Advances in Applied Probability

The Editorial Board would like to encourage the submission to the *Advances* of review papers summarising and coordinating recent results in any of the fields of applied probability.

In addition to these review papers, *Advances* is also designed to be a medium of publication for (1) longer research papers in applied probability, which may include expository material, (2) expository papers on branches of mathematics of interest to probabilists, (3) papers outlining areas in the biological, physical, social and technological sciences in which probability models can be usefully developed, (4) papers in applied probability presented at conferences which do not publish their proceedings, and finally, (5) letters to the editor on any appropriate topic in applied probability.

As from March 1994, *Advances* will include a new section devoted to stochastic geometry and statistical applications (see the announcement and call for papers elsewhere in this issue).

In short, the main function of *Advances* is to define areas of recent progress and potential development in applied probability. As with the *Journal of Applied Probability*, *Advances* under-takes to publish papers accepted by the Editors within 15 months of their submission; letters to the editor will normally be published more rapidly.

Volume 25 No. 1 of *Advances* contains the following papers:

Subscription rates (per volume) for the *Advances* in 1993 are the same as for the *Journal* (see inside back cover). A discount of 10% is allowed to subscribers who order current issues of both the *Journal* and *Advances* at the same time direct from the Applied Probability Office. A detailed price list for both current and back issues is available on request.

Cheques made out on US, UK and Australian banks will be acceptable: they should be made payable to *Applied Probability*, and sent to:

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Department of Probability and Statistics,
The University, Sheffield S3 7RH, UK

ANNOUNCEMENT

Launch of a new section

'Stochastic Geometry and Statistical Applications'

within *Advances in Applied Probability*

Following extensive discussions, the Applied Probability Trust (APT) has decided on a new publication initiative in stochastic geometry to commence in March 1994. Details are outlined below.

1. A specially identified subsection of *Advances in Applied Probability* (AAP), to be entitled 'Stochastic Geometry and Statistical Applications' (SGSA), will be established commencing with Volume 26, No. 1 (1994). The number of pages printed in AAP will be expanded as necessary to accommodate SGSA.
2. The scope of the new section is outlined in an editorial statement given overleaf.
3. W. S. Kendall, D. Stoyan and R. A. Vitale have been appointed to the Editorial Board of the Applied Probability Journals.
4. Special responsibility for SGSA will be carried by a subset of the Editorial Board consisting of A. J. Baddeley, W. S. Kendall (Coordinating Editor), D. Stoyan and R. A. Vitale.
5. Editorial procedures for SGSA will be fully integrated with those for AAP, with submission of papers through the Applied Probability Office in Sheffield as at present (see inside back cover for submission procedure).
6. Progress of the section (in terms of interest and submissions) will be monitored for 2–3 years. A decision will then be made by the Trustees of the APT whether to continue with the section, to launch a separate new journal in SGSA if this seems viable, or to reabsorb the section into AAP as an ordinary part of the journal.
7. Submissions in the area of the new SGSA section are especially encouraged. Authors may stipulate that the paper is for SGSA although the Editors will assign material to the section as appropriate.

Scope of 'Stochastic Geometry and Statistical Applications'

Historically speaking the phrase 'stochastic geometry' was coined to describe the theory of random processes whose statistical behaviour is governed by a (typically continuous) group of transformations. However, in present usage it covers a whole variety of interconnected topics, whose common thread is indeed the study of stochastic objects with a strongly geometric flavour, but which extends from very pure-mathematical studies in integral geometry and random set theory through topics of classical probability such as geometric coverage problems or random processes of geometric objects, through to investigations into image analysis theory with a strong statistical component. Characteristically there is a strong interplay between probabilistic and geometric notions (for example the relationships between hitting probabilities and areas and lengths, or between vacancy events and distance-to-nearest-object). However, there are now substantial interactions between ideas of stochastic geometry and statistics, for example in relations between the mathematical morphology approach to image analysis and stochastic geometry, censoring and edge-effects, curve fitting and Palm measures, bootstrapping and spatial data, coverage models and queueing theory.

Despite their variety, all these topics are strongly related by their common geometric and probabilistic themes. Workers in any one topic will have at least a potential interest in any of the others, and new developments in one area frequently make theoretical demands of, or raise new practical possibilities for, other areas. Nevertheless, there is no single 'home journal' for stochastic geometry. Such a 'home journal' would allow authors to assume a common stochastic-geometry vocabulary and motivation (enabling shorter papers!), would be more likely to print images and line drawings than is sometimes the case, and not least would promote serendipitous and creative interactions.

For these reasons the Applied Probability Trust is launching 'Stochastic Geometry and Statistical Applications' (SGSA) as a section of *Advances in Applied Probability*. SGSA will cover the area of Stochastic Geometry as indicated above: briefly this may be taken as comprising papers which would be appropriate for the Applied Probability journals and which have a strong geometric flavour, but it will also include more theoretical papers on integral geometry or random sets which have a clear bearing on stochastic geometry interests, and furthermore it will include papers on (for example) image analysis with a statistical component clearly related to stochastic geometry concerns. This last is less usual for the Applied Probability journals, though there are clear precedents for support of statistical papers by the Applied Probability Trust. The phrase 'Statistical Applications' in the title SGSA has been chosen deliberately to signal

this greater acceptance of statistical topics. An inclusive but *not* exclusive list of topics follows:

- integral geometry,
- random sets, random measures,
- planar and spatial point process, including the theory of processes of geometric objects,
- mathematical morphology,
- statistical image analysis,
- geostatistics,
- random convex hulls,
- applications of random fractal theory,
- theoretical and applied statistical shape theory,
- spatial bootstrapping,
- edge-effects for spatial processes,
- spatial limit theorems,
- coverage processes,
- random search algorithms,
- probabilistic algorithms for computational geometry,
- spatial medians.

However, stochastic geometry is an exciting and rapidly developing area, and so we confidently expect that the list of typical topics will extend greatly over the next few years! It would not be surprising to see developments in (for example): the interaction between spatial statistics and dynamical systems theory arising from investigations of transport phenomena in environmental systems; applications of stochastic calculus with a strong geometric flavour to problems in animalcule motility; and applications of interacting particle systems and stochastic partial differential equations to meteorological and other problems. Such developments fall naturally within the ambit of SGSA, and good papers on such new developments will be welcomed as warmly as will be papers in the more established areas of stochastic geometry. It is our hope that SGSA will provide a home for the whole family of stochastic geometry topics, whether theoretical or applied, whether established or novel.

THE EDITORS

SUBSCRIPTION RATES

NOTES FOR CONTRIBUTORS

Papers published in the *Journal* are of two kinds:

(1) *research papers* not exceeding 20 printed pages;

(2) *short communications* of a few printed pages in the nature of notes or brief accounts of work in progress.

Review papers, *longer research papers* and *letters to the editor* are published in *Advances in Applied Probability*, a companion journal. (Note: Letters relating specifically to papers which have appeared in the *Journal of Applied Probability* will continue to appear in the *Journal*.)

The editors may publish accepted papers in either journal, according to the space available, in order to meet the 15-month deadline in publication referred to below.

Submission of papers

Papers submitted to the *Journal of Applied Probability* are considered on the understanding that they have not been published previously and are not under consideration by another publication. Papers will not be reprinted without the written permission of the Trust. It is the policy of the *Journal* not to accept for publication papers which cannot appear in print within 15 months of the date of receipt of the final version. Authors will receive 50 reprints of their papers free, and joint authors a proportional share of this number. Additional reprints will be provided at cost.

Papers should be written in English or French; papers in other languages may be accepted by the editors, but will appear (subject to the author's agreement) in English or French translation in the *Journal*. Scripts should be typewritten, using double spacing, and at least one copy should be on one side of the paper only. Each paper should be accompanied by

(i) a short abstract of approximately 4–10 lines giving a non-mathematical description of the subject matter and results;

(ii) a list of keywords detailing the contents for the purpose of computerised information retrieval;

(iii) primary and secondary classifications using the 1991 Mathematics Subject Classification, to be found in the 1990 Annual Index of *Mathematical Reviews*.

Authors are advised to consult *The Author's Guide to the Applied Probability Journals* when preparing papers for submission. A copy of this guide may be obtained on application to the Applied Probability Office.

For efficiency in processing, authors are requested to send three copies of all submissions to the Applied Probability Office in Sheffield, rather than to individual editors. Authors overseas are asked to ensure that their submissions are sent by airmail. The Editor-in-Chief and the Applied Probability Office are in regular contact and full details of all papers submitted are available to Professor Heyde at The Australian National University in Canberra.

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