

## ‘The 21<sup>st</sup> Century Belongs to Bayes’ Debate: Introduction

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The primary aim of the Rimini debate was to highlight the value of both the Bayesian and frequentist (classical) paradigms, and the contributions that both make to statistical practice in the applied sciences. That said, I (the organizers?) did not wish the exercise to be a sanitized one, with the shortcomings of both methods also to be confronted. Hence, a topic was chosen that was provocative enough to bring those shortcomings to the fore, but which also had the potential to lead to some reconciliation between these two important areas of intellectual endeavour. The topic also seemed particularly apt, being positioned as we are at the beginning of the second decade of the new century, and nearly two decades on from the advent of the (Bayesian) Markov chain Monte Carlo ‘revolution’.

The two speakers were selected by the organizers because of their renowned authority in the respective fields of Bayesian and frequentist inference, with both serving to produce stimulating and lively presentations for the audience. For the purposes of publication, however, both authors have chosen to synthesize their presentations into two short, but dense, treatises on the respective paradigms. As Russell Davidson has crafted his paper in such a way that poses certain pertinent questions to the Bayesian community, we have published his paper first. Christian Robert, in addition to expounding his view of the Bayesian paradigm - and the reasons for his adherence to it - then addresses some of those questions. Christian Robert also plays the devil’s advocate throughout his own paper, noting criticisms that have

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been levelled at various aspects of the Bayesian approach, before answering those criticisms in a detailed and convincing manner.

Most notably, both speakers have chosen to avoid deep philosophical arguments about such issues as the meaning of probability, and the relative validity of assigning probability distributions to parameters/models, and sampling distributions to statistics. Instead, both authors have focussed (primarily) on 1 matters of importance to the practising statistician or econometrician. These issues include (amongst many others) the role played by prior information in statistical inference, the treatment of identification problems, the choice between parametric and non-parametric approaches, and the distinction between model selection and hypothesis testing. In summary, much ground is covered and much food for thought provided to the reader! Enjoy!