclustering approach via mixture of latent trait analyzers for the analysis
	of digital divide in Italy
12:40 - 13:00	Samyajoy Pal <sup>S</sup> , Christian Heumann
	Gene coexpression analysis with Dirichlet mixture model: accelerating
	model evaluation through closed-form KL divergence approximation
	using variational techniques

#### 13:00 - 14:00 Lunch (Calman Centre)

#### 14:00 Excursion

#### 08:50 - 10:10 Contributed Session 11

chair: Gillian Heller

08:50 - 09:10	Moritz Berger, Maria Iannario
	Penalized mixed cumulative regression for modelling varying dispersion and
	cluster heterogeneity
09:10 - 09:30	Mabel Morales-Otero, <u>Vicente Nuñez-Anton</u>
	Bayesian approaches to model overdispersion in spatio-temporal binomial data
09:30 - 09:50	<u>Lorenzo Mori<sup>S</sup></u> , Maria Rosaria Ferrante
	Addressing covariate lack in unit-level small area models using GAMLSS
09:50 - 10:10	<u>Luisa Ferrari<sup>S</sup></u> , Massimo Ventrucci
	Variance partitioning-based priors for species distribution models

#### 10:10 - 10:40 Coffee Break

#### 10:40 - 11:40 Invited Speaker

<u>Robin Henderson</u> Statistical modelling for big and little data

#### 11:40 - 12:20 Contributed Session 12

chair: Massimo Ventrucci

chair: Kevin Burke

- 11:40 12:00 <u>Roman Pfeiler<sup>S</sup></u>, Helga Wagner Shrinkage in a Bayesian random intercept model with time-varying coefficients
  12:00 - 12:20 <u>Ilse Cuevas Andrade<sup>S</sup></u>, Ardo van den Hout, Nora Pashayan
  - Non-parametric frailty model for the natural history of prostate cancer; using data from a screening trial

#### 12:20 - 13:10 Annual General Meeting

Helga Wagner Chair of the Statistical Modelling Society Andreas Mayr The Statistical Modelling Journal Kevin Burke Announcement of the 39th IWSM 2025

13:10 - 14:30 Lunch (Grey College)

#### 14:30 - 15:50 Contributed Session 13

chair: Helmut Küchenhoff

14:30 - 14:50	Marco Grzegorczyk
	Bayesian networks for ordinal variables
14:50 - 15:10	<u>Melania Lembo</u> , Ruta Juozaitienė, Veronica Vinciotti, Ernst Wit,
	Context matters: including global covariates in relational event models
15:10 - 15:30	<u>Michele Lambardi di San Miniato</u> , M. Battauz, Ruggero Bellio, P. Vidoni
	Bayesian ordinal regression for crowed-sourced fact-checking
15:30 - 15:50	Vito Muggeo, Gianluca Sottile
	Segmented quantile regression process with $\tau$ -varying breakpoints

15:50 - 16:20 Coffee Break

### 16:20 - 17:20 Contributed Session 14

chair: Emmanuel Ogundimu

16:20 - 16:40	Tathagata Basu
	Regression analysis with missing data using interval imputation
16:40 - 17:00	Anabel Blasco-Moreno, Pedro Puig
	Estimating a lower bound of the population size in capture-recapture
	experiments with right censored data
17:00 - 17:20	Shirin Moghaddam, John Newell, John Hinde
	Parametric and non-parametric Bayesian imputation for right censored
	survival data
19:00	Conference Dinner at Ushaw (Buses from 18:30)

## Friday, 19th of July

09:00 - 10:20	Contributed Session 15	chair: Jeff Simonoff
09:00 - 09:20	Miguel de Carvalho, Vianey Palacios Ramirez	
	Nonparametric Bayesian modeling of nonstationary joint	t extremes
09:20 - 09:40	Vincenzo Gioia, Di Credico Gioia, Pauli Francesco	
	A Bayesian Markov-switching for smooth modelling of e	xtreme value
	distributions	
09:40 - 10:00	Martin Boer	
	REML for two-dimensional P-splines	
10:00 - 10:20	Oskar Laverny, Nathalie Grafféo, Roch Giorgi	
	Non-parametric estimation of net survival under depend	ence between death
	causes	

#### $10{:}20$ - $10{:}50$ Coffee Break

#### 10:50 - 11:50 Invited Speaker

chair: Helga Wagner

 $\frac{\rm Ernst~Wit}{\rm Advances~in~modelling~dynamic~networks}$ 

11:50 - 13:10	Contributed Session 16	chair: Vicente Nuñez-Antón
11:50 - 12:10	Joaquin Cavieres, Cole Monnahan, David Bolin, Elisabeth Bergherr Approximated Gaussian random fields under different parametrizations for MCMC	
12:10 - 12:30	Alexey Koloydenko, Ioan Notingher, Radu Boito Shape analysis of AF segments for rapid assessm presence by AF-Raman microscopy	r, Jüri Lember ent of Mohs layers for BCC
12:30 - 12:50	Rui Martins An underrated prior distribution for proportions. dynamical football predictions	. The logistic–normal for
12:50 - 13:10	<u>Kevin Burke</u> , James Gleeson, Mike Quayle Modelling social interaction data	

#### 13:10 - 14:30 Closing & Lunch

Helga Wagner, Jochen Einbeck, Kevin Burke

#### **Poster Presentations**

Tuesday, 16th of July, 15:10 - 17:00

- 1. <u>Víctor Alonso-Lara</u>, Amanda Fernández-Fontelo, Pere Toran, Meritxell Gómez-Maldonado, Gemma Falguera, David Moriña. Statistical detection of barriers in primary care access for young victims of gender-based violence
- 2. <u>Sébastien Appleby<sup>S</sup></u>, George Iosifidis, Arthur White. Empirical study of the Sardex network
- 3. <u>Ina-Marie Berendes<sup>S</sup></u>, Alexander Gerharz, Andreas Groll, Mathias Kolodziej. Modeling and predicting injuries in soccer with machine learning and conventional statistical approaches
- 4. <u>Herlisson Bezerra<sup>S</sup></u>, Luis F. B. de Messis, Cibele Russo, Thomas Peron. A comparison of methods for oil production forecasting of the Santos Basin
- 5. <u>Yilun Cai<sup>S</sup></u>, Jochen Einbeck, Stephen Barnard, Elizabeth Ainsbury. Estimating dose and time of exposure from a protein-based radiation biomarker
- 6. <u>Angela Carollo</u>, Nicole Hiekel, Valeria Ferraretto. A boosted multistate model of partnership trajectories in Germany
- 7. Davide Di Cecco, <u>Andrea Tancredi</u>. Species sampling with misidentification: a Bayesian parametric approach
- 8. Tahani Coolen-Maturi. Combining biomarkers through PCA
- 9. <u>Ultán P. Doherty<sup>S</sup></u>, Rachel McLoughlin, Tracey Claxton, Arthur White. gateTree: A userinformed tree algorithm for population identification in flow cytometry
- 10. <u>Cristina Galán-Arcicollar<sup>S</sup></u>, Danilo Alvares, Josu Najera-Zuloaga, Dae-Jin Lee. A joint modelling approach for longitudinal patient-reported outcomes and survival analysis
- 11. <u>Jacob Grytzka<sup>S</sup></u>, Andreas Groll. Statistical modeling of UEFA EURO soccer matches with focus on player market value and other hybrid variables
- 12. <u>John Hinde</u>, Alberto Alvarez-Iglesias, John Ferguson, Clarice G.B. Demétrio, John Crown, Bryan T. Hennessy, Vicky Donachie. Modelling of overdispersed and zero-inflated count rates
- 13. Amaia Iparragirre, <u>Irantzu Barrio</u>. Optimism correction of the AUC with complex survey data
- 14. <u>Oliver Kemp<sup>S</sup></u>, Ioannis Kosmidis. Bias-reducing adjustments for generalised additive models
- 15. <u>Yuan Liu<sup>S</sup></u>, Mu Niu, Claire Miller. Sparse intrinsic Gaussian processes for prediction on manifolds: expanding applications to environmental contexts
- 16. Ivana Malá. Number of jobs during working life based on SHARE data
- 17. Jacob Martin, <u>Carlo Giovanni Camarda</u>. Modelling age-space mortality dynamics in small areas
- 18. <u>Ana María Martínez-Rodríguez</u>, Antonio Conde-Sánchez, María José Olmo-Jiménez, José Rodríguez-Avi. DGLMExtPois package: regression models for under-dispersed count data

- 19. <u>Eamonn Organ<sup>S</sup></u>, James Sweeney. Spatio-temporal models for high resolution wind speed maps
- 20. <u>Johannes Piller<sup>S</sup></u>, Helmut Küchenhoff, Andreas Bender. Flexible additive models for multievent survival analysis
- 21. Luigi Cao Pinna, Claire Miller, Marian Scott. Latent Dirichlet allocation and hidden Markov models to identify public perception of sustainability in social media data
- 22. <u>Nicola Piras<sup>S</sup></u>, Silvia Columbu, Jeroen K. Vermunt. Model selection procedure in multilevel cross-classified latent class models
- 23. <u>Xavier Piulachs</u>, Klaus Langohr, Guadalupe Gómez. Semi-Markov multistate model with interval-censored transition times
- 24. <u>Sophie Potts<sup>S</sup></u>, Anja Rappl, Karin Kurz, Elisabeth Bergherr. Joint models for longitudinal and time-to-event data in social science research
- 25. <u>Sumal Randeni<sup>S</sup></u>, Kenan M. Matawie, Laurence A. F. Park. Residual analysis in information retrieval models
- 26. <u>Martje Rave<sup>S</sup></u>, Göran Kauermann. Bridging the data gap Estimate the exit rates, entries, and exits using only data on occupancy
- 27. <u>Michael Renfrew<sup>S</sup></u>, Bruce J. Worton. A comparison of extreme gradient and Gaussian process boosting for a spatial logistic regression on satellite data
- 28. Juan M. Rodríguez-Díaz, M. Teresa Santos-Martín, Irene Mariñas-Collado. Design optimality for a general alcohol model for the human body
- 29. <u>Ullrika Sahlin</u>, Zheng Zhou. A suggestion for a test if a calibrated quantitative adverse outcome pathway is chemical agnostic based on between chemical heterogeneity
- 30. Kristína Sakmárová<sup>S</sup>, <u>Arnošt Komárek</u>, Martin Otava. Employing random effects in variance components modelling
- 31. <u>Mohammad Sayari</u>, James Durrand, Christopher Taylor, Jochen Einbeck, Ehsan Kharatikoopaei, Joshua Craig, Nathan Griffiths. Using linear mixed models to compare a self-assessed frailty score with clinician assessed scores in patients approaching major surgery
- 32. <u>Paul Wilson</u>. An updated Wilcoxon-Mann-Whitney test
- 33. Qing Zhang, Germaine Uwimpuhwe, Dimitris Vallis, Akansha Singh, Tahani Coolen-Maturi, Jochen Einbeck. Elicitation of priors for intervention effects in educational trial data
- 34. <u>Yingjuan Zhang<sup>S</sup></u>, Jochen Einbeck. R package mult.latent.reg for multivariate response scenarios with latent structures
- 35. <u>Zhaoxi Zhang<sup>S</sup></u>, Vanda Inácio, Miguel de Carvalho, Sara Wade. The underlap coefficient as a measure of a biomarker's discriminatory ability and covariate dependence in cluster analysis
- 36. <u>Zhaoyuan Zou<sup>S</sup></u>, Ruth O'Donnell, Claire Miller, Duncan Lee, Craig Wilkie. A computationally efficient spatial-temporal fusion model for reflectance data

## 38th IWSM 2024 -Invited Speakers

#### Monday, 11:00-12:00

#### Dimitris Rizopoulos Dynamic predictions from joint models using super learning

Joint models for longitudinal and time-to-event data are often employed to calculate dynamic individualized predictions used in numerous applications of precision medicine. In this work, we use the concept of super learning to specify a weighted combination of the dynamic predictions calculated from a library of joint models with different specifications. The weights are selected to optimize a predictive accuracy metric using V-fold cross-validation. We use as predictive accuracy measure the expected predictive cross-entropy. All proposed methodology is implemented in the freely available R package JMbayes2.

#### Tuesday, 10:40-11:40

#### Fiona Steele

# Modelling correlations among grouped random effects in multilevel models with an application to the estimation of household effects on longitudinal health outcomes

A standard assumption of multilevel models is that all the random effects at a given level in the data structure are independent for different units. We develop multilevel models for grouped data structures where correlations are allowed between pairs of random effects for units in the same group, and within-group random effect correlations may depend on covariates that characterise the relationship between pairs of units. Constrained MCMC estimation is used to ensure that the group-specific correlation matrices are positive definite. The research is motivated by the study of household effects in longitudinal studies where household membership may change over time. Household random effects are allowed to be correlated within clusters of households that share individuals over time, with correlations depending on covariates that describe the connections between household pairs. The proposed model is applied in analyses of household and area effects on self-rated health in the UK.

#### Wednesday, 10:40-11:40

#### Maria Kateri Statistical modelling through the lens of divergence measures

Standard statistical models such as models for contingency tables, logistic regression, and models for rank data are revisited and redefined in a statistical information theoretical context, connecting them to divergences. This fact, on the one hand, reveals new properties for these models that lead to deeper understanding of their nature and new interpretation options and, on the other hand, offers the possibility of generalising them into flexible families of models. Choosing as divergence the Cressie-Read divergence, which is a parametric family, flexible parametric families of models are derived, controlling the scale by a single parameter that can be fixed or estimated by the data.

#### Thursday, 10:40-11:40

#### Robin Henderson Statistical modelling for big and little data

While the difference between "Data Science" and "Statistics" disciplines is, at best, blurred, many people associate machine learning methods and big data with the former, and modelling and inference for small samples (little data) with the latter. We present a big data application where no sophisticated method at all is needed, a small data application where a partial modelling approach seems useful, and a big-and-little data application where we can borrow strength from limited information in a large sample, to improve estimation based on more detailed data in a small sample.

#### Friday, 10:50-11:50

#### Ernst Wit Advances in modelling dynamic networks

Many automatic monitoring systems generate big dynamic network data, also called relational data: from invasive species diffusion across the globe (10-100K), bike-sharing rides between bike stations (100K-1M) to patent citations of novel technologies (10M-100M). The aim in analysing these data is typically to discover what drives the interactions to find effective strategies, respectively, to control invasive species, to predict bike sharing at any location at any time, to develop technological innovation.

This short introduction explores the advancements in relational event modelling (REM) within the context of time-stamped relational data, commonly generated by email exchanges and social media interactions, but covering also the applications mentioned above. In a short introduction to REMs, we make the connection to generalized linear models. The GLM connection allows easy generalizations to mixed effect additive REMs, demonstrating how to integrate non-linear specifications and time-varying covariate influences. I will show how emergence effects, such as reciprocity and triadic effects, can be modelled via temporal counter-parts of traditional network statistics. Global covariates, previously challenging in traditional REMs, are addressed, allowing the inclusion of factors such as weather or time-of-day. We derive goodness-of-fit statistics and apply the framework to several interesting and challenging studies.

My overall aim is to show a simple, but rich framework for modelling dynamic networks using techniques that are highly familiar in the statistical modelling community.

## 38th IWSM 2024 -Proceedings volume

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