THE ISBA BULLETIN

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A MESSAGE FROM THE PRESIDENT

- Fabrizio Ruggeri -
ISBA President, 2012
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The last three months have seen a lot of exciting news at ISBA and I would like to share them with you.

- Young Bayesians (Y-ISBA)

ISBA has always been supportive of students and young researchers through awards and travel grants but now we would like to take a step further, increasing their involvement in the society activities. Like other statistical societies, ISBA is planning to have a group (possibly a formal Section) made of young Bayesians who might organise their own meetings, sessions at ISBA meetings, use social networks to communicate, etc. Since many young Bayesians will attend ISBA 2012, we have invited three of them (Andrew Cron, Duke, USA, andrew.j.cron@gmail.com; Marian Farah, Cambridge, UK, marian.farah@mrc-bsu.cam.ac.uk; Francesca Ieva, Milano, Italy, francesca.ieva@mail.polimi.it) to prepare and lead a discussion scheduled for 28/6 at 12:30 - 14:00 in Kyoto. I invite to contact Andrew, Marian and Francesca and tell them what you think Y-ISBA should do.

- ISBA as a new JSM partner (from 2013)

Thanks to an action started during Mike Jordan's presidency, ISBA has been recognised as JSM (Joint Statistical Meetings) partner, like the Chinese, Indian and Korean international statistical societies and the five original ones (ASA, ENAR, IMS, SCC, WNAR). It is a great honour for ISBA to be involved in the largest yearly statistical gathering worldwide. ISBA members will be entitled (from 2013) to reduced registration fees.

- ISBA 2012

We are expecting a quite large number of participants and this is the result of the hard work of the Japanese organisers, the ISBA Programme Committee (especially Igor Pruenster), those who got a generous support from sponsoring agencies and, last but not least, the Scientific Committee which is responsible for a high quality programme. . . . *Continued on page 2.*

In this issue

MESSAGE FROM THE PRESIDENT, *Continued from page 1.* ...If you have not made yet your mind about attending ISBA 2012, please consider carefully what you could miss by giving a look at http://www2.e.u-tokyo.ac.jp/∼isba2012/isba2012_program.pdf

- New ISBA Sections

Interaction with researchers in other fields has always been an ISBA goal and I am very glad to report that three new sections, currently under discussion, are aimed in that direction. The three sections (which should be added to Bayesian Nonparametrics and Objective Bayes ones) are:

* *Finance and Business* (FaB), proposed by Mike West [the proposal, properly prepared and signed by 30 members as requested by ISBA policy, will be submitted soon to the ISBA Board for approval]

* *Industry*: Refik Soyer and Nozer Singpurwalla will start soon the procedure

* *Biostatistics*: Telba Irony will start soon the procedure

Other new sections are welcome: if anyone is interested in proposing one, please have a look at http://bayesian.org/sections/new-section-policy for the ISBA policy.

- Bayesian Analysis

The ISBA journal recently ranked 10th on 5-year Impact Factor among statistical journals and it is considered by the ISBA Executive committee as one of the major contributions of ISBA to the statistical community. The ISBA Exec thinks it is worth investing on it to ensure more efficient paper submission/handling and easier access to published issues in a more visible framework. The current system has been created "in-house", mostly by Rob Kass and Pantelis Vlachos at CMU (with later contributions by the *Editors-in-Chief* Brad Carlin and Herbie Lee), and we are very grateful to them and CMU for the support so far. We have been exploring various (open access!) possibilities and, in particular, we are now going to test how BA would be handled within the EJMS submission system, which is used by the IMS and others, and how its issues would be published within Project Euclid. The move has a cost, and we do not want to change our policy of no cost for both authors and readers. Therefore, the ISBA Exec is preparing a financial plan about costs and ways to cover them over a long period. Financial and editorial aspects will be discussed, in cooperation with BA Editors, within the ISBA Board and I hope a decision will be taken in the next few months, at the same time in which a new Editor will be appointed for 2013-15. To sustain the costs, we are thinking of voluntary page charges to reduce costs and actions to increase the number of ISBA members and, therefore, its revenues.

- Meetings

The Chilean and Brazilian chapters of ISBA just organised COBAL in Chile and EBEB in Brazil, whereas the Indian chapter is planning a meeting in Varanasi in January. The South African chapter is seriously thinking about a meeting by end of June 2013, whereas I am discussing with friends in Northern Africa about a Bayesian event in 2013, possibly in Algeria. ISBA will be involved in the Stochastic Processes and Their Applications conference in Colorado, USA, in 2013. Quite a lot of Bayesian talks, including a special session on 250th anniversary of Bayes Theorem, are expected at the European Meeting of Statisticians in July 2013 in Budapest, Hungary. In 2013 there will be also the workshops of our existing sections, Objective Bayes (Duke, USA) and Bayesian Nonparametrics (the Netherlands), and, maybe, of some new section, besides other workshop usually endorsed by ISBA, like "my" Bayesian Inference in Stochastic Processes in Italy. Finally, we are thinking of having a regional North American Bayesian meeting every other year, starting from 2013 (more details next time).

- Latin America summer school

Starting from June 2013, ISBA will sponsor a summer school, to be held every year or every other year in a different country in Latin America. The first school will be in Medellin, Colombia, before an international symposium and the following one should be in 2014 in Costa Rica. The idea is of bringing a leading Bayesian statistician for a week before or after an international conference so that students can not only learn from him/her but also create relationships among young Bayesians which could strengthen the Bayesian network in Latin America. This is

also a first step in the ISBA policy of promoting courses at each Bayesian meeting.

- Video

In Kyoto the "ISBA lectures on Bayesian foundations" given by Berry, Robert, van der Vaart and West will be videotaped. At the same time, we are looking for other videos of interest for Bayesians and studying solutions on how to present them on the ISBA website. You will hear more about this in the near future.

- Fundraising and finance

Since the "exciting news" I have been mentioning so far have a cost (and I have not cited our awards this time), we are working to increase ISBA incomes, through a more profitable investment of money with the help of the new Finance Committee and fundraising campaigns. I take now the opportunity to invite all of you to contribute to any of the funds ISBA maintains (Savage, DeGroot, Lindley, Mitchell, Iglesias) and contact colleagues and friends to become ISBA members. As a consequence of the financial crisis on interest rates, revenues from the endowments sustaining the awards have been affected and we are now evaluating more profitable investments and actions which could guarantee sufficient funds for the awards over a long term. At the same time, we are working to increase individual members and we are discussing details of the possible introduction of institutional membership for departments and companies.

- ISBA series of books

We discussed about the possibility of having a series of edited volumes (2-3 per year) on "hot topics" with revenues given to ISBA and we got 2 proposals by leading publishers. After a thorough discussion, the ISBA Board decided that it would have been quite difficult to ensure such a number of high quality volumes and that it would have been better having special issues of Bayesian Analysis on "hot topics".

- Internal (?) matters

Although they might have not a direct impact on ISBA members, there are other relevant activities: we are going to appoint a Nominations Committee, an Editor Search Committee to suggest names for BA, Bulletin and website editors for the next 3 years, whereas we appointed an ad hoc committee on chapters to determine bylaws and practice in the relation between ISBA and its chapters (with the goal also to increase their number in a near future). We are also working to improve ISBA relations with other societies and groups, like SBSS (the Bayesian section of the American Statistical Society).

If you have comments and ideas, please write to me at fabrizio@mi.imati.cnr.it. ▲

A MESSAGE FROM THE EDITOR

- Manuel Mendoza -
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With this issue of the Bulletin, we welcome Fabrizio Ruggeri as 2012 ISBA President. As far as we can see, this will be a year full of activity and new initiatives and our President's MESSAGE reflects this in a very clear way. Also, in this issue we welcome Isadora Antoniano and Antonio Ortiz as Associate Co-Editors of the Students' Corner Section. They will continue the work with the panel of experts as originally designed by Luke Born and surely they will develop other initiatives of their own. I would like to express my gratitude to Luke for his terrific work as Associate Editor of the Section. He made a superb job. Other new Associate Editor, Francisco Torres, will be in charge of the Software Highlight Section. In this issue he presents an article by Jorge Luis Bazán on a piece of software for the Bayesian analysis of Item Response Models. Francisco takes the office after a wonderful predecessor. Alex Lewin made a invaluable contribution to the Bulletin with a series of interesting and timely articles which, I am sure, have been not only highly informative but readily useful for many of us. I thank Alex for her work. In a different direction, an invited (and provocative) contribution by Larry Wasserman, critically discusses the process of peer rewiew used by scientific publications.

In addition to this, you will find many other pieces of useful information concerning our So-

ciety. I hope you will find this bulletin interesting. As always, I want to encourage all members of ISBA to contribute to the Bulletin with their suggestions, manuscripts and announcements. Please do not hesitate to contact me or any member of the Editorial Board. ▲

FROM THE PROGRAM COUNCIL

ISBA 2012

- Vanja Dukic, Igor Pruenster & Alex Schmidt -
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As many of you know, the ISBA 2012 World Meeting - the premier conference of the International Society for Bayesian Analysis (ISBA) - will be held in Kyoto, Japan, from June 25 to June 29, 2012. The program can be found at http://www2.e.u-tokyo.ac.jp/~isba2012/.

First of all, the ISBA Program Council would like to thank all of you for volunteering to help put together a fantastic lineup of talks and lectures. We have a set of 4 ISBA tutorial lectures on Bayesian foundations, 5 keynote lectures, 21 invited sessions, 34 special topic sessions, and 270 posters.

We estimate that over 500 participants will be present, which is a remarkable success for the Bayesian profession! Given that ISBA 2008 in Australia had 280 participants, we thought that 300 would have been a good result, and 400 a success. We went way beyond our initial projections, and we thank all of you who got involved to help this meeting be such a success.

The quality of talks and posters is exceptionally good this year - you'll find a quick overview of the program in the table at the end of this issue.

When we first started fund raising for the meeting a year ago, we were met with all sorts of negative news: Japan was hit by a terrible earthquake, many US agencies could not support overseas conferences due to budget constraints, and those that could had less support to offer than previously. In spite of all the hardship however, we were able to raise approximately $80,000. We are indebted to the generous support of our colleagues at ASA-SBSS, Google, Microsoft Research, NSF, Pascal 2, Collegio Carlo Alberto, Japanese Ministry of Education, Science, Sports, Culture and Technology, Japan Society for the Promotion of Science - and of course to ISBA itself (ISBA General, Lifetime Membership, and Pilar Iglesias Funds).

We also wish to extend our sincere thanks to all our invited speakers. It is a remarkable tribute to being a Bayesian that not a single one of our invited speakers requested financial support. That has allowed us to direct all our funds to supporting our junior colleagues and students. In the end, we were able to issue 162 travel awards to a very diverse group of junior applicants, from all over the world: 3 from Africa, 8 from Asia, 60 from Europe, 1 from Latin America, 79 from

North America, and 11 from Oceania.

Finally, we couldn't have been this successful without all the hard work of our ISBA Executive Board and Program Committee, as well as our Japanese local organizing committee. All deserve a great big THANK YOU. We hope to see you all in Japan! With best wishes,

Vanja, Igor and Alex. ▲

FROM THE BOARD OF DIRECTORS

ISBA is very interested in promoting activities involving students and young researchers, such as creating a section (say Y-ISBA) organized by young Bayesians, with officers, a website, and planned activities. Due to the unprecedented number of young Bayesians attending the conference in Kyoto, an initial discussion on Y-ISBA will be held. To organize this discussion, the ISBA board invited three young Bayesians to lead it: Andrew Cron (andrew.j.cron@gmail.com, Duke, USA), Marian Farah (marian.farah@mrc-bsu.cam.ac.uk, Cambridge, UK) and Francesca Ieva (francesca.ieva@mail.polimi.it, Milano, Italy). They agreed to 1) collect input from young Bayesians before Kyoto and 2) lead the discussion planned for Wednesday 27th June 12:30-14:00 at Kyoto Terrsa Hall (the major conference hall). They welcome ideas and suggestions by all the students and young researchers who want to contribute to this discussion, even if they are not coming to Kyoto. Please e-mail Andrew, Marian and Francesca with ideas by the end of May then come and discuss them in Kyoto. We look forward to seeing you there. ▲

ISBA AWARDS

2012 ISBA Prizes & Awards

- Merlise Clyde -
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The Prize Committee of ISBA is pleased to announce the 2012 Lindley Prize, Mitchell Prize and Savage Awards.

The 2012 Lindley Prize will be awarded for innovative research in Bayesian statistics that is accepted for publication in the refereed proceedings of the 2012 ISBA World Meeting in Kyoto; all accepted papers will be published in a special issue of Bayesian Analysis. The prize includes a check for $1000 and a plaque with the winner(s) announced at the ISBA World Meeting in 2014. For details on the Lindley Prize, including names of past winners, eligibility, and submission information, please visit Lindley Prize.

The Mitchell Prize is given in recognition of an outstanding paper that describes how a Bayesian analysis has solved an important applied problem. The prize includes a check for $1000 and a plaque; the winner(s) will be announced at the Joint Statistics Meeting in Montreal, CA in 2013. For details on the Mitchell Prize, including names of past winners, eligibility details, and the on-line application procedure, please visit Mitchell Prize.The deadline for submissions is May 31, 2012.

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, one each in Theory & Methods and Applied Methodology. Up to two awards of $750 will be awarded. Finalists will be notified in mid December and invited to present their dissertation research at a special contributed session at the Joint Statistics Meeting in Montreal in 2013 with the winners announced at the Joint Statistics Meeting in Montreal, CA in 2013. For details on the Savage Award, including

names of past winners, eligibility details, and the on-line application procedure, please visit Savage Award. The deadline for submissions is May 31, 2012.

Nominations for the Mitchell and Savage Award may be made by any ISBA or SBSS member. To join ISBA please go to ISBA. Questions regarding any of the Prizes or Awards may be sent to the ISBA Prize Committee at awards@bayesian.org. ▲

BAYESIAN ANALYSIS - A MESSAGE FROM THE EDITOR

UPDATE FROM BA

- Herbie Lee -
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In 2011, Bayesian Analysis saw a continued stream of excellent submissions. Of the 2011 submissions, just one is still under review as of mid-March, and the median time for completion of first review of the rest was 61 days. Overall we are reviewing submissions in a timely manner, with 80% of submissions returned to authors within three months. We are looking forward to another great year in 2012 and welcome your submissions, including papers from the upcoming ISBA 2012 conference in Kyoto.

The March issue of BA features a paper on theoretical aspects of Bayesian prediction by Alessio Sancetta. Under certain conditions, universality properties can be proved for predictions. Additional perspective appears in discussions by Bertrand Clarke and Feng Liang. This issue also contains other fine articles in nonparametrics, semiparametrics, and model selection. ▲

ISBA - SECTIONS

NONPARAMETRIC BAYES SECTION

- Stephen G. Walker -
Chair
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Welcome to the Bayesian Nonparametric corner of the ISBA bulletin. A couple of directions to point in: one is my recent discovery of the academic video lecture, (good news for the pteromerhanophobics) of which there are a number of presentations in Bayesian nonparametrics, mostly by our machine learning colleagues. These are good viewing and one recent set, which is worth a look, is from the Hope or Hype conference, videos.

There are many Bayesian nonparametric sessions in many of the top conferences world wide these days, and some with multiple sessions, the recent ERCIM meeting in London, for example. But special attention needs to be made for the 9th BNP Meeting in 2013 (June 10 to 14) in Amsterdam. There is a web site, but more a date for the diaries at this stage. ▲

INVITED CONTRIBUTION

A World Without Referees

- Larry Waserman -
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- Introduction

The peer review system that we use was invented by Henry Oldenburg, the first editor of the Philosophical Transactions of the Royal Society, in 1665 (see http://en.wikipedia.org/wiki/Peer_review). We are using a refereeing system that is almost 350 years old. If we used the same printing methods as we did in 1665 it would be considered laughable. And yet few question our ancient refereeing process.

- The Problem with Peer Review

The refereeing process is very noisy, time consuming and arbitrary. We should be disseminating our research as widely as possible. Instead, we let two or three referees stand in between our work and the rest of our field. I think that most people are so used to our system, that they refexively defend it when it is criticized. The purpose of doing research is to create new knowledge. This knowledge is useless unless it is disseminated. Refereeing is an impediment to dissemination.

Every experienced researcher that I know has many stories about having papers rejected because of unfair referee reports. Some of this can be written of as sour grapes, but not all of it. In the last 24 years I have been an author, referee, associate editor and editor. I have seen many cases where one referee rejected a paper and another equally qualifed referee accepted it. I am quite sure that if I had sent the paper to two other referees, anything could have happened. Referee reports are strongly affected by the personality, mood and disposition of the referee. Is it fair that you work hard on something for two years only to have it casually dismissed by a couple of people who might happen to be in a bad mood or who feel they have to be critical for the sake of being critical?

Some will argue that refereeing provides quality control. This is an illusion. Plenty of bad papers get published and plenty of good papers get rejected. Many think that the stamp of approval by having a paper accepted by the refereeing process is crucial for maintaining the integrity of the field. This attitude treats a field as if it is a priesthood with a set of infallible, wise elders deciding what is good and what is bad. It is also like a guild, which protects itself by making it harder for outsiders to compete with insiders.

We should think about our field like a marketplace of ideas. Everyone should be free to put their ideas out there. There is no need for referees. Good ideas will get recognized, used and cited. Bad ideas will be ignored. This process will be imperfect. But is it really better to have two or three people decide the fate of your work?

Imagine a world without refereeing. Imagine the time and money saved by not having journals, by not having editors, associated editors and imagine never having to referee a paper again. It's easy if you try.

- A World Without Referees

Young statisticians (and some of us not so young ones) put our papers on the preprint server arXiv (www.arXiv.org). This is the best and easiest way to disseminate research. If you don't check arXiv for new papers every day, then you are really missing out. So, a simple idea is just to post your papers on arxiv. If the paper is good, people will read it. If they find mistakes, you can thank them a post a revision. Pretty simple.

Walter Noll is a Professor Mathematics at Carnegie Mellon. He suggests that we all just post our papers on our own websites. Here is a quote from his paper *The Future of Scientifc Publication* (see http://www.math.cmu.edu/∼wn0g):

- Every author should put an invitation like the following on his or her website: Any comments, reviews, critiques, or objections are invited and should be sent to the author by e-mail. (I have this on my website.) The author should reply to any response and initiate a discussion.

- Every author should notify his or her worldwide colleagues as soon as a new pa-

per has been published on the website.

- The traditional review journals (e.g. Mathematical reviews and Zentralblatt), or perhaps a new online journal, should invite the appropriate public to submit reviews, counter-reviews, and discussions of papers on websites and publish them with only minor editing.
- Promotion committees in universities should give credit to faculty members for writing reviews.

- Questions and Answers

Question: Won't we be deluged by papers? I rely on referees to filter out the bad papers.
Answer: I hope we are deluged with papers. That would be great. But I doubt it will be a problem. Math and Physics, who rely heavily on the arXiv model, have done just fine. If you rely on referees to filter papers for you then I think you are making a huge error. Do you really want referees deciding what papers you get to read? Would like two referees to decide what wines can be sold at the winestore? Isn't the overwhelming selection of wine a positive rather than a negative? Wouldn't you prefer having a wide selection so you can decide yourself? Do you really want your choices limited by others? Anyway, if there does end up being a flood of papers then smart, enterprising people will respond by creating websites and blogs that tell you what's out there, review papers, etc. That's a much more open, democratic approach.

Question: What is the role of journals in a world without referees?
Answer: The same as the role of punch cards.

Question: How about grants?
Answer: I think we still do need referees here. (Although flying 20 people to Washington for a panel review is ludicrous and unnecessary, but that's another story.)

Question: How about bad papers?
Answer: Ignore them or critique them. But don't suppress them.

Question: How about promotion cases?
Answer: Every promotion case includes a few letter writers who know the area and will be able to write substantial letters. They don't need the approval of a journal to tell them whether the papers are good. But there will also be some letter writers who are less familiar with the candidate or the field. Sometimes these people just count papers in big journals. But you can always just look at their CV and quickly peruse a few of the candidate's papers. That doesn't take much time and is certainly no worse than paper counting.

Question: How about medical research?
Answer: There is arguably danger in bad medical papers. But again, I think the answer is to critique rather than suppress. However, I am mainly focusing on areas I am more familiar with, like statistics, computer science etc.

- Conclusion

When I criticize the peer review process I find that people are quick to agree with me. But when I suggest getting rid of it, I usually find that people rush to defend it. Is it because the system is good or is it because we are so used to it that we just assume it has to be this way? In three years we will reach the 350th birthday of the peer review system. Let's hope we can come up with better ideas before then. At the very least we can have a discussion about it.

Thanks to Cosma Shalizi, Mladen Kolar, Sivaraman Balakrishnan, Alessandro Rinaldo, Aarti Singh, Isa Verdinelli and Jamie Robins for comments.

SOFTWARE HIGHLIGHT

ITEM RESPONSE THEORY IN WINBUGS USING *BayesianModeling* SOFTWARE

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Bayesian methods have become popular in social sciences, health sciences, education and psychology due to its flexibility in accommodating numerous models for different situations in data analysis. This is the case of Item Response Theory (IRT). IRT models are used to model multivariate dichotomous responses resulting from n individuals, evaluated in a test with k items. This class of models consider a unidimensional latent variable θ associated to individual abilities and a set of parameters associated with the items which are related with the probability that the i-*th* examinee is able to answer the j-*th* item correctly.

It is common to use Markov chain Monte Carlo (MCMC) techniques for estimating IRT models from a Bayesian approach ([5]). MCMC methods offer many advantages, including its easy implementation and the availability of free software. In contrast, MCMC algorithms can be quite sophisticated, and their proper use require careful attention to several facets of implementation, for example, a heavy computational demand ([6]).

However, the use of BUGS software to estimate IRT models allows to alter existing code in order to fit new variations of current models, which cannot be fitted in the main software packages. For example, traditional IRT models have as assumption that probability of correct response of a person to an item can be linked considering symmetric link functions as logit and probit, however, alternative models with asymmetric links have been proposed recently. Thus, traditional and new models can easily be accommodated by small changes to existing BUGS code.

In this article we show the *BayesianModeling* software ([2]) to generate syntax of several IRT models under a Bayesian approach, using MCMC methods. Subsequently, the syntax can be executed in the programs `OpenBUGS`, `WinBUGS` or in `R` program through the libraries `R2WinBUGS`, `R2OpenBUGS`, `BRugs` or `rbugs`.

BayesianModeling is thought for practitioners that, given a data set, wish to know the syntax of diverse IRT models in bugs code, usually non available in diverse statistical programs including the program `R`. This program produces two files: i) a bugs file for each one of the available models, including priors, lists with sensible starting values and the size of the data set and ii) a data file in rectangular form. Both files are readable in `WinBUGS` or `OpenBUGS`. Information about of the software can be downloaded from http://argos.pucp.edu.pe/ jlbazan/software.html.

IRT models considered

Let Y_{ij} denote a dichotomous variable corresponding to the response of the i*th* individual, to the j*th* item ($i = 1, ..., n$, $j = 1, ..k$).

Y_{ij} takes the value 1 if the response is correct and 0, otherwise. A dichotomous IRT model follows by considering,

$$\begin{aligned} Y_{ij}|\,\theta_i, \eta_j &\sim Bern(p_{ij}) \\ p_{ij} = c_j + (1-c_j)F_{\delta_j}(m_{ij}), \\ m_{ij} &= a_j\theta_i - b_j \end{aligned}$$

with $a_j > 0, -\infty < b_j < \infty, 0 \leq c_j < 1$, and $-\infty < \theta < \infty$ and Bern(.) denoting a Bernoulli distribution. The probability $p_{ij} = P(Y_{ij} = 1|\,\theta_i, \eta_j)$ is the *conditional probability of correct response* given the i-*th* ability value θ_i and the j-*th* item parameter $\eta_j = (a_j, b_j, c_j, \delta_j)$ where a_j, b_j, c_j, δ_j are named discrimination, difficulty, guessing and penalization item parameter respectively. Moreover, $F_{\delta_j}(.)$ denotes a cumulative distribution function (cdf) indexed by δ_j and m_{ij} is the *latent linear component* relating θ_i and the item parameter η_j.

$F_{\delta_j}(.)$ is a monotone increasing function of the unidimensional quantity θ_i and satisfies the *latent conditional independence principle*: for the i*th* examinee, $\{Y_{ij} : j \geq 1\}$ are conditionally indepen-

dent given θ_i. It is also assumed that responses from different individuals are independent.

Let $\mathrm{y}_i^T = (y_{i1}, \ldots, y_{ik})$ be the vector of responses provided by the i*th* person, $\theta^T = (\theta_1, \ldots \theta_n)$ and $\eta^T = (\eta_j, \ldots, \eta_k)$. The probability function of $\mathrm{y} = (\mathrm{y}_1^T, \ldots, \mathrm{y}_n^T)^T$, given the vector of latent variables θ^T and the item parameter vector η^T, is given by

$$p(\theta, \eta | \mathrm{y}) = \prod_{i=1}^{n} \prod_{j=1}^{k} [p_{ij}]^{y_{ij}} [1 - p_{ij}]^{1-y_{ij}} .$$

In order to define the likelihood function for the relevant parameters a specific distribution (link) function $F_{\delta_j}(.)$ must be chosen.

The IRT models implemented in *BayesianModeling* are classified according to teh corresponding link function:

- Symmetric: logit (1L, 2L, 3L), probit (1P, 2P, 3P).
- Asymmetric: LPE (1LPE, 2LPE, 3LPE), RLPE (1RLPE, 2RLPE, 3RLPE), skew probit (1SP, 2SP).

where L denote the use of standard logistic cdf, P the use the standard normal cdf, LPE the use of the Type-I generalized logistic cdf, $RLPE$ the Type-II generalized logistic cdf and SP the use of standard skew normal cdf. In addition, 1, 2 and 3 are respectively used to denote if parameters a_j, (a_j, b_j) and (a_j, b_j, c_j) are considered. Specification of priors for these models is discussed in [3] and [7].

A simple example

BayesianModeling generates the code for the Bayesian estimation of several IRT models, and requires the data saved in a plain file format where the names of the items appear in the first line.

As an example, consider a data set of $k = 14$ items and $n = 131$ students from a Mathematics test and the 2SP model described in [2]. Following the user Manual ([3]), the following code is generated:

```
model{
for (i in 1:n) {
for (j in 1:k) {
m[i,j]<-a[j]*theta[i]-b[j]
muz[i,j]<-m[i,j]-delta[j]*V[i,j]
Zs[i,j] ~ dnorm(muz[i,j],preczs[j])I(lo[y[i,j]+1],up[y[i,j]+1])
V[i,j] ~ dnorm(0,1)I(0,)
}
}
#abilities priors
for (i in 1:n) {
theta[i]~dnorm(0,1)
}
#items priors
for (j in 1:k) {
# usual priors
#Bazan et al (2006)
# difficulty (-intercept) with prior similar to bilog
b[j] ~ dnorm(0,0.5)
# discrimination
a[j] ~ dnorm(1,2)I(0,)
# difficulty centred in zero
bc[j] <- b[j] - mean(b[])
#Bazan et al 2006
delta[j] ~ dunif(-1,1)
preczs[j]<- 1/(1-pow(delta[j],2))
lambda[j]<-delta[j]*sqrt(preczs[j])
}
lo[1]<- -50; lo[2]<- 0 ## Zs*|y=0~N(-delta*V+m,1-delta^2)I(-50,0)
up[1]<- 0; up[2]<-50 ## Zs*|y=1~N(-delta*V+m,1-delta^2)I(0,50)
mu<-mean(theta[])
du<-sd(theta[])
}
}

data
list(n=131,  k=14)
#load your data in other file
Inits
list(
a=c(1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0,1.0),
b=c(0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0),
delta=c(0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0),
theta=c(0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,
0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,
0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,
0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,
0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,
0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,
0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,
0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,
0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,
0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,0.5,
0.5,0.5,0.5))

#Bazan, J., Bolfarine, H., Leandro, A. R. (2006). Sensitivity analysis of
#prior specification for the probit-normal IRT model: an empirical study.
#Estadística, Journal of the Inter-American Statistical Institute. 58(170-171),
#17-42.
#Available in http://www.ime.usp.br/~jbazan/download/bazanestadistica.pdf

#Bazan, J. L., Branco, D. M. & Bolfarine (2006). A skew item response model.
#Bayesian Analysis, 1, 861-892.
```

In this example an augmented likelihood is involved, thus requiring a generalization of the normal ogive IRT model as presented in [1]. In any case, Bayesian estimation in R can be obtained using, by example, the library `R2WinBUGS`, with the following code

```
library(R2WinBUGS)
datos <- read.table("F:/MILUS/MathData.dat", header=TRUE, sep="", na.strings="NA",
dec=".",strip.white=TRUE)
n=nrow(datos)
k=ncol(datos)
data<-list(y=as.matrix(datos),n=131,k=14)
inits <- function(){ list(a=rep(1,k),b=rep(0,k),delta=rep(0,k),theta=rep(n,0.5))}
out<-bugs(data,inits,parameters.to.save=c("a","b","delta"),
model.file="F:/MILUS/modelirt.txt", n.chains=1, n.iter=24000,
n.burnin=4000, program="WinBUGS")
```

Results for this model and this type of data are showed in [2]. More details of this software, including the use of other binary response models, can be found in [3]. In addition, A key reference on the Bayesian approach to IRT models is [8].

A more general version of *BayesianModeling* is being developed. The aim is to include a varie-

ty of other statistical models widely used in the Social Sciences research. Comments and suggestions from users as welcome.

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[2] Bazán J. L, Branco MD, Bolfarine H. A skew item response model. Bayesian Analysis, 1, 861–892, 2006.

[3] Bazán J. L. BayesianModeling User´s Guide. Sciences Department. Pontifícia Universidad Católica del Perú. Available in `http://argos.pucp.edu.pe/~jlbazan/software.html`

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[8] Sahu S. K. Bayesian estimation and model choice in item response models. Journal Statistical Computing Simulation, 72, 217–232, 2002.

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STUDENTS' CORNER

- Isadora Antoniano & Antonio Ortiz -
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We are happy to announce that Luke Bornn finished his PhD, and we hope he will be moving from the students' corner to a nice spacious office. We would like to thank him for his great work in the previous issues, since from now on we are replacing him as Co-Editors of the Student's Corner section. We also want to express our gratitude to Manuel Mendoza for this opportunity, and of course, once more to Luke, for his helpful advices.

We both are fourth year PhD students at the University of Kent, UK. We are quite good friends. Therefore, should you need to send any email regarding this section, you can use either or both of our email addresses. Do not feel any pressure to remember to send the emails to both of us, or "just to the lady" or 'just to the gentleman". Be sure the information will reach us both.

Regarding the current issue, we are glad to inform you that the members of the panel of leading Bayesian statisticians have kindly accepted to continue sharing their experience with us through the Q & A section. Of course, we encourage you to keep sending your thesis abstracts if you have recently graduated and want to publish your dissertation topic. We would like to keep the panel's neurones busy with new questions, so if you have any, we are eager to receive it.

Please, feel free to email us any suggestion to improve this section; we would be very pleased to hear from you.

Q & A

For graduating PhD students who might have only one collaborator, namely their supervisor, what suggestions would you give for building a network of collaborators and colleagues?

Dani Gamerman
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The starting point must be making your lines of research known to your possible collaborators. This is achieved by publishing papers and also presenting your work at scientific meetings. You may also be lucky to have a collaborator visiting your department. Make use of this opportunity!

Meetings are nice occasions to interact with researchers, as they typically occur in a more relaxed atmosphere (specially smaller ones). Once a connection is established and common interests are ascertained one can then talk about possible future directions and interests. In many cases, this will draw the attention from possible collaborators. In other cases, it won't.

Invitations for visits from either end will then be the next step for joint research work to flourish, even though Internet links are a very strong element of today's life. But I still think nothing replaces the personnal contact, specially for establishing clearly the groundwork for a research project. Secondary details may then be left for discussion at virtual level.

In summary, be open to what is going on around you. But the most important tip is to persevere; don't give up!

Peter Green
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Networks are important, not least because they are fun! - it is much more rewarding to feel you are part of an academic/research community, rather than only an isolated and junior researcher. So this is a good question.

I would suggest you get started by trying to make two kinds of contact: people in a similar stage of their career as you, possibly close geographically but probably not so similar in research interests, and people probably more senior to you, in the same line of research.

Here in the UK, we have annual national conferences for Research Students and for Young Statisticians, and there is also a lively and active Young Statisticians' Section of the RSS - these are good places to start to make friends and develop contacts. Try to get actively involved in organisation of events or other activities. There's also probably a role for social media, from general tools like Facebook to more professionally-focused ones like LinkedIn, but I'm too old-fashioned to have any specific knowledge about these!

Getting to know more senior people in your research area can be daunting. You might be tempted to take the apparently less exposed and embarrassing approach to introducing yourself by using email, but I would really strongly advise face-to-face contact instead. Senior researchers get a lot of letters from students and others asking for anything from extra explanation of a published research paper to open-ended queries about 'what are you working on at the moment?' or even 'what should I work on next?'. These might work, but with the best will in the world, busy people are unlikely either to be as helpful as you would like, or to remember you afterwards. Much better to introduce yourself to the person you want to get to know by approaching them at a conference, for example with a focused and ideally intelligent question. That might give you an opportunity to lead on to saying something about your own work, perhaps following it up by sending a copy of a tech report.

More generally, treat conferences for the tremendous opportunities they are - don't stay within your comfort zone, talking only with people you already know, but actively seek out new faces, junior or senior. Getting to conferences in the first place has never been easier, the cost of travel is relatively low in relative terms, and many conferences and workshops give preferential access to young researchers with bursaries and other funding schemes.

Good luck - and I look forward to meeting you!

Paul Gustafson
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As I've aged, I've increasingly sought more collaboration with non-statisticians. Two personal experiences stand out for me, and these have helped shape my thinking about finding good collaborations. For the sake of clear discussion, let's define some terms. Let's call declining (rejecting?) an invitation to collaborate, when in fact the collaboration would have been fruitful, a type I error. Similarly, a type II error is taken as accepting (not rejecting?) an invitation to collaborate, when in fact the collaboration turns out to not be fulfilling.

Quite a few years ago, I committed a type I error, and I fall back on this as a lesson learned. I was approached by a health researcher at a dif-

ferent university about working on an ongoing project of his. Even though this potential collaborator was interested in Bayesian methodological developments, I was worried about conserving time for working on 'pure' theory/methods stuff. So, after a bit of back and forth, I declined politely. I know for sure that this was a type I error, since, to his credit, the said researcher has a thick skin. Some months later, and notwithstanding my 'brush-off,' he invited me to speak at his institution. We had great discussions during my visit, and now we have worked, and are working, on a number of projects. My intellectual and professional life would be poorer without him, and I owe him a debt of gratitude for being stubborn!

A bit more recently, I thought I had committed a type II error. I became involved as 'the statistician' on a health survey. This did not stem from any initial fit with my research interests (side note: Bayes and sample survey ideas don't always co-exist so easily). Rather, I fell into it because I knew some of the investigators via a non-work route. Initially I felt like a fish out of water at the study planning meetings. Thoughts like 'too applied,' 'not my area,' and 'I don't care about questionnaire design' were bouncing around in my head. Ultimately, though, I was able to make a contribution to the questionnaire design, via a question which could help to mitigate selection bias in the later analysis. Moreover, I was able to forge a fruitful link with my research program via a methodological question about selection bias. So, in fact it turned out to be a correct decision after all.

Forging fruitful collaborations is a bit of a messy business, and one must make decisions in the face of uncertainty. But my own experiences have taught me that, as in much of life, an appropriate adage is nothing ventured, nothing gained!

Dave Higdon
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Here's my experience. My fellow grad students were great colleagues to me when I first started my career, and still are today. We share a common bond of surviving courses, professors, and qualifying exams. They are all easy to talk to, and it's not like I have to worry about sounding like I know what I'm talking about with them. They've seen my test scores. Now, 18 years later, I have this great set of colleagues and friends.

Shortly after graduate school, I was lucky enough to go to a number of smallish workshops and meetings where I met others who were at similar stages in their careers. Many of these people I've kept in touch with at conferences, workshops, etc.

Working at a university, and later at Los Alamos National Laboratory, I often had the chance to meet up with more senior statisticians, as well as researchers in other fields. We might talk science, sports, or life, and sometimes this might lead to some form of collaboration. This approach has worked great for me. I've gotten to be part of all sorts of scientific collaborations, I've gotten to have fun, and I've gotten lots of material for papers, publications, and grant proposals along the way. I've also gotten lots of help at times when I felt I was in over my head.

Maybe I've been lucky. I'm not sure how representative my experience is. For what it's worth, here are my suggestions.

Stay in touch with your fellow grad students – they're an invaluable source of fun, knowledge and support. Get to know fellow colleagues who got their PhDs close to when you did. They'll be facing similar challenges. They may even think like you since they grew up watching the same TV shows. Make connections with other scientists – even if there is no obvious publishable unit on the horizon. You'll be exposed to interesting problems; you'll have a chance to demonstrate the utility of statistics; you'll become good at scientific interaction; you'll demonstrate what kind of person you are; and eventually there might even be a paper in it. Be a good colleague. Think and talk about stats/science with folks. Listen a lot. Do something that is in your wheelhouse – maybe it's teaching, organizing conferences, collaborating, computing, whatever – just spend some time using your gifts. Help people out. Work hard. Be fun.

In the end you'll likely have a large collection of colleagues who will supply you with technical expertise, contacts, advice, dinner company, seminar invites, and the occasional emergency review when you've fallen behind on your AE duties.

Alejandro Jara & Fernando Quintana
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We proceed here under the assumption of an individual interested in building an acade-

mic/research career. There are several options. We briefly discuss some of those below:

1. Try to meet and get to know visitors while they are at your university, even if your advisor is not hosting them. Finding that a visitor to your university is involved in a related research area can lead to future joint work, or at least, to useful advice about your current and future research.

2. Go to as many meeting as you can afford. Conferences are vital when it comes to initiating collaborations as you will meet your counterparts who are conducting research in the same area. There are plenty of examples of very good collaboration stories that started in a coffee shop/bar/restaurant close to a conference venue! Presenting a poster or paper at these events increases your visibility and introduces your work to potential collaborators.

3. Contact people directly. Quite often, people react very positively when you write/call them directly to request a comment or to discuss research areas of common interest. Some very famous papers were conceived and written entirely via e-mail/Skype communication.

4. Try to get a postdoctoral position in some active environment. If so, you are bound to run into many people that may become part of the desired network. At the very least, you will get useful tips about whom to contact and also about your own work.

In general, jump in at any occasion you may have to communicate your work or to discuss it with some other colleagues or fellow PhD students. Do not get discouraged if things move slowly at the beginning, because eventually, your list of collaborators will grow.

Stephen Walker
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This is a bit tough, as it boils down to character and personality. In many ways, who one meets and works with is down to luck. The usual attending conferences, going to seminars, giving seminars, discussing ideas with people, are the obvious.

The problem is I have never thought about the science of networking or collaborating; it has just happened, the collaborating that is. Ultimately, I don't believe there is any substitute for having ideas and having skills. Ideas to write ones own works, or seeking help, if needed, to develop an idea or push an aspect of it. Having skills so people seek assistance with their ideas.

One can spend too long seeking out the next collaborator, but it is not possible to spend too long developing ideas and skills to share with others.

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ISBA 2012 Program

Monday 25th	Tuesday 26th	Wednesday 27th	Thursday 28th	Friday 29th
	Registration	Registration	Registration	Registration
	Opening 8:30 hrs.			
	Parallel sessions 9:00 hrs.	***Parallel sessions 9:00 hrs.***	***Parallel sessions 9:00 hrs.***	***Parallel sessions 9:00 hrs.***
	Bayesian methods in Biostatistics Yuan; Mueller & Rossell (A)	**Auxiliary variable and particle MCMC methods** Chopin; Lee & Jacob (A)	**Applications of particle filtering and sequential updating** Pitt; Sisson & Kohn (A)	**Topics in Bayesian Statistics** Meng; Johnson & Daniels (A)
	Advances in Gaussian processes Liang; Caufmann & Lee (B)	**Being simultaneously Bayesian and frequentist** Lumley; Mukherjee & Rice (B)	**Bayesian semi-parametric analysis: theory** van Zanten; Castillo & De Blasi (B)	**Savage Award Session** Jang; Mandel; Martínez-Ovando & Scheipl (B)
	Bayesian empirical likelihood Lazar; Ghosh; Basu & Chaudhuri (C)	**Bayesian applications** Carvalho; Draper; Richardson & Prado (C)	**Bayesian methods in biological, environmental and ecological systems** Telesca; Muthukumarana; Berrocal & Mondal (C)	**Bayesian spatio-temporal disease mapping: new frontiers** White; Cramb; Li & Wheeler (C)
	Bayesian Econometrics IV Gerlach; So; Forbes & Chen (D)	**Beta processes: extensions and applications** Kim; Williamson; Broderick & Hjort (D)	**Bayesian graphical and factor models: structure, sparsity and dimension** Yoshida; Cron; Wang & Hahn (D)	**Bayes modeling in marketing** Allenby; Abe; Kondo & Terui (D)
	Coffee break (10:30 hrs.)	*Coffee break (10:30 hrs.)*	*Coffee break (10:30 hrs.)*	*Coffee break (10:30 hrs.)*
	Parallel sessions 11:00 hrs.	***Parallel sessions 11:00 hrs.***	***Parallel sessions 11:00 hrs.***	***Parallel sessions 11:00 hrs.***
	Model selection George; Scott & Bayarri (A)	**Partial identification and causal inference: what can Bayes bring to the table?** Kitagawa; Chib & Gustafson (A)	**Time Series analysis and Finance** Mira; Nakajima & Omori (A)	**Bayesian analysis of inverse problems** Haario; Herbei & Fox (A)
Registration	**Bayesian Econometrics** Frühwirth-Schnatter; Norets & Geweke (B)	**Bayesian analysis of network data: from network determination to network modeling** Guindani; Pillai & Rodriguez (B)	**Problem-driven developments in Bayesian nonparametrics** Teh; Bacallado & Petrone (B)	**S'Bayes: constructing and using subjective priors for Bayesian modelling** Goldstein; Choy & Gill (B)
ISBA lecture on Bayesian foundations 13:00 hrs. **Some frequentist results on nonparametric Bayesian analysis** Aad van der Vaart	**Optimal Bayesian experimental design** Kim; Huan; Morita & Solonen (C)	**Scaling Bayesian computation to handle big data: methods and feasibility** Jordan; Kou; Atchade & Woodard (C)	**Bayesian model assessment** Clyde; Hatfield; García-Donato & Mulder (C)	**Bayesian models for high-dimensional complex-structured data** Brown; Guha; Morris & Banerjee (C)
	Approximate Bayesian computation: likelihood-free Bayesian inference I Stumpf; Prangle; Drovandi & Rousseau (D)	**Applied Bayesian Econometrics** Lopes; Smith; Villani & Wagner (D)	**Approximate Bayesian computation: likelihood-free Bayesian inference II** Nott; Blum; Marin & Ratman (D)	**Applications of non- and semi-parametric Bayesian methods** Kottas; Lee; Griffin & Quintana (D)
	Lunch (12:30 hrs.)	*Lunch (12:30 hrs.)*	*Lunch (12:30 hrs.)*	*Lunch (12:30 hrs.)*
	Keynote lecture 14:00 hrs. **Data assimilation and sequential Bayes filters: information fusion with numerical simulation** Tomoyuki Higuchi	***Keynote lecture 14:00 hrs.*** **Bayesian methods in cancer genomics** Chris C. Holmes	***Keynote lecture 14:00 hrs.*** **Advances in Bayesian nonparametric regression and Time Series** Stephen G. Walker	***Keynote lecture 14:00 hrs.*** **Bayesian inference with intractable likelihood functions** Arnaud Doucet
ISBA lecture on Bayesian foundations 14:15 hrs. **Bayesian dynamic modelling** Mike West	***Parallel sessions 15:00 hrs.***	***Parallel sessions 15:00 hrs.***	***Parallel sessions 15:00 hrs.***	***Keynote lecture 14:45 hrs.*** **Demographic analysis of forest dynamics using stochastic integral projection models** Alan Gelfand
	Networks and relational data McCormick; Handcock & Lunagomez (A)	**On the uses of random probabilities in Bayesian inference** Orbanz; Mena & Lijoi (A)	**Adaptive Bayesian function estimation** Belitser; Tokdar & Lian (A)	
	Adaptive Monte Carlo Fort; Vihola; Salakhutdinov & Wang (B)	**Bayesian methods for Spatial Statistics** Haran; Sang; Huerta & Yang (B)	**Bayesian Econometrics III** Amisano; Watanabe; Basturk & Ando & Choi (B)	
Coffee break (15:30 hrs.)	**Hierarchies of Bayesian nonparametric processes** Fox; Kim; Favaro & Wood (C)	**Bayesian Econometrics II** Jacobi; Strachan; Leon-Gonzalez & Chan (C)	**Case studies of Bayesian success stories: babies, trials and ratings** Saria; Carlin; Ji & Glickman (C)	**General meeting** ***16:00–17:30 hrs.***
ISBA lecture on Bayesian foundations 16:00 hrs. **Approximate Bayesian computation: advances and questions** Christian Robert	**Recent advances in Bayesian causal inference** Mealli; Li; Gao & Gutman (D)	**Bayesian analysis of protein structure and evolution** Englehardt; Zhang; Czogiel & Challis (D)	**Parallel processing in Bayesian computing** Suchard; Niemi; Scott & McAlinn (D)	
	Coffee break (16:30 hrs.)	*Coffee break (16:30 hrs.)*	*Coffee break (16:30 hrs.)*	
	Parallel sessions 17:00 hrs.	***Parallel sessions 17:00 hrs.***	***Parallel sessions 17:00 hrs.***	
	Predictive inference and Bayes methods Clarke; Parry & Komaki (A)	**Nonparametric Bayes applications in Biostatistics** Baladandayuthapani; Trippa & Nieto-Barajas (A)	**Spatial state-space models** Sanso; Manolopoulou & Strickland (A)	
	Beyond MCMC methods in Bayesian inference Braun; Andrieu; Stroud & Kalli (B)	**Recent advances in Bayesian variable selection** Hans; Tadesse; Leman & Ghosh (B)	**Bayesian modeling and its applications in social science** Sun; Nicholls; He & Lu (B)	
ISBA lecture on Bayesian foundations 17:15 hrs. **Slowly but surely, Bayesian ideas revolutionize medical research** Donald A. Berry	**Bayesian inference in science: the pursuit of a synergy** Held; Tingley; Lemos & Rigat (C)	**Bayesian analysis of astronomical data** Trotta; Mahabal; Philip & Stoica, Martinez & Saar (C)	**Bayesian methods in reliability** Mazzuchi; Soyer; Soofi & Wilson (C)	
	Bayesian methods in drug development McGree; Savelieva; Bornkamp & MacEachern (D)	**Advances in honest Monte Carlo** Flegal; Huber; Jones & Khare (D)	**High dimensional graphical models in genomics** Stingo; Liverani; Lenkoski & Bottolo (D)	
Welcome reception ***19:30 hrs.***	***Poster session*** 18:30–21:00 hrs.	***Poster session*** 18:30–21:00 hrs.	***Poster session*** 18:30–21:00 hrs.	

Last update: March 15, 2012