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SPECIAL ISSUE: BAYESIAN INFERENCE AND STOCHASTIC COMPUTATION

Preface

Ryo Yoshida · Genta Ueno · Arnaud Doucet

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The past 20 years have witnessed the fast growth of Bayesian computational techniques such as Markov chain Monte Carlo (MCMC), Sequential Monte Carlo (SMC), and Approximate Bayesian Computation (ABC) methods. These methods have revolutionized the practice of Bayesian statistics and have found applications in fields as diverse as ecology, neuroscience, astronomy, economics and biology. The methodological and theoretical foundations are now well established. However, this remains a very active research area where significant new opportunities have appeared with the emergence of massive, high-dimensional and complex data.

On June 22–23, 2012, the Bayesian Inference and Stochastic Computation workshop (BayesComp 2012) was held at the Institute of Statistical Mathematics in Tokyo, Japan. The workshop consisted of 11 invited talks and many posters, which showed the recent developments in Bayesian computational methodology and innovative applications in molecular biology, neuroscience and astronomy. Nearly 200 participants gathered from all over the world to attend this scientific meeting.

This special issue of AISM contains five papers of invited speakers at BayesComp 2012 and two more papers closely related to the topics of the workshop. All these papers have been reviewed under the standard reviewing procedure of AISM. The original research articles of this special issue discuss the latest developments in theory/methodology and novel applications whereas a review article presents in a com-

R. Yoshida (✉) · G. Ueno
The Institute of Statistical Mathematics, Tachikawa, Tokyo, Japan
e-mail: yoshidar@ism.ac.jp

G. Ueno
e-mail: gen@ism.ac.jp

A. Doucet
Department of Statistics, University of Oxford, Oxford, UK
e-mail: doucet@stats.ox.ac.uk

prehensive way the current state of Bayesian methods. We believe this special issue is a timely addition to the Bayesian statistics literature.

Finally, we would like to thank the invited speakers and participants of the BayesComp 2012 workshop. We are also grateful to the authors, the reviewers and the members of the editorial board of AISM who made this special issue possible.

Ryo Yoshida, Genta Ueno and Arnaud Doucet - Guest Editors