

Institute of Mathematical Statistics

COLLECTIONS

Volume 3

**Pushing the Limits of Contemporary
Statistics: Contributions in Honor of
Jayanta K. Ghosh**

Bertrand Clarke and Subhashis Ghosal, Editors

Institute of Mathematical Statistics



Beachwood, Ohio, USA

Institute of Mathematical Statistics
Collections

Series Editor:
Anthony Davison

The production of the *Institute of Mathematical Statistics
Collections* is managed by the
IMS Office: Rong Chen, Treasurer and
Elyse Gustafson, Executive Director.

Library of Congress Control Number: ???

International Standard Book Number ???

International Standard Serial Number 0749-2170

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Printed in Lithuania

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Preface

Jayanta Kumar Ghosh is one of the most extraordinary professors in the field of Statistics. His research in numerous areas, especially asymptotics, has been groundbreaking, influential throughout the world, and widely recognized through awards and other honors. His leadership in Statistics as Director of the Indian Statistical Institute, President of the International Statistical Institute, among other eminent positions, has been likewise outstanding. In recognition of Jayanta's enormous impact, this volume is an effort to honor him by drawing together contributions to the main areas in which he has worked and continues to work. The papers naturally fall into five categories.

First, sequential estimation was Jayanta's starting point. Thus, beginning with that topic, there are two papers, one classical by Hall and Ding leading to a variant on p-values, and one Bayesian by Berger and Sun extending reference priors to stopping time problems.

Second, there are five papers in the general area of prior specification. Much of Jayanta's earlier work involved group families as does Sweeting's paper here for instance. There are also two papers dwelling on the link between fuzzy sets and priors, by Meeden and by Delampady and Angers. Equally daring is the work by Mukerjee with data dependent priors and the pleasing confluence of several prior selection criteria found by Ghosh, Santra and Kim. Jayanta himself studied a variety of prior selection criteria including probability matching priors and reference priors.

Third, between his work on parametric Bayes and nonparametrics, Jayanta took an interest in model selection. Accordingly, three papers on model selection come next. Bunea's work on consistency echoes Jayanta's work on consistency of the BIC. Chatterjee and Mukhopadhyay's work on data adaptive model averaging continues the direction he started under Jayanta's guidance. Chakrabarti and Samanta's work on the asymptotic optimality of predictive cross validation contrasts nicely with standard Bayes model selection, via the BIC for instance.

Fourth, there are five papers generally on Bayesian nonparametrics. Some are applied as in Malec and Mueller's work on semi-parametrics in small area estimation or Guo, Dey and Holsinger's work carefully using prior selection for modeling purposes. And some are more theoretical: Choi and Ramamoorthi provide a review, with some new results, on posterior consistency while James focuses on a class of priors and van der Vaart and van Zanten focus on the role of Reproducing Kernel Hilbert spaces in Bayesian nonparametrics with Gaussian process priors.

Finally, Jayanta has most recently turned his attention to high dimensional problems. On this topic, there are five papers from a variety of standpoints. For instance, it is possible to make unexpected use of the information in the large dimensions themselves as in Sen's work with Kendall's tau. Others focus on the parametric parts of a nonparametric model as in Ishwaran and Papana, or in Bhattacharya and Bhattacharya. A third tack in Clarke and Seo is the focus on selecting the dimensions for use in emerging model classes. Finally, the work of Bickel, Li and Bengtsson establishes a general convergence result for computing conditional distributions.

As can be seen, some papers fit comfortably into more than one section and some only fit into a section if it is interpreted broadly. Even so, we would like to

think that the papers have achieved a nice tradeoff between clustering rather nicely around the topic of each category and maintaining a reasonable diversity in line with Jayanta's work.

Despite his diverse research interests, asymptotics and their applications have been the main recurring theme of Jayanta's research since he published his first paper in sequential statistics in 1960 (at the age of 23). So, as a generality, asymptotics undergirds most of the material in this volume honoring him.

Fortunately, asymptotic thinking pervades statistical inference, even in the most applied contexts. So, this is hardly a limitation. On the other hand, asymptotics has a way of being impenetrably abstract. However, all the papers here, are, in Woodroffe's memorable phrase, written at a level that would be 'accessible to a determined graduate student'. We encourage readers to have a look at least at the introductions of papers outside their research area, just for pure love of the field and the joy of intellectual stimulation. We suspect that once someone has read the introduction, he or she will be ineluctably led to finish reading the whole paper.

As Editors, we have been delighted at the depth and quality of work our contributors submitted. They all make foundational points in the spirit of Jayanta. We believe each paper will be of interest to researchers, theoretical and applied, who confront problems that are difficult enough that conventional solutions are inadequate and closed form solutions are intractable in the several areas covered here. We are deeply grateful to all contributors for offering their finest work to this volume.

Of course, no volume such as this could have been possible without the free and anonymous labor of referees: You folks know who you are, but for the sake of confidentiality we cannot name you. We especially thank those who provided extremely prompt reports when we badly needed them. If any of you meet one of us at a conference, we owe you a drink. Probably two – you helped us immeasurably.

In terms of actually producing this volume, Jennifer Clarke provided invaluable support. She helped us repeatedly with compiling complete versions of the volume. In particular, the final, detailed copy-editing was her work; the balance of her account in the Bank of Karma is astronomical. We can't thank her enough.

Along the way there were many other people who gave us their time and expertise. Dipak Dey helped guide us as we prepared initial proposal. Rick Vitale, the former Editor for the LNMS series, also did a first rate job in explaining the details of how we had go about this kind of project, if we wanted it to be successful. Rick then gave the initial approval – thanks, Rick! Anthony Davison, the current Editor for the LNMS series, worked closely with us to get the volume in final form and then gave it final approval. We appreciate the burden that you carried for us, Anthony.

Finally, we are grateful that the IMS put its scarce resources into supporting this volume. The IMS has a tradition of honoring its most illustrious members and, in our view, Jayanta is most assuredly among them.

It was a pleasure to put this tribute together and we hope that in some small way we have served the interests of the research world.

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November 2007

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