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A MESSAGE FROM THE PRESIDENT

by Christian Robert
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Even those of us who took a well deserved break sometimes over the past months are back to work with new duties kicking in, like new courses, new students, new duties, etc. I have had a great summer in Australia, with an honestly super-terrific ISBA meeting superbly organised, idyllically located (except for long runs!) and with deep and innovative talks. In the name of our society, I want to convey here the sincere and heartfelt thanks of all members to the conference organiser and chair of the program committee, Kerrie Mengersen, to the chair of the organising committee, Clair Alston, as well as all those involve in both committees and in helping this meeting being a success. I have personally learned a lot from ISBA 2008 and it has had a impact on my research and I dare to presume this is the same for many participants. The only worry I have is that, by setting such high standards, Kerrie, Clair and others may have discouraged candidates for future ISBA World meetings!!! Let me reassure all potential meeting organisers that the Society will know how to draw from the experience of this last meeting to help them organise the next one. *Continue in page 2.*

A MESSAGE FROM THE EDITOR

by Raphael Gottardo
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Summer is over, and it's now time to go back to our work habits, that is teaching, writing grant proposals, reviewing articles, and more. The good news is that you now have a fresh issue of the ISBA bulletin in your hands, which I am sure will cheer you up. In this issue of the Bulletin, you will find many interesting articles including a protest letter from our own president against an article written in "La Recherche". As you will see if you can read the article, some French statisticians are very knowledgeable about Bayesian inference (sarcasm). In addition to this letter, you will find the usual interview, software, history, news and student sections. Finally, as we are approaching November, you will also find a section about the next ISBA election listing all the candidates along with a short statement provided by each. Please make sure you read what they have to say before voting! ▲

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WORDS FROM THE PRESIDENT, *Continued from page 1.* In early September, I also attended the opening workshop of the SAMSI 2008-09 Program on Sequential Monte Carlo Methods in the Research Triangle. Much to my shame, I must admit this is the first time I was visiting SAMSI and I was so very much impressed by the quality of the program and the superb organisation that I am going back there at the end of the month! Congratulations to Jim Berger for setting such an impressive research organisation and to the organisers of this specific SMC workshop, Arnaud Doucet and Simon Godsill, for setting such an exciting program. For those who cannot attend the workshop, but still feel some kinship with the topic, I recommend you visiting the incredibly rich workshop website!

Now that we are back to the grind, and that I have managed to coerce the last graduate student I could coerce into teaching one group in my R class, I would like to call for members' contributions of teaching material. Most of us are teaching Bayesian Stats at some level or another, in English or not, and you have most likely developed innovative ways to reach out to your students or produced pedagogical teaching packages. Making those available to the whole community through the ISBA website as a unique webpage would obviously benefit all members, especially if you provide the source (LaTeX, Word, R, BUGS, etc.) codes that would allow others to put their name on the front page!, but also to include extras, to switch to another language or level. I know this call has also been made by previous presidents, including Peter Green, and I think we should really push for it, as (a) it could only produce overall improvements in our teaching, (b) it would save new members and younger faculty the time spent in designing a new class from scratch, (c) it would convince more faculty from other fields to teach Bayesian statistics at elementary level, and (d) it would reinforce the image of an open community set forward by ISBA. So please give this project a few minutes and send us your material!

You will notice an additional letter from me in the following pages. I think it is self-explanatory but since I have written it with my presidential hat, it seemed to me natural to let you know about it. Since this issue of the ISBA Bulletin is as usual teeming with interesting items of information, I also want to draw your attention to the call for the Great'08 Challenge, lauched by astronomers towards data analysts, computer scientists, and, above all, statisticians! The model to analyse is complex both by its multilayered structure and by its size, but this is a very good opportunity for us Bayesians to demonstrate the appeal of our approach, especially since astronomers are usually quite sympathetic to the Bayesian approach. When listening to Sarah Briddle presenting the challenge in Paris last week, I realised how difficult this challenge would prove itself for a single team, especially given the six month deadline, but, using this tribune, groups could team up together to come up with (of course!) the best solution.

Best wishes to all for a productive and enjoyable Fall/Spring trimester! ▲

PROTEST FROM THE PRESIDENT

by Christian Robert
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Following a shocking rendering of Bayesian statistics in the French popular Science magazine La Recherche (http://www.larecherche.fr/content/recherche/article?id=23610) last June by a French statistician, Nicolas Vayatis, I sent the following protest letter to its Editor as the ISBA president (my translation, pardon my French!):

As a statistician and as President of the International Society for Bayesian Analysis (ISBA), I would like to protest against the presentation and incredibly simplistic caricature made by Nicolas Vayatis of Bayesian statistics in No. 421 (p.26) of La Recherche.

Firstly, the Bayesian approach has not developed "along with the improvement of computers" but, rather, this approach has been dominant throughout the nineteenth century, from Laplace to Poincaré. Also, the contrast between Bayesian and frequent approaches is definitely not "philosophical"; on the opposite, it deals with the effectiveness and universality of procedures built therein.

Then, the presentation of Bayesian statistical inference made in the article got it all wrong: in

the simple exemple of inference on the probability p of a coin hitting head during 100 tests on the same coin, the probability p also remains a "real" value, both unique and unknown, in the Bayesian approach which merely updates the [posterior] distribution of the probability parameter p given the number of heads obtained during the experiment. This probability distribution is not a belief but a rational construct that update information on p by integrating the pieces of information contained in the comments. Now this distribution is used to deduce an estimate of p as well as to test if the coin is biased or not.

Secondly, contrary to the title, the sectarian hint picked up and spread by the paper ("mostly Anglo-Saxon", "self-centered","Bayesian hymns", "journals that do not accept the frequentist views") decidedly is a thick-skinned caricature in the community even though it does not stand against examination: there are well-established Bayesian statisticians in many other countries than anglo-saxon countries, such as Chile, Brazil, Spain, or Italy, and obviously France. (For instance, a series of global conferences gathers Bayesian statisticians every four years in Spain.) First-rate international journals of mathematical statistics, computational statistics or methodological statistics all include between 20% and 30% of Bayesian articles, they all have had Bayesian editors at one time or another, without a noticeable impact on or the quality of these journal. The only journal mostly devoted to Bayesian techniques is Bayesian Analysis, an electronic journal that was only recently created. Similarly, most national or international statistical societies have had or have chairs that are Bayesians and they apparently survived without collateral damage.

Finally, and it is indeed a story that did not belong in the article, the only Bayesian songs that you can hear at Bayesian conferences are sung at the "cabaret" which concludes the conference banquet. This is a (indeed) Anglo-Saxon tradition of self-derision that is also found in many other conferences outside Bayesian statisticians.

ISBA ELECTIONS

2008 ISBA ELECTIONS

by Robert Wolpert
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Biographical information for each of the candidates appears below. The candidates for president have also included statements about what they intent to accomplish. This information is also currently accessible on the ISBA web-site. The 2008 elections of future ISBA officers will take place electronically at the ISBA web-site from 15 October through 15 November. Instructions for voting will be emailed to all current ISBA members prior to the election.

President 2010 (President Elect 2009, Past President 2011)

Peter Müller (MD Anderson, Univ Texas, USA)

- Affiliation and Current Status:
  Professor of Biostatistics, University of Texas M.D. Anderson Cancer Center, Houston, USA.
- Areas of Interest:
  Nonparametric Bayes, Bayesian computation and MCMC, Bayesian decision problems, biostatistics, Bayesian clinical trial design, hierarchical models.
- Journals:
  Bayesian Analysis (of course!), Applied Statistics, Biometrics, Bayesian Statistics 8, JASA, JRSSB.
- Previous Service to ISBA:
  Board member (1995-98, 2005-07), treasurer (2002-04), chair of Savage Prize Committee, Program Committee (chair 2006, vice-chair 2007-08).

It is a great honor to be nominated for ISBA president. ISBA is now arguably the prime professional society in Statistics. I would be proud to contribute towards maintaining and improving this strength. The means to achieve this are continued support of outstanding scientific meetings, continued excellence of our journal, and service to the Bayesian community and outreach beyond. We now have a well established and

functioning routine of regular ISBA world meetings and it is a good time to increase our activities beyond the world meetings. Some progress is easy by co-sponsoring good meetings. Most organizers welcome ISBA co-sponsorship as an important endorsement of scientific excellence. Another direction is the organization of more special topic meetings and workshops and regional chapter meetings. Closely related to focused workshops is the organization of sections. ISBA has reached sufficient membership and maturity as a professional society to initiate sections within the society. The formal process to start a new section is amazingly simple and straightforward and has been part of our bylaws for a while. I would like to understand why we have not yet formed sections, and what it would take to make it more attractive, or why it is just fine to continue without sections. Perhaps simple mechanisms like designated invited sessions at the world meeting, space in the Bulletin and last not least financial and organizational support for section activities could help.

Besides membership and meetings a third big strength of ISBA are our publications. Bayesian Analysis and the ISBA Bulletin are in competent hands, and I believe are doing very fine. Ensuring continued strength of our publications I believe is one of the important responsibilities of the executive committee.

Fabrizio Ruggeri (CNR-IMATI, Milano, IT)

- Affiliation and Current Status:
  Research Director, Consiglio Nazionale delle Ricerche, Istituto di Matematica Applicata e Tecnologie Informatiche, Milano, Italy

- Areas of Interest:
  Bayesian inference in stochastic processes, Bayesian robustness, Reliability, Industrial statistics, Bayesian nonparametrics

- Journals:
  Journal of Computational and Graphical Statistics, Bayesian Statistics 7, Risk Analysis, Reliability Engineering and Systems Safety, Bulletin of Mathematical Biology, TEST.

- Previous Service to ISBA:
  Board member (2002-04), Member of ISBA Nominations Committee (three times), Member of Savage Prize Selection Committee (three times, once as Chair of Theory and Methods), Member of De Groot Prize Selection Committee, Chair of ISBA2004 Scientific Committee, Founding (and current) Editor of Bayesian Analysis, Production Editor of Bayesian Analysis (2005-06), Editor of ISBA Bulletin (formerly ISBA Newsletter, 1999-2002), Chair of ISBA endorsed workshops.

I am flattered by the nomination, with my friend Peter, for President of a very authoritative society like ISBA. After a B.Sc. thesis on nonparametric Bayes in Milano and a M.Sc. at Carnegie Mellon, I got my Ph.D. at Duke (again nonparametrics). My research interests and cooperations are wide, from Fréchet derivative, concentration function and wavelets to reliability, project management, clinical trials, prey-predator systems, telecommunications, etc.

Attracting and involving young researchers is a top priority. As Chair of ISBA2004 Scientific Committee, I worked hard with Pilar Iglesias to bring many young people to Chile and last year some of us promoted a Fund named after her to support young researchers' participation in future. Within ISBA meetings and activities, young researchers should be encouraged to take responsibilities. ISBA should organise courses on specialised topics, like the ABS (Applied Bayesian Statistics) summer school in Italy, of which I am Co-Director since 2004. ISBA should promote diffusion of Bayesian methods and practice in developing countries; nowadays, I am giving my small contribution in Algeria.

ISBA should encourage workshops on both established and hot topics (I promoted those on robustness in the 90's, the first of the current nonparametric series and the BISP, Bayesian Inference in Stochastic Processes, series where most talks are by young researchers).

The President's job is not only about science, but also about supervising ISBA operations and keeping constant interactions with its members. I can rely on my recent experience as President of ENBIS (European Network for Business and Industrial Statistics), a larger and less established society than ISBA. I found cooperation with other scientific societies very important. ISBA should look forward to more strict cooperation not only with international and national statistical societies but also with other scientific communities and organise joint workshops, sessions and

projects to favour cross fertilisation. The cooperation, and the involvement of Bayesians outside ISBA, should benefit by the expansion of national chapters and their activities and the creation of thematic working groups.

I like challenges, like being Editor-in-Chief of the 4-volumes Encyclopedia of Statistics in Quality and Reliability (2007) and, since 2007, of Applied Stochastic Models in Business and Industry, now the official ISBIS (an ISI section) journal. In 1999 I completely reshaped the ISBA Newsletter, producing a Bulletin which, with minor changes, is still a stimulating reading. I have been involved in Bayesian Analysis even before its launch. I believe Bulletin and journal are among the best achievements by ISBA, and Brad should be supported in his hard work to make Bayesian Analysis a top statistical journal.

If elected, I promise it will not be a dull year!

Board of Directors 2009-2011 (4 openings, listed randomly)

Jonathan Rougier (University of Bristol, UK)
I am a Lecturer in Statistics at the U. of Bristol, and have been a statistician for nearly twelve years (before that I was, for my sins, an economist). My interest is in the statistical representation of uncertainty in science, notably for the prediction and control of complex physical systems like the climate, or avalanches. This is a broad area that includes some philosophy and epistemology, but the value-added is in core statistics: the design of experiments, statistical modelling, elicitation, Bayesian updating, and visualisation and communication. I work closely with scientists, and try to understand their concerns and their language, and to promote statistical methods that are intuitive and not overly-complicated. For this reason I favour a Bayes linear approach. As well as papers in mainstream Statistics journals (e.g. JASA, JCGS, Applied Statistics, JSPI), I also publish in general and specialist science journals (e.g. Phil. Trans. Roy. Soc., SIAM J. Sci. Comp., Climatic Change, J. Hydraulic Res.)

Brunero Liseo (Università di Roma La Sapienza, IT)
Brunero Liseo (PhD Sapienza, Roma, Statistics). I am a professor of Statistics at Sapienza, Business School. I started my career working on some foundational issues related to Likelihood Principle and the use of reference priors in objective Bayes analysis. After moving to a Business school I became aware of the emergence of so many opportunities of disseminating Bayesian ideas in areas like Official Statistics, Econometrics, data mining. You can find more on my webpage http://3w.eco.uniroma1.it/utenti/liseo

I am particularly interested in creating more interdisciplinary conversations with both natural and social scientists, in order to make Bayesian philosophy and practice more popular than it is actually among practitioners.

Márcia D'Elia Branco (Universidade de São Paulo, BR)
I am Associate Professor of Statistics at the University of São Paulo (USP), Brazil. I am the current vice-coordinator of the PHD Statistics Program at USP. My research interest includes skewed symmetric distributions, reference prior and Bayesian analysis in linear and generalized linear models. I have published papers in Canadian Journal of Statistics, Journal of Multivariate Analysis, Biometrics, Statistics in Medicine, Journal of Statistics Planning and Inference and Bayesian Analysis.

I co-founded the Brazilian Chapter of ISBA, known as ISBrA (2000). I have helped to organize the First Latin-America Bayesian Meeting in Ubatuba, SP, Brazil (2002), which was held along with the 6th Brazilian Bayesian Meeting. From March 2006 to February 2008, I was president of the ISBrA and organized the 9th Brazilian Bayesian Meeting (9 EBEB). I would be pleased if my work experience could be useful for ISBA, as a member of the Board.

Colin Fox (University of Otago, NZ)
I am Assoc. Professor of Physics at Otago University in New Zealand. My main research interests are computational (Bayesian) inference for inverse problems (big Physics-based likelihoods), and mathematical acoustics. I have recently written reviews of Bayesian methods for Measurement Science and Technology, and Inverse Problems in Science and Engineering, with the desire of seeing Bayesian methods properly used in those fields. I do quite a bit of consultancy, mostly building Bayesian solutions in the 'measurement' industry. Most of my papers are in applications journals but you will find a few in JCGS and CompStat. For over ten years I have taught Bayesian inference and MCMC to Physics and Math graduates who seem to soak it up.

(Why do Stat departments claim it's hard?)

I am a relative latecomer to ISBA. Since joining for Valencia 2006 I have been impressed by the high quality of practice and debate (and cabaret) sponsored by ISBA. I'd say it's a great thing. You can check me out at URL http://www.physics.otago.ac.nz/people/fox/

David Dunson (Duke University, USA)

My methodologic research interests include nonparametric Bayes, functional data analysis, model selection, multivariate analysis using latent variable and random effects models, and (most recently) image analysis and signal processing. I am also interested in applications to challenging high-dimensional problems in epidemiology, genetics and machine learning. I have published papers in JRSS-B, JASA-ACS, JASA-TM, Biometrika, Journal of the American Medical Association and Statistica Sinica. I have served on the Savage Award committee, and have been very active in organizing invited sessions on Bayesian statistics for the Joint Statistical Meetings and the International Biometrics Society. I am co-editor of Bayesian Analysis, and am an Associate Editor for Biometrika, JASA-ACS and Psychometrika. I am excited about the possibility of contributing to ISBA as a member of the Board.

David van Dyk (Univ Calif Irvine, USA)

I am a Professor in the Department of Statistics at the UC Irvine. I received my Ph. D. from Chicago (1995) and was elected ASA Fellow (2006). My scholarly work focuses on methodological and computational issues involved with Bayesian analysis of highly structured statistical models and emphasizes serious interdisciplinary research, especially in astronomy. I am particularly interested in improving the efficiency of computationally intensive methods involving data augmentation, such as EM-type algorithms and various MCMC methods. My research appears in JASA, Biometrika, JRSSB, Bayesian Analysis, Statistical Science, and the Astrophysical Journal. I am currently Editor-in-Chief of the Journal of Computational and Graphical Statistics and have served as an Associate Editor for JASA and Statistica Sinica. I was Program Chair for AISTATS 2008 and the ASA Section on Bayesian Statistical Science (JSM 2008) and served on the Scientific Program Committee for Statistical Challenges in Modern Astronomy III (2001), IPAM Conference on Mathematical Challenges in Astronomical Imaging (2004), the SAMSI program on Astrostatistics (2006), and Interface 2008.

Satyanshu Upadhyay (Banaras Hindu University, IN)

I am currently Professor at the Department of Statistics and associated with Dept. of Science & Tech. Centre for Interdisciplinary Mathematical Sciences at BHU as Principal Investigator, Bayesian Statistics. My current research interests include computation, reliability, accelerated testing, regression and survival analyses, etc. using Bayes paradigm. I have published papers in IEEE Trans. Reliab., Comm. Stat., JSPI, CSDA, Stat. Papers, Sankhya, among others.

I have served in scientific and advisory committees of various conferences/workshops and organized a number of successful events including the one cosponsored by ISBA at BHU in Jan. 2005. This event was a landmark in the Indian Bayesian history.

I am the member of ISBA since its inception and worked twice as member of nomination committee. I took a lead role in creating a Bayesian movement and unifying the Bayesian statisticians in India that finally resulted in the formation of Indian Chapter of ISBA and Indian Bayesian Society (with me as current Secretary). I am editor of Indian Bayesians' Newsletter since 1996. I aim to bring people from developing countries under the umbrella of ISBA for strong global interactions of Bayesians.

Katja Ickstadt (Technische Universität Dortmund, DE)

I am a professor for mathematical statistics with applications in biometry at the Department of Statistics, Technische Universität Dortmund in Germany. My main areas of research comprise fancy Bayesian regression models such as the modeling of spatial phenomena, dose-response curve modeling and models for inverse problems, as well as clustering and classification for genetic and proteomic data. I have published papers in statistics and biostatistics journals such as JASA, Biometrika, Biostatistics and Biometrics, but also in scientific journals of other research areas such as the Journal of Toxicology and Environmental Health.

I have served as an associate editor for Bayesian Analysis from the start of the journal until the end of last year and I am now an associate editor for Biostatistics and for Statistical Papers. I have also served on the Savage Trust

Committee from 2005 until 2007. I am excited about this nomination and would very much enjoy to support ISBA as a member of the Board.

INTERVIEW

VALEN JOHNSON

by Donatello Telesca
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Valen Johnson is a professor of biostatistics at the University of Texas M.D. Anderson Cancer Center. Prior to joining the faculty at M.D. Anderson, he was a professor of biostatistics at the University of Michigan, and a professor of statistics and decision sciences at Duke University. He has written two books, Grade Inflation: A Crisis in College Education and Ordinal Data Modeling (with Jim Albert). He is a fellow of the Royal Statistical Society and the American Statistical Association.

I am very lucky to sit across Val's office at M.D. Anderson. However, Val is not so lucky as the same physical proximity made him an easy target for my interview.

1. *This question is often redundant in the ISBA interviews. However, I think it is always interesting to learn a little bit more about our "victims", so I will keep asking. How did you become a statistician?*

I was encouraged to pursue a career in statistics by Carl Morris, who at the time was a professor in the Department of Mathematics at the University of Texas at Austin. I was a US Army officer at Fort Hood, and I wanted to complete a masters degree in math before resigning my commission. Carl was one of several professors at UT who agreed to meet with me after normal class hours. I really enjoyed his mathematical statistics course and went on to do a masters thesis under his direction.

2. *You recently published an interesting article in PNAS about the peer review system of NIH (National Institutes of Health) grants. How did you get interested in the project?*

After serving as an ad hoc member on several NIH study sections, I realized that the simple averaging scheme that the NIH uses to obtain priority scores for grant proposals is a rather inefficient use of the peer review data. So in 2004 I arranged a meeting with Dr. Brent Stanfield, the acting director for the Center for Scientific Review at NIH, to propose a pilot project to collect and analyze peer-review ratings. Dr Stanfield was very receptive to the idea and agreed to support the project.

3. *How does the NIH currently make funding decisions?*

Poorly!

The NIH basically averages the scores assigned to a proposal by all members of a study section, and then ranks the proposals within each study section according to their average scores. No additional weight is given to the scores assigned to a proposal by the two or three individuals who actually read it (the remaining study section members base their scores on a discussion of the proposal led by its primary reviewers), and no account is made for differences between the scoring patterns of the proposal's readers. Because (non–reading) study section members are essentially required to rate the proposal within the range of scores established by the proposal's readers, unusually stringent or lenient scoring of a proposal by its readers can have a dramatic impact on its final ranking. In addition, the NIH confuses mean proposal scores with actual proposal merit, and thus makes no adjustment for the uncertainty in proposal scores before making funding decisions. As a consequence, a proposal that received (say) a priority score of 1.51 might be funded, while two proposals that were half as expensive and received priority scores of 1.52 might not. But the difference between a 1.51 and 1.52 priority score could be completely inconsequential, particularly since no account is made for the scoring behavior of the proposal's readers.

4. *What do you think is the main challenge associated with the task of deciding who gets funding and who does not?*

I think the main obstacle in reforming the NIH peer-review system is overcoming a prejudice held by the senior leadership of the NIH against the use of modern statistical methods. To substantiate this prejudice, it is only necessary to note that no statisticians serve on the Peer Review Advisory Committee (PRAC), the NIH committee that is charged to study and reform the peer review process, despite the obvious fact that the interpretation of peer review ratings is inherently a statistical problem. I suspect that this prejudice arises from two related phenomena. First, many scientists involved in the peer review process mistakenly believe that percentile scores can be interpreted as if they represented a simple sample mean computed from a random sample of continuous measurements. Second, as an NIH study chair recently related to me in an email correspondence, participants in the NIH peer review system "have no expertise in statistics (and maybe even something of an antipathy to it ..." They are thus hesitant to accept interpretations of priority scores generated by more sophisticated methods.

I suppose that society is fortunate that scientists in other fields are not subject to the same constraints as statisticians. Can you imagine the situation that would result if physicists, biologists, and chemists were required to use only methods that were widely understood by statisticians and other members of the public at large?

5. *In your PNAS article you propose an elegant decision theoretic solution to the problem. What do you think would be the benefits associated with the application of a formal decision scheme, which accounts for costs and uncertainties?*

The primary benefit would be that the NIH could fund more and better science. By considering both the uncertainty associated with proposal rankings and proposal costs, the NIH could immediately fund more proposals from among the group of proposals that fall near the payline but that were not distinguishable based on their peer-review ratings. In the longer term, the effect of considering costs in funding decisions would be to encourage investigators to trim requested budgets. This would allow the NIH to fund a still greater number of proposals.

6. *Among your many scientific interests is some very original work on Bayesian Hypothesis Testing. Reading your recent article on non-local prior densities, I was surprised to learn some surprising results about commonly used prior models. What is a local alternative prior and why is it bad?*

Loosely speaking, a local alternative prior density is a density that assigns positive mass to parameter values that are consistent with the null hypothesis. Local alternative prior densities have the disadvantage of making it difficult to obtain evidence in favor of a (true) null hypothesis. For small or moderate sample sizes, this often means that it is literally impossible to obtain even moderate evidence in favor of a true null hypothesis, though it might be possible to obtain conclusive evidence in favor of a true alternative hypothesis. I think that such highly asymmetric treatment of hypotheses is appropriate only from a frequentist perspective.

At a more philosophical level, local alternative priors do not provide a mechanism for distinguishing between scientific hypotheses when hypotheses are viewed from an instrumentalist perspective.

7. *In your article you define two classes of non-local alternative priors. I remember seeing pictures of those priors in one of your talks and thinking that what I saw on the screen were some FLP (Funny Looking Priors) ... What is the intuition behind the specification of density functions with a somewhat unusual topology?*

Intuitively, the goal in specifying a non–local alternative prior is to find a functional form that is analytically convenient, is zero at all values in the parameter space that are consistent with the null hypothesis, and that has features that facilitate prior specification and interpretation.

For instance, a simple class of non-local alternative prior densities, the MOM priors, can be defined by multiplying an arbitrary density function by a quadratic form. If $\pi_b(\theta)$ denotes a standard normal density function, then $\pi_M(\theta) = \theta^2\,\pi_b(\theta)$ defines a density function that takes the value 0 when $\theta = 0$ and has modes at $\pm\sqrt{2}$. By appropriately centering and rescaling this density, a location–scale class of non–local alternative prior densities is obtained. Members of this class can be selected so as to assign negligible mass to neighborhoods of any point null hypothesis. The locations of the prior modes under the alternative hypothesis are then positioned at δ units from the null value.

8. *The Bayesian literature has seen increased popularity of model selection and exploration procedures, commonly based on local alternative priors. What do you think are the implications of your results for these classes of models?*

Because the use local alternative models prevents the assignment of high posterior probability to the null model (which in the model selection context corresponds to the exclusion of covariates), model selection procedures that utilize such priors inevitably require an additional penalty term to prevent the selection of too many explanatory variables. Unfortunately, such penalty terms also tend to decrease the posterior probability assigned to substantively important covariates. In some sense, the use of typical objective Bayes methods thus provides the worst of both the frequentist and Bayesian worlds: bad sampling properties and ambiguous interpretations of posterior model probabilities.

9. *I often admire the originality your work. This in the sense that, when I read your papers, I can usually picture a Bayesian and a frequentist both shaking their heads in disapproval at the same time. How does a Bayesian learn to be a Bayesian outside the box?*

Thanks. To the extent that my work does fall "outside the box", I suppose it is because I often try to focus on problems that others are not already solving.

Thanks to Val, for taking the time to answer our questions!

Following are are some references to the books and articles mentioned in Val's interview:

- Johnson VE, Albert JH, (1999). Ordinal Data Modeling. (Statistics for Social Science and Public Policy.) New York, NY: Springer–Verlag New York, Inc.
- Johnson VE, (2003). Grade Inflation: A Crisis in College Education. New York, NY: Spring–Verlag New York, Inc.
- Johnson VE, (2008). *Statistical Analysis of the National Institutes of Health peer review system*. PNAS, 105, no. 32, pp.11076-1080.
- Johnson VE and Rossell D, (2008). *Non-local prior densities for default Bayesian hypothesis tests*. Technical Report available online at http://www.bepress.com/mdandersonbiostat/paper42/.

ANNOTATED BIBLIOGRAPHY

Parallel Computing and Bayesian Modeling

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The use of high-performance computing in statistical modeling is becoming more common as the size of data sets and the complexity of data structures increase. Parallel computing – generally, the ability to use several processors simultaneously – has been used in several areas of Bayesian modeling over the past decade or so and continues to gain popularity. Implementations of parallel computing can be as simple as manually running separate processes on separate workstations, and can be as complex as writing programs to run on a distributed computing cluster with several hundred nodes that can communicate with each other. The way in which parallelization is introduced into computational methods is also varied. Some approaches take existing methods and speed them up by parallelizing particular computations, e.g. massive matrix operations, making analysis of large data sets feasible. Other approaches create new algorithms containing inherently parallel components, opening up new classes of computational methods.

The annotated references below represent a survey of some of the ways in which parallel computing has been used in Bayesian modeling. The list is by no means meant to be exhaustive; rather, it is meant to illustrate a variety of parallel computing methods in a variety of research areas. The works are roughly divided into a few categories. The final category, "Software and Computing", is not strictly Bayesian. It contains references to articles describing software for parallel computing and, in particular, methods for parallelizing computation in R, which may be of

interest to those wishing to learn about the basics of parallel computing.

General Methods

- Schervish MJ (1988) Applications of parallel computations to statistical inference. *Journal of the American Statistical Association*, **83**: 976-983.

  A discussion of parallel computing in statistics, primarily focusing on subdividing computational tasks into independent parts that can be run on separate processors. Several examples are provided.

- Rosenthal JS (2000) Parallel computing and Monte Carlo algorithms. *Far East Journal of Theoretical Statistics*, **4**: 207-236.

  The paper argues that parallel computing is especially useful for Monte Carlo calculations, and practical issues related to implementing such methods are considered. Strategies for incorporating parallelization in MCMC methods, including perfect sampling and Metropolis-coupled MCMC, are discussed.

- Wilkinson, DJ (2006) Parallel Bayesian Computation. In *Handbook of Parallel Computing and Statistics*, ed. EJ Kontoghiorghes: 477-508.

  Provides a detailed discussion of parallel computing methods for Bayesian inference. Parallelized random number generation and Monte Carlo simulation are described, as well as various techniques for parallelizing MCMC methods. A case study in parallelizing computation for stochastic volatility models is provided.

- *Handbook of Parallel Computing and Statistics* (2006) Ed. EJ Kontoghiorghes, Chapman & Hall/CRC.

  A general resource for parallel computing methods with a view toward statistical applications. Topics include an introduction to parallel computing, some discussion of parallelized matrix operations, parallel optimization methods and parallelization approaches for several statistical applications.

Spatial Models

- Hoar TJ, Milliff RF, Nychka D, Wikle CK, Berliner LM (2003) Winds from a Bayesian hierarchical model: computation for atmospheric-ocean research. *Journal of Computational and Graphical Statistics*, **12**: 781-807.

  Bayesian hierarchical modeling of large, complex datasets using massively parallel computer architectures is discussed. Implementation issues related to hardware, software and data structures are described, and a spatio-temporal example is used to demonstrate the complexities of transitioning to large-scale parallel implementations.

- Whiley M, Wilson SP (2004) Parallel algorithms for Markov chain Monte Carlo methods in latent spatial Gaussian models. *Statistics and Computing*, **14**: 171-179.

  Four parallel MCMC algorithms for latent spatial Gaussian models are proposed and evaluated. Parallel algorithms for matrix operations and various methods for partitioning spatial locations are considered.

- Haslett J, Whiley M, Bhattacharya S, Salter-Townshend M, Wilson SP, Allen JRM, Huntely B, Mitchell FJG (2006) Bayesian palaeoclimate reconstruction. *Journal of the Royal Statistical Society A*, **169**: 395-438.

  A Bayesian hierarchical model with a spatial component is used to reconstruct prehistoric climates. The computationally intensive approach uses a parallel processing algorithm that exploits Gaussian structure in the model.

- Holloman CH, Lee HKH, Higdon DM (2006) Multiresolution genetic algorithms and Markov chain Monte Carlo. *Journal of Computational and Graphical Statistics*, **15**: 861-879.

  This paper combines multiresolution models with genetic algorithms in order to improve MCMC convergence for complex, high-dimensional spatial models. Within-chain parallelization is employed based on a factorization of the posterior distribution, and multiple MCMC chains at multiple scale resolutions are run in parallel.

- Yan J, Cowles MK, Wang S, Armstrong MP (2007) Parallelizing MCMC for Bayesian

spatiotemporal geostatistical models. *Statistics and Computing*, **17**: 323-335.

This paper considers a parallelization strategy within a single MCMC chain in order to implement reparameterized and marginalized posterior sampling for a Gaussian geostatistical model.

Model Determination

- Dobra A, Hans C, Jones B, Nevins JR, Yao G, West M (2004) Sparse graphical models for exploring gene expression data. *Journal of Multivariate Analysis*, **90**: 196-212.

  A constructive approach for generating large-scale graphical models with sparse structure is introduced. Conditional independence relationships in the model allow for parallel computing methods to be used to determine local structures simultaneously.

- Jones B, Carvalho C, Dobra A, Hans C, Carter C, West M (2005) Experiments in stochastic computation for high-dimensional graphical models. *Statistical Science*, **20**: 388-400.

  Stochastic search methods for exploring sparse Gaussian graphical models are introduced. Parallel computing is used to efficiently determine local graph structure and rapidly guide the search to regions of high posterior probability.

- Hans C, Dobra A, West M (2007) Shotgun stochastic search for "Large p" regression. *Journal of the American Statistical Association*, **102**: 507-516.

  A stochastic search method for implementing Bayesian variable selection and model averaging is introduced. The method uses a cluster to make rapid, parallel, evaluations of models within a neighborhood in order to quickly discover and catalogue high posterior probability regions.

- Dobra A, Massam H (2008) The mode oriented stochastic search (MOSS) algorithm for log-linear models with conjugate priors. Working paper no. 84, Center for Statistics and the Social Sciences, University of Washington.

  Introduces a stochastic search method for decomposable, graphical and hierarchical log-linear models. Parallel computing is used to independently and rapidly evaluate model marginal likelihoods within a neighborhood structure.

Optimization

- Fouskakis D, Draper D (2002) Stochastic Optimization: a review. *International Statistical Review*, **70**: 315-349.

  A review of several stochastic optimization methods. Discusses the parallelizability of simulated annealing, genetic algorithms and tabu search and provides related references.

- Feng X, Buell DA, Rose JR, Waddell PJ (2003) Parallel algorithms for Bayesian phylogenetic inference. *Journal of Parallel and Distributed Computing*, **63**: 707-718.

  Describes a parallelized MCMC approach to finding phylogenies with high posterior probability.

- Gray GA, Martinez-Canales M, Lee HKH, Taddy M, Gramacy RB (2006) Enhancing parallel pattern search optimization with a Gaussian process oracle. *Proceedings of the 14th NEDC.*

  Parallel computing is used in a derivative-free approach to simulation based optimization that uses a global Gaussian process in combination with local optimization methods.

Software and Computing

- Li N, Rossini, AJ (2000) RPVM: Cluster statistical computing in R. *R News*, **1**(3): 4-7.

  RPVM is an R interface to the parallel virtual machine (PVM) application programming interface. PVM was designed to facilitate communication between processors on heterogeneous networks of computers.

- Mascagni M, Srinivasan A (2001) Algorithm 806: SPRNG: A scalable library for pseudorandom number generation. *ACM Transactions on Mathematical Software*, **26**: 436-461. Software available at `http://sprng.cs.fsu.edu`.

SPRNG provides pseudorandom number generators that can be used for Monte Carlo simulations in a parallel computing environment.

- Yu H (2002) Rmpi: parallel statistical computing in R. *R News*, **2**(2): 10-14.

  The R package Rmpi provides an interface between R and MPI, a message passing interface that can be used to control communication between processors in a parallel computing environment.

- Rossini A, Tierney L, Li N (2007) Simple parallel computing in R. *Journal of Computational and Graphical Statistics*, **16**: 399-420.

  Straightforward methods for parallelizing computations in R by distributing computations over a cluster of CPUs are introduced. The framework they describe uses the R package `snow` (simple network of workstations), available from CRAN.

- Tierney, L (2008) Implicit and explicit parallel computing in R. In *Proceedings in Computational Statistics 2008*, ed. P Brito: 43-51.

  Considers both implicit (vectorized arithmetic operations, etc.) and explicit (computations run on several different processors/machines) parallelization strategies with R.

- ScaLAPACK. Available at `http://www.netlib.org/scalapack`.

  Software that extends LAPACK (a linear algebra software package) routines for use on distributed memory computer clusters.

- Message Passing Interface Forum (2008) MPI: A message passing interface standard (version 2.1). Available at `http://www.mpi-forum.org`.

  MPI is a widely-used message passing interface to facilitate communication between processors in a parallel computing environment.

BAYESIAN HISTORY

EVOLUTION OF BAYESIAN STATISTICS IN INDIA

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When my colleague Timothy Johnson asked me if I would be interested to write a short article on the history of Bayesian statistics in India for the ISBA Newsletter, I felt that this will be an opportunity for me as a student of Bayesian statistics to learn about the roots and origin of when and how Bayesian ideas propagated on Indian soil. At the same time, I realized that I know very little about the organization and development that actually happened in India, as opposed to the many contributions that statisticians of Indian origin have made to Bayesian methodology while working and living abroad. This article is exclusively devoted to the work that actually took place in India. Many of the developments I collect here resulted from my communication with Professor Jayanta K. Ghosh of Purdue University, USA and Professor Satyanshu K. Upadhyay of the Banaras Hindu University, India, and I sincerely thank them for their help in the process of writing this article. However, the omissions and errors are entirely mine and I apologize in advance for any important facts, contributions, and events that I have failed to include.

In terms of the early significant contributions by Indian Statisticians to Bayesian theory, Professor Vasant S. Huzurbazar is the first name one would recall. He completed his doctoral work on 'Properties of Sufficient Statistics' under the supervision of Harold Jeffreys at Cambridge and returned to India in 1949. His work on invariance was quite relevant in the understanding of Jeffreys' type of non-informative priors. The significance of his contributions was pointed out by a number of Bayesians; a few such developments are surveyed in [1].

Legendary Professor Debabrata Basu was the first ardent and eminent advocate of Bayesian statistics in India. Basu's deep insight into Neyman-Pearsonian and Fisherian schools of in-

ference and his critical examination of foundational issues eventually led him to a Bayesian point of view, via the likelihood route [2, 3]. In 1968, Basu was invited to give a lecture on Bayesian ideas in the Statistics Section of the Indian Science Congress at Varanasi. According to his own confession, while preparing for this lecture, his conversion became complete. His work has influenced generations of statisticians and has taken him to Universities all over the world, but he always maintained strong ties with the Indian Statistical Institute [ISI], where he had spent many years as a faculty. His collection of essays depicts the gradual process of his conversion from a staunch frequentist to a fervent Bayesian [2].

Basu's endorsement of Bayesian statistics spurred interest among many Indian Statisticians, including Professor Jayanta K Ghosh, who has led the Bayesian movement in India for many years now. At the same 1968 Indian Science Congress, Ghosh spoke on approximation of improper priors by proper priors suggesting that the quality of approximation determined good properties of inference based on the improper priors. Ghosh has pointed out in a personal communication that he remained in the narrow area between likelihood and Bayesian for a long time even after the 1968 congress. He changed over to Bayesian paradigm completely around 1989 and since then has worked on multifarious Bayes problems including both theoretical and applied aspects.

An important event in the advancement of Bayesian philosophy in India was the organization of a Indo-US workshop on Bayesian Analysis in Statistics and Econometrics in 1988 in ISI Bangalore, jointly organized by the National Science Foundation and the ISI [4]. Professors Prem Goel and N. Sreenivas Iyengar took lead roles in organizing this conference with support from many people, of whom Arnold Zellner, Maurice DeGroot and D. Basu deserve special mention. As the Director of ISI and a would-be Bayesian, Ghosh played a major role of a catalyst in making this joint venture possible.

Many next generation Bayesians from Indian institutions attended this conference. Among them Professor Satyanshu K.Upadhyay of Banaras Hindu University (BHU) has taken a leadership role in organizing many Bayesian events in India in subsequent years. Upadhyay's interaction with Ghosh at ISI and Professor Adrian Smith at the Imperial College led him to plan the next Bayesian conference in 1996 at BHU. This event can be considered as another landmark event in the Indian Bayesian scenario. Among the various resolutions that were taken up in this meeting, the important ones included the formation of an informal group of Indian Bayesians, publishing a biannual Bayesian newsletter where people can express their views and work related to Bayesian Statistics, promotion of teaching Bayesian courses in Indian institutions, and organization of conferences/seminars/workshops at regular intervals. The newsletter edited jointly by Upadhyay and Professor Umesh Singh has a regular column titled "From the Desk of Prof. Ghosh" and has successfully completed 12 years of its childhood with contributions from many eminent Bayesians across the globe as well as from India [1, 5, 6].

The announcement of the Indian Chapter of ISBA in the year 1998 was a big achievement for the informal group of Indian Bayesians. ISBA has been a strong supporter of Bayesian enterprises in India. After the BHU conference in 1996, there have been 18 events including training programmes in almost every region of India. The meetings at Amravati (1999), Indian Statistical Institute (2003), BHU (2005), and regular workshops at ISI Bangalore and BHU have inspired many junior researchers and fostered new collaborations. The BHU meeting in 2005 was attended by more than 60 speakers from abroad and more than 150 participants from India. It was an untiring effort of S.K. Upadhyay and his fellow colleagues at BHU that made this meeting a memorable one for many attendees [7].

The Indian Bayesian Society was formally registered in 2003 with Prof. Ghosh as the Founder President. The current President is Prof. A. K. Bansal of Delhi University. The Society has more than hundred devoted life members. Many members of the Indian Bayesian Society have made tireless efforts and contribution since its conception. A few members of the Indian Bayesian community deserve special mention for donating their time for the success of any Bayesian event anywhere in the country: Umesh Singh and S.K. Upadhyay (both from BHU), A.A. Khan (Sher-e-Kashmir University of Agricultural Sciences and Technology), Tapas Samanta and Mohan Delampady (both from ISI), B.K. Kale and

Sudhakar Kunte (both from University of Pune), Kalyan Das (Calcutta University), R.K. Singh (Lucknow University), A. Loganathan (Manonmaniam Sundaranar University).

With the advent of Markov chain Monte Carlo and modern computing platforms, Bayesian Statistics has reached remarkable heights with an expanding coverage of many new areas of applications. The more theoretical study of Bayesian statistics in India has also started changing its face with creation of new research groups emphasizing on cross-fertilization of ideas across different branches of science. A Bayesian and Interdisciplinary Research unit at the ISI has been created. Department of Science and Technology, Government of India, has agreed to fund a Center for Interdisciplinary Research in Mathematical Sciences, at Banaras Hindu University, with Bayesian Statistics as a thrust area. We wish a great success to Indian Bayesians for their mission.

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[2] Basu, D. *Statistical Information and Likelihood: A Collection of Critical Essays*. Springer-Verlag, NY, 1988.

[3] Ghosh, M. and Pathak, P.K. Current Issues in Statistical Inference: Essays in Honor of D. Basu *IMS Lecture Notes Monograph Series*, 17, 1992.

[4] Goel, P.K. and Iyengar, N.S. Bayesian Analysis in Statistics and Econometrics. *Indo-US Workshop on Bayesian Analysis in Statistics and Econometrics*, Springer-Verlag, 1992.

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[6] Upadhyay, S.K. and Singh, U. *Indian Bayesian Society Newsletter* 1 2004.

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SOFTWARE HIGHLIGHT

SHELF: The Sheffield Elicitation Framework

by Anthony O'Hagan and Jeremy Oakley

The SHeffield ELicitation Framework (SHELF) is a package of documents, templates and software to carry out elicitation of probability distributions for uncertain quantities from a group of experts. It has been designed based on our own practical experiences of elicitation, and from an extensive review of both the statistics and psychology literature conducted as part of the project "Bayesian Elicitation of Expert's Probabilities", and reported in [1]. SHELF is available free of charge from

http://www.tonyohagan.co.uk/shelf

Our motivation for developing SHELF came from discussions in the project "Bayesian Analysis in Microbial Risk Assessment", led by Helen Clough at the University of Liverpool and Marc Kennedy at the DEFRA Central Science Laboratory (CSL), and in particular a request from a non-statistician on the project team for practical advice on performing elicitation. Hence SHELF is intended for those who wish to carry out elicitation, but who lack experience or knowledge of how to do it well.

SHELF is designed for eliciting a single distribution from a group of experts using the 'behavioural aggregation' approach, in which the experts are brought together to debate and agree a single 'consensus' distribution that represents the views of the group, in a discussion managed by a *facilitator*. The facilitator is assumed to have sufficient knowledge of statistics in order to conduct the elicitation. (SHELF may also be used for eliciting a distribution from a single expert, with trivial modification of the templates).

A current limitation of SHELF is that it does not include tools for multivariate elicitation, al-

though there is some discussion in the documentation of how parameterisations might be considered in the multivariate case that are both intuitive to the experts and allow independence to be assumed.

Documents and templates

The package contains various documents explaining the use of SHELF, suggested pre-elicitation briefing material to send to the experts, and a set of elicitation templates. We consider the templates to be the most important component of SHELF. They are intended to have two purposes. First, they provide a sequence of steps for the facilitator to follow in order to prepare for and conduct the elicitation session. Second, they form the basis for a record of the elicitation itself. Transparent and detailed reporting of the elicitation process is important, particularly when the elicited distributions will be used for policy decisions affecting a range of stakeholders with competing interests.

The facilitator chooses a particular template to use depending on the group's preference for a specific elicitation method: elicitation of quartiles, tertiles or probabilities. The templates contain a list of headings that either specify a piece of information to be recorded, a task to be performed, or a result to be reported. Two example headings are

1. "Evidence". The facilitator might note any key references considered by the expert group, and assessment of the relevance/importance of the evidence reported within those references.

2. "Upper and Lower Quartiles". Here, the facilitator would record judgements from each expert individually, so that there is a record of what each expert thought prior to any attempt to agree consensus probabilities.

Two versions of each template are included: a blank form, to be used for the elicitation, and a second form with additional comments to advise the facilitator, and explain the rationale for the various tasks and how they contribute to good elicitation.

R functions

The SHELF package contains R functions for fitting distributions to expert judgements, and providing instant feedback. The current version allows the facilitator to fit beta, lognormal and gamma distributions to either probability or quantile judgements. Parameter values for these distributions are obtained by numerically minimising squared differences between the elicited probabilities and the corresponding fitted probabilities.

The facilitator first specifies whether the parameter of interest is an uncertain proportion (or other variable constrained to be between 0 and 1), or a positive variable requiring a skewed distribution. In the latter case, results of both lognormal and gamma fits are reported simultaneously. Judgements from each expert are specified, and individual density functions are fitted and plotted, to draw attention to any disagreements between the experts. An equal-weighted linear pool is computed, but not reported at this stage. The linear pool is suggested as a convenient means of choosing a consensus distribution if the experts' individual judgements are very similar. (This stage is skipped if eliciting from one expert only).

Following group discussion, the facilitator specifies a single set of consensus quantiles or probabilities. A density is then fitted and plotted, with additional summaries reported from the fitted distribution as feedback, together with the linear pool for comparison. The elicited consensus judgments may be modified and a new density fitted as required.

Feedback

We are keen to receive feedback from users of SHELF (and to see more people do elicitation!) We would particularly welcome offers of additional materials or suggested amendments to components of SHELF. Comments can be emailed to us at `shelf@tonyohagan.co.uk` and `j.oakley@sheffield.ac.uk`. We intend SHELF to be a growing and open resource for anyone wishing to conduct effective elicitation.

References

[1] O'Hagan, A., Buck, C. E., Daneshkhah, A., Eiser, J. R., Garthwaite, P. H., Jenkinson, D., Oakley, J. E. & Rakow, T. (2006). *Uncertain Judgements: Eliciting Experts' Probabilities*, Chichester: Wiley.

STUDENTS' CORNER

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This quarter we present dissertation abstracts from two recent graduates who are currently pursuing post-doctoral work at SAMSI. If you (or your student) is a recent graduate, or you have an idea for an article that may be of interest to graduate students in the field of Bayesian statistics, I'd love to hear from you.

Dissertation Abstracts

A Bayesian approach to Nested Clade Analysis

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The purpose of this study is to identify genetically distinct clusters of individuals based on related characteristic traits (namely phenotypic data) or geographical locations (namely phylogeographic data). There are 2 main steps to this process: inferring the genetic history of the sequences under study, and subsequently identifying significant clusters according to the phenotypic/phylogeographic measurements. Based on an evolutionary model and an appropriate model for the distribution of the phenotype, such inference is possible in a number of different ways. However, due to the multiple level uncertainty and the complexity of the models, it is essential that the methods avoid stepwise optimization in order to give statistically reliable conclusions.

The main methods currently used for analysis of this type are called Nested Clade Analysis (NCA) and Nested Clade Phylogeographic Analysis (NCPA) for phenotypic and phylogeographic data respectively. In short, they rely on finding the optimal genetic history based on a simplified evolutionary model, and identifying significantly different clusters for the phenotype/geography (assuming the inferred genetic history as fixed) by using Nested Analysis of Variance and permutation tests. Such methods do not allow for the uncertainty of each step to fully propagate through the model and have been shown by simulations often to lead to false conclusions.

Here we describe a coherent statistical framework for NCA/NCPA by taking a (Reversible Jump) Markov chain Monte Carlo approach to the genetic clustering problem. By considering a general evolutionary model and clustering constructions using haplotype trees for the phenotypic and phylogeographic analysis respectively, we construct a holistic method in order to obtain the global optimum of the parameters of interest.

Several challenges arise in this process. The presence of homoplasy (representing convergent evolution, usually through back mutations) can obscure the analysis, increasing the number of possible histories that underly the data. This leads to intractable likelihoods and normalisation constants. Here we use Approximate Bayesian Computation to address these issues. In addition, the parameter space of clusterings is vast, so we employ adaptive methods and efficient proposals to ensure mixing and convergence. Lastly, we address inherent issues of similar clustering and phylogenetic inference problems such as label-switching (for the cluster parameters) and representation of trees (essential for convergence assessment). We implement our method for 3 datasets and discuss the results in relation to NCA and NCPA.

Generalized Linear Models and Beyond: An Innovative Approach from Bayesian Perspective

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In this dissertation we develop an innovative approach to analyze the scientific studies using the *generalized linear models* (GLM) and beyond. We develop the regression estimator, a new algorithm for fitting GLM and different

model diagnostic technique for GLM. In the context of the longitudinal study, we present the Bayesian analysis of the generalized multivariate gamma distribution for the generalized multivariate analysis of variance (GMANOVA) model. We demonstrate the method for modeling longitudinal studies as state space dynamic model. We accomplish this by introducing the *power filter* for dynamic generalized linear models (DGLM). An information processing optimality property of the power filter is presented and we establish the relationship between the Kalman filter and the power filter as well. We develop the Pareto regression model for analyzing the extreme drinking behavior of the alcohol dependence disorder patients.

NEWS FROM THE WORLD

Events

2007 Savage Award Winners

Congratulations to the winners of the 2007 Savage award, awarded to two outstanding doctoral dissertations in Bayesian econometrics and statistics. The *Theory and Methods* award went to Kostas Kalogeropoulos, Department of Engineering, University of Cambridge, for his dissertation "Bayesian Inference for Multidimensional Diffusion Processes". The *Applied Methodology* award went to Vladimir Minin, Deptartment of Statistics, University of Washington, for his dissertation "Exploring Evolutionary Heterogeneity with Change-Point Models, Gaussian Markov Random Fields, and Markov Chain Induced Counting Processes."

2009 Bayesian Biostatistics, Houston, Texas, 26-28th Jan. 2009.

Current and prospective users of Bayesian biostatistics are invited to join experts in the field for a three-day conference sponsored by the Department of Biostatistics at The University of Texas M. D. Anderson Cancer Center in Houston, Texas, USA. Attendees will have the opportunity to attend two courses on the first day of the conference (Monday). The Use of Bayesian Statistics in Clinical Trials, and Applications of Bayesian Methods to Drug and Medical Device Development. On Tuesday and Wednesday, invited presentations will cover a variety of topics, possibly including comprehensive decision modeling; prior distributions in clinical studies and drug development; what Bayesian methods can provide that traditional methods cannot provide; Bayesian methods in medical journals; Bayesian methods in epidemiology; Bayesian methods and medical ethics; how to build a cadre of Bayesian experts; why Bayesian methods are not more widely used; how to assure good quality in Bayesian methods; and guidelines for publishing Bayesian analyses.

$500 travel grants will be awarded to qualifying pre-doctoral students (post-docs are not eligible for this grant). For more information visit the website, http://www.mdanderson.org/departments/biostats/, or contact Lydia Davis *lbdavis@mdanderson.org*.

Call for the 2008 Toby J. Mitchell Prize

The Prize Committee of ISBA is pleased to announce the Mitchell Prize in recognition of an outstanding paper that describes how a Bayesian analysis has solved an important applied problem. For details on the Mitchell Prize, including names of past winners, eligibility details, and the on-line application procedure, please visit:

http://www.bayesian.org/awards/MitchellPrize.html

The deadline for submission is December 31, 2008.

Marina Vannucci (Chair, ISBA Prize Committee)

7th Workshop on Bayesian Inference in Stochastic Processes, Bressanone/Brixen, Italy, 18-20th Jun. 2009.

In this workshop, we will bring together experts in the field to review, discuss and explore directions of development of Bayesian Inference

in Stochastic Processes and in the use of Stochastic Processes for Bayesian Inference. There will be sessions on Markov processes, state-space models, spatial, empirical, birth-death and branching processes. Theoretical and applied contributions (for example queueing, population modelling, signal processing) are both welcome. The workshop will thus be of interest to workers in both Bayesian Inference and Stochastic Processes. For more information visit the website, http://www.mi.imati.cnr.it/conferences/bisp6.html.

6th Workshop on Bayesian Nonparametrics, Moncalieri (Turin), Italy, 21-25th Jun. 2009.

The aim of the 7th Workshop on Bayesian Nonparametrics is to highlight the latest developments in Bayesian Nonparametrics covering a wide variety of both theoretical and applied topics. The meeting will be held at the Collegio Carlo Alberto, a Research Institution housed in an historical building located in Moncalieri on the outskirts of Turin, Italy. For more information visit the website, http://bnpworkshop.carloalberto.org, or contact Pierpaolo De Blasi *bnp@carloalberto.org*.

O-Bayes09, University of Pennsylvania, Philadelphia, 6-9th Jun. 2009.

O-Bayes09, the 2009 International Workshop on Objective Bayes Methodology will take place at the Wharton School of the University of Pennsylvania, Philadelphia, PA, USA. The principal objectives of O-Bayes09 are to facilitate the exchange of recent research developments in objective Bayes methodology, to provide opportunities for new researchers to shine, and to establish new collaborations and partnerships that will channel efforts into pending problems and open new directions for further study. O-Bayes09 will also serve to further crystallize objective Bayes methodology as an established area for statistical research.

The workshop will consist of a series of invited talks followed by discussion and one or more sessions dedicated to contributed posters.For more information visit the website, http://stat.wharton.upenn.edu/statweb/Conference/OBayes09/OBayes.html, or contact Linda Zhao *lzhao@wharton.upenn.edu*.

The great'08 Pascal challenge

In order to make advances in the processing of their datasets and in the understanding of the fundamental parameters driving the general relativity model, cosmologists are launching a competition called the great'08 challenge http://www.great08challenge.info/ through the Pascal European network. The details about the challenge are available on the http://www.great08challenge.info/GREAT08_Challenge_Documentv2.pdf document, the model being clearly defined from a statistical point of view as a combination of lensing shear (the phenomenon of interest) and of various convolution noises that make the analysis so challenging. The solution must be efficient too in that it is to be tested on 27 million galaxies! A standard MCMC mixture analysis on each galaxy is thus unlikely to converge before the challenge is over, next April. I think the challenge is worth considering by statistical teams, even though this represents a considerable involvement over the next six months.

Report on the 9th Brazilian Bayesian Meeting

by Marárcia Branco
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The 9th Brazilian Bayesian Meeting was held in Maresias Beach Hotel on the coast of São Paulo State. The meeting was organized by the Brazilian Bayesian Chapter (ISBrA), with the following scientific committee: Alexandra M. Schmidt (UFRJ) Heleno Bolfarine (USP), Josemar Rodrigues (UFSCar), Márcia Branco (USP), Peter Muller (M. D. Anderson Cancer Center, Texas), Reinaldo Arellano (PUC, Santiago) and Rosangela Loschi (UFMG).

A total of 131 participants attended the meeting including researchers from Brazil (47), the United States (6), Chile (5), France, Italy, Switzerland, Belgium, Canada and Colombia. It also

had the participation of 67 students from many universities around Brazil.

Besides the diversity of accents, the 9th EBEB (Encontro Brasileiro de Estatistica Bayesiana) was also characterized by a wide range of themes that include foundations and applications, parametric, nonparametric, spatial, temporal and skewed models. The following talks were presented:

Telba Irony (FDA-USA)
The Bayesian framework at the Center for Devices at the FDA.

Carlos Alberto de Braganca Pereira (USP-SP)
P-value versus e-value: Can they be equivalent?

Peter Muller (University of Texas M. D. Anderson Cancer Center)
The Optimal Discovery Procedure and Bayesian Decision Rules.

Ram Tiwari (National Cancer Institute)
Prediction of U.S. Mortality Counts Using Semiparametric Bayesian Techniques.

Renato Assuncão (UFMG)
Spatial Clustering of Small Areas with Bayesian Methods.

Marina Vannucci (Rice University)
Bayesian Methods for Genomics.

Sonia Petrone (Università Bocconi di Milano)
Bayesian nonparametric mixtures for local clustering of functional data.

Michel Mouchart (Université Catholique de Louvain)
Testing the normality of the latent variables in the polychoric correlation Model.

Christian Robert (Université Paris-Dauphine)
Adaptive Importance Sampling in General Mixture Classes.

Dani Gamerman (UFRJ)
Variáveis latentes para dados binários.

Fernando Moala (UNESP)
Elicitation of Multivariate Prior Distributions: A nonparametric Bayesian approach.

Vera Tomazella (UFSCar)
Objective Bayesian Reference Analysis for the Hardy-Weinberg Equilibrium.

Victor Lachos (UNICAMP)
Bayesian Inference for Multivariate Skew-Normal/Independent Regression Models.

It was also part of the scientific programme the short course "Modern Bayesian Econometrics" presented by Hedibert Lopes (Graduate School of Business, University of Chicago), two sessions with orally contributed papers (8 in the total) and two poster sessions (with 77 contributed papers). Four posters were selected as the best student presentation. In alphabetic order, the winners were: Edna Afonso Reis, UFRJ, (Modelo Espaco-Temporais Dinamicos em Processos Pontuais), Esther Salazar, UFRJ, (Modelo Fatorial Espacial Dinamico), Max Sousa de Lima, UFMG, (Um método Bayesiano para selecão de janela ótima em estimacõ de densidades multivariados) and Rafael Bráz Azevedo Farias, USP, (Algoritmos eficientes em regressão binária bayesiana com ligacão probito-assimétrica). The selected students received a prize in money and a book which were kindly donated by Christian Robert, Hedibert Lopes, Marc Genton and Carlos Carvalho.

There were two very special sessions. The first was organized in honor of Carlos Alberto de Braganca Pereira as a way to acknowledge his important contributions for the Brazilian Bayesian community. It was coordinated by Telba Irony (FDA, USA). Professors Carlos Alberto Barbosa Dantas (USP), Julio Stern (USP) and Basilio de Braganca Pereira (UFRJ) shared with us moments of Carlinhos' professional and personal life. The second was organized by Reinaldo Arellano Valle (PUC, Chile) in memory of Pilar Iglesias. Reinaldo started reading a touch text about her, then the session following with talks from some Pilar's co-authors: Fernando Quintana, PUC-Chile, (Collaborative Work with Pilar Iglesias: An Overview), Ign/'acio Vidal, Un. de Talca, (Bayesian inference for dependent elliptical measurement error models) and Sergio Wechsler, USP-SP, (De Finettian Pilar).

The coordinators of the 9th EBEB thank all who attended the meeting for their scientific contributions and enthusiastic participation.