

THE ISBA BULLETIN



Vol. 24 No. 3

September 2017

The official bulletin of the International Society for Bayesian Analysis

A MESSAGE FROM THE PRESIDENT

- Kerrie Mengersen -
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Hello fellow ISBA members!

It is amazing to see the breadth of Bayesian research and implementation undertaken by members of our Society. For example, our journal, *Bayesian Analysis*, provides evidence of the dynamic way in which Bayesian theory, modelling and application are still evolving. A glance at the current and future issues reveals new ideas in foundation topics such as priors, goodness of fit, model comparison, uncertainty quantification and p-values, as well as modelling challenges such as high dimensional and structured data, approximations, mixtures and design, and of course new enabling algorithms. The range of ways in which these ideas can be translated to practice is exemplified by applications to ecology, bioinformatics and econometrics. And this is only two issues! The editorial team of *BA* have our collective gratitude for continually providing such an exciting and challenging canvas of Bayesian research to the world.

Bayesian statistics also rates regular mentions among the world's best journals. For example, articles in *Nature* and *Science* range from a review of Bayes' Theorem in the 21st century, to descriptions of Bayesian models and algorithms, and applications in bioinformatics, biology, disease, animal behaviour and epidemiology.

A different perspective of the good work undertaken by members our profession can be gleaned by browsing media releases that mention the word 'Bayesian'. Take a minute to browse mainstream newspapers such as the *Guardian*, *New York Times*, Beijing-based *National Science Review*, *Times of India*, the *Australian* and the *Sydney Morning Herald*, and the *Dawn* in Pakistan.

It is reassuring—and fun!—to read expositions of fundamental concepts such as Bayes' theorem, degree of belief and the Bayesian world view, as well as topical articles on fixing fake news, justice and law, big data analysis, police use of force, statistical time travel, racism, AI and Bayesian reasoning as an explanation for some mental disorders.

As we enjoy this expansion and these successes, we keep in mind the struggles of some of our colleagues across the world. Their trials include defending statistical independence, obtaining access to scholarly material and training, and maintaining research in challenging conditions. As a Society, we support them in these efforts.

Along side these amazing interactions with the wider world, there have also been some important updates within ISBA. 2017 has seen our new website up and running. Sincere thanks to all those involved in this. Recently two key features of the page have gone live: the job board (continued page 2)

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(under “Resources” from the main page), and the first big wave of information about the 2018 World Meeting in Edinburgh, including our keynote and foundational lecture speakers, as well as travel information. If you haven’t already done so, please visit <https://bayesian.org/> to check out this information and the rest of the page. Let us know if you think we can make it better or if you find any broken links.

Finally, the ISBA elections will be held in the next month or so—please watch for the communication on these and participate in this important process.

– Kerrie Mengersen

FROM THE EDITOR

- Beatrix Jones -

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If you are like me, you will be excited to read the information about the 2016 ISBA awards in this *Bulletin*. Kerrie mentioned the broad scientific applications of Bayesian statistics; the Mitchell award represents the pinnacle of this sort of work. The Savage award honors the best of that unique form of dissemination, the PhD dissertation. At their best, dissertations are full and coherent explorations of new and exciting ideas, so the Savage awardees represent not just the vast energy of our PhD students, but some of the most exciting work from different corners of Bayesianism.

This issue we have not included a separate section from the program council, but see News of the World for upcoming events, especially upcoming deadlines for ISBA@NIPS workshops, OBayes, and BayesComp. For those eagerly awaiting more news on the 2018 World Meeting, the website has been recently updated, with more to follow soon. If you want to get in the mood for these exciting meetings, see Isadora Antoniano’s enthusiastic reports on this summer’s BISP and BNP meetings.

Thanks to all the regular and one off contributors to the Bulletin. We hope to get the final issue of the year out for you to enjoy over the holidays. Until then!

-Beatrix Jones

UPDATES FROM BA

- Bruno Sansó -

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The September issue of the journal is available online at <https://projecteuclid.org/current/euclid.ba> As in previous recent issues, this issue does not include a paper with discussion as there is a need to reduce the long list of papers in advance publication status. The December issue will feature the discussion paper: “Uncertainty Quantification for the Horseshoe” by Stéphanie van der Pas, Botond Szabó, and Aad van der Vaart. The discussants of will be Ismael Castillo, Ryan Martin and Nic Polson. The paper is already available in advanced publication from <https://projecteuclid.org/euclid.ba/1504231319>. If you want to contribute a discussion to this paper please submit your contribution, no longer than two pages using the EJMS system, before October 15. The September issue includes a new invited review paper. This is written by Nalan Baştürk, Lennart Hoogerheide, and Herman K. van Dijk with the title “Bayesian Analysis of Boundary and Near-Boundary Evidence in Econometric Models with Reduced Rank”. It is available from <https://projecteuclid.org/euclid.ba/1501120970>. The paper focuses on the problem of weak empirical evidence near and at the boundary of the parameter region, which is a predominant feature in econometric models. Examples are macroeconomic models with weak information on the number of stable relations, microeconomic models measuring connectivity between variables with weak instruments, financial econometric models like the random walk with weak evidence on the efficient market hypothesis and factor models for investment policies

with weak information on the number of unobserved factors. A Bayesian analysis is presented of the common issue in these models, which refers to the topic of a reduced rank. The paper discusses a lasso type shrinkage prior combined with orthogonal normalization which restricts the range of the parameters in a plausible way. The application considered in the paper illustrates the fact that the use of the proposed approach may, in general, lead to more accurate forecasting and decision analysis in other problems in economics, finance and marketing. I would like to thank Professor van Dijk, who accepted my invitation to write this paper, as well as his co-authors Nalan Baştürk, Lennart Hoogerheide for contributing this paper to BA. I expect that it will be a very useful reference for people interested in the state of the art of methods that are key for Bayesian econometrics.

2016 ISBA AWARDS

- The ISBA Awards Committee -

The following awards were presented in August at the Joint Statistical Meetings in Baltimore, Maryland, USA. Congratulations to the awardees on their excellent work!

The Mitchell Prize: This prize is awarded in recognition of an outstanding paper that describes how a Bayesian analysis has solved an important applied problem. This year the prize goes to:

Lin Lin, Greg Finak, Kevin Ushey, Chetan Seshadri, Thomas R Hawn, Nicole Frahm, Thomas J Scriba, Hassan Mahomed, Willem Hanekom, Pierre-Alexandre Bart, Giuseppe Pantaleo, Georgia D Tomaras, Supachai Rerks-Ngarm, Jaranit Kaewkungwal, Sorachai Nitayaphan, Punnee Pitisuttithum, Nelson L Michael, Jerome H Kim, Merlin L Robb, Robert J O'Connell, Nicos Karasavvas, Peter Gilbert, Stephen C De Rosa, M Juliana McElrath, and Raphael Gottardo for their paper "COMPASS Identifies T-cell Subsets Correlated with Clinical Outcomes", published in *Nature Biotechnology*, 33(6), 610-616, 2015.

The Savage Award: The Savage Award, named in honor of Leonard J. "Jimmie" Savage, is bestowed each year to two outstanding doctoral dissertations in Bayesian econometrics and statistics. This year an additional two theses earned honorable mentions.

Scott Linderman Winner, Theory and Methods, for: *Bayesian methods for discovering structure in neural spike trains*

Scott's thesis sits at the interface between Bayesian computational statistics and neuroscience. It makes several core contributions to modeling and inference for point processes and networks, but also takes a broad and authentic view on the underlying neuroscientific questions. It combines novel methodological contributions with deep applied collaboration in an important scientific domain. The broad objective of the thesis is to develop a rich set of Bayesian methods for understanding computation in the brain, by inferring functional connectivity from neural spike trains using recently-developed nonparametric graph representations based on the Aldous-Hoover formalism.

Yang Ni, Honorable Mention, Theory and Methods, for: *Bayesian graphical models for complex biological networks*.

Yang proposes novel Bayesian methods for structural learning as inference on latent graphs in bioinformatics applications. Motivating applications include non-linear gene regulatory networks, data integration, cancer surveillance and precision medicine. The thesis develops a novel sparse DAG models based on splines, multidimensional graphical models based on Cholesky-type decompositions, and a novel class of graphical regression models that allows graphs to vary with covariates.

Federico Camerlenghi Winner, Applied Methodology, for: *Hierarchical and nested random probability measures with statistical applications*.

The main goal of Federico's research was the development of models and inference for random probability measures that can handle data displaying dependence structures going beyond the usual exchangeability assumption. Federico's contribution inserts itself into the huge body of literature on this subject that appeared over the last 15 years following pioneering work by MacEachern (1999), but radically innovates with respect to the existing literature by being able to determine exact distributional results for such complex models. His work constitutes a highly significant improvement over current results which are almost exclusively simulation based.

Pritwish Bhaumik Honorable Mention, Applied Methodology, for: *Bayesian estimation and uncertainty quantification in differential equation models*.

Prithwish developed Bayesian methods for analyzing regression models that define the regression function implicitly by differential equations. In a two-step approach he first defines a prior on the regression function based on a B-spline basis and then only induces a distribution on the parameters of the differential equation system from that on the regression function. Prithwish studied asymptotic behavior of the posterior distribution and showed that the posterior contracts at the parametric rate as expected and satisfies a Bernstein-von Mises theorem. This is a highly significant result implying that Bayesian credible sets have asymptotically correct frequentist coverage, and hence the notions of uncertainty quantification for Bayesian and frequentist are approximately the same.

CONFERENCE REPORTS

- Isadora Antoniano -

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BISP10

The 10th International Workshop of Bayesian Inference in Stochastic Processes (**BISP10**) took place at Bocconi University in Milan, Italy this past 13-15 June. Following the workshops held in Madrid (1998), Varenna (2001), La Manga (2003), Varenna (2005), Valencia (2007), Bressanone (2009), Madrid (2011), Milano (2013) and Istanbul (2015), this latest edition of BISP was dedicated to Italian professor Pietro Muliere celebrating his influential research contributions to the theory and the applications of stochastic processes and Bayesian inference. Seven invited sessions, two contributed sessions and over thirty posters following the tradition of mixing junior and senior researchers, made for a rich and interesting program. The topics ranged from the newest solutions to traditional problems like inference and prediction in dynamic systems to the more recent models for complex data structures, including bridges with other disciplines, such as stochastic programming and a session discussing applications to Paleo Climate Science, courtesy of the [Past Earth Network](#).

BISP10 was preceded by a one day conference [Recent Developments in Bayesian Theory and Stochastic Processes](#), in honor of Pietro Muliere on the occasion of his 70th birthday. Nine presentations by renowned researchers from across the world gave a panorama of the influence of Muliere's work over the years, both as a researcher and an educator. The day was closed by Pietro himself, reminding us all of the importance of thinking and exchanging ideas and of the responsibility of young and old towards the future of research.

With over one hundred participants each, these events raised for a few days the average level of statistics in Milan!



Figure 1: Left: Pietro Muliere and his most recent PhD student, Andrea Arfè. Right: Participants to the conference in honor of Pietro Muliere on the occasion of his 70th Birthday. Photo credit: Angelina Yavorskaya

BNP 11

This past 26-30 June, over 200 Bayesians from around the globe defied for a week an unexpectedly hot and wet weather in Paris, to give life to the 11th edition of the Bayesian Nonparametrics (**BNP 11**) conference hosted at the **Ecole Normale Supérieure**. A diverse program of the highest quality was compacted into eleven invited sessions, four contributed sessions and three plenary addresses by Ryan Adams, Barbara Engelhardt and Peter Orbanz. And the two poster sessions hosted at the Esclalongon building of the **Université Pierre et Marie Curie** will be hard to forget, with their assortment of beer, wine, cheese and other French specialties, but more importantly the 107 posters on various exciting topics.

Four **ISBA Lifetime Members Junior Researcher Award** (700 euros each) were received by Martin Trapp, Anqi Wu, Tamara Fernandez and Roberta De Vito.



Figure 2: Winners of the 2017 ISBA Lifetime Members Junior Researcher Award. From left to right: Martin Trapp, Anqi Wu, Tamara Fernandez and Roberta De Vito

BNP travel support funds were awarded to 24 junior participants (500 euros each): Valerio Perrone, Federico Camerlenghi, Benjamin Bloem-Reddy, Daniele Durante, Jonathan Huggins, Alan Riva Palacio, Juho Lee, Xenia Miscouridou, Milad Kharratzadeh, Suprateek Kundu, Victor Veitch, Johan Van der Molen Moris, Alexander Meier, Yordan Raykov, Sally Paganin, Asael Fabian Martinez, Minwoo Chae, Abhijoy Saha, Brenda Betancourt, Akihiko Nishimura, Justin Strait, Moumita Karmakar, Kumarsh Dhara and Kolyan Ray. And 11 more travel support awards (800 euros each) were secured by Steve Mac Eachern for plane tickets from America: Briana Stephenson, Nick Foti, Didong Li, Michael ZhangĎ, Dunamu Housi, Diana Cai, Jieren Xu, Boyu Ren, Rajesh Ranganath, Bastian Galasso and Cecilia Balocchi.

A final show of the great support for junior researchers came in the form of books awarded to the **winners of the poster competition**:

- Monday session:
 - Jarno Hartog : Nonparametric label prediction on a graph
 - Lorenzo Cappello: Recursive non-parametric predictive for a discrete regression model
 - Tamara Fernandez: Posterior Consistency for a Non-parametric Survival Model under a Gaussian Process Prior
 - Gudmund Hermansen (honorable mention): Bernshtein–von Mises theorems for a class of Bayesian nonparametrics setups for stationary time series
- Tuesday session:
 - Valerio Perrone: Poisson Random Fields for Dynamic Feature Models
 - Alexander Meier: Bayesian nonparametric analysis of multivariate time series
 - Valerie Poynor: Bayesian nonparametric modeling for order constrained mean residual life functions
 - Jan van Waaij (honorable mention): The best of both worlds: Adaptive Posterior convergence rates for empirical Bayes Methods in nonparametric diffusion models.

And after such a wonderful experience, I'm sure we're all looking forward to the next BNP conference in 2019.

NEWS FROM THE WORLD

Meetings and conferences

Advances in Approximate Bayesian Inference (ISBA@NIPS Workshop), Long Beach, California, December 8, 2017.

Approximate inference is key to modern probabilistic modeling. Thanks to the availability of big data, significant computational power, and sophisticated models, machine learning has achieved many breakthroughs in multiple application domains. At the same time, approximate inference becomes critical since exact inference is intractable for most models of interest. Within the field of approximate Bayesian inference, variational and Monte Carlo methods are currently the mainstay techniques. For both methods, there has been considerable progress both on the efficiency and performance.

In this workshop, we encourage submissions advancing approximate inference methods. We are open to a broad scope of methods within the field of Bayesian inference. In addition, we also encourage applications of approximate inference in many domains, such as computational biology, recommender systems, differential privacy, and industry applications. Paper submission closes 1

November; see <http://approximateinference.org> for more information.

(Almost) 50 Shades of Bayesian Learning: PAC-Bayesian trends and insights (ISBA@NIPS Workshop), Long Beach, California, December 9 2017.

This workshop aims at gathering statisticians and machine learning researchers to discuss current trends and the future of {PAC,quasi}-Bayesian learning. From a broader perspective, we aim to bridge the gap between several communities that can all benefit from sharper statistical guarantees and sound theory-driven learning algorithms. Paper submission closes 27 October; see <https://bguedj.github.io/nips2017/50shadesbayesian.html> for more information.

BAYESCOMP 2018, Barcelona, Spain, 26-28 March 2018. Bayes Comp is a biennial conference

sponsored by the ISBA section of the same name. The conference and the section both aim to promote original research into computational methods for inference and decision making and to encourage the use of frontier computational

tools among practitioners, the development of adapted software, languages, platforms, and dedicated machines, and to translate and disseminate methods developed in other disciplines among statisticians.

Bayes Comp is current incarnation of the popular MCMSki series of conferences, and Bayes Comp 2018 is the first edition of this new conference series. Abstracts for contributed sessions are due 15 October 2017; poster abstracts can be submitted starting 1st November. See <https://www.maths.nottingham.ac.uk/personal/tk/bayescomp/> for more details.

BAYSM, University of Warwick, UK. 2-3 July, 2018.

This will be the fourth edition of an exciting platform for young researchers in Bayesian statistics, which aims at encouraging discussion, promoting future research and providing the opportunity to meet outstanding senior researchers in this field. Senior discussants will be present for contributed talks and the poster session to advise young researchers with valuable comments. For further information, please visit the conference website: warwick.ac.uk/baysm.

O'Bayes 2017, University of Texas Austin, Texas. December 10-13, 2017.

O'Bayes is the biennial meeting of the Objective Bayes section of ISBA. It is one of the longest running and preminent meetings in Bayesian statistics, going way beyond objective Bayes and covering topics like robust, default Bayesian analysis, reproducibility, variable selection, big data and nonparametric Bayes. Please join the meeting!

The conference site is <https://sites.google.com/site/obayes2017/>.

[com/site/obayes2017/](https://sites.google.com/site/obayes2017/). Early registration closes October 29; poster abstracts can be submitted until November 10.

StanCon 2018, Asilomar Conference Grounds, Pacific Grove, CA. January 10-12, 2018.

Stan is freedom-respecting, open-source software for facilitating statistical inference at the frontiers of applied statistics. This year at the conference, in addition to talks and open discussion, there will be dedicated time for collaborative Stan coding with other attendees and the Stan development team.

Each contributed talk will consist of self-contained knitr or Jupyter notebooks that will be made publicly available after the conference (submission now closed). Detailed information about registration and accommodation at Asilomar, including fees and instructions, can be found on the event website, <http://mc-stan.org/events/stancon2018/>. Early registration ends on Friday November 10, 2017 and no registrations will be accepted after Wednesday December 20, 2017.

Bayes on the Beach 2017, Surfers Paradise, Gold Coast, Australia . November 13-15, 2017.

Bayes on the Beach 2017 is the 12th International Workshop for the Australasian chapter of the International Society for Bayesian Analysis (ISBA) and the annual meeting of the Bayesian Statistics section of the Statistical Society of Australia. (SSA). Speakers include Susan Holmes, Mark Girolami, Scott Sisson, Gael Martin, and Peter Donnelly. Registration closes October 31. Conference site: <https://botb2017.wordpress.com>.

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