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A summary listing of 42 technical reports on a wide variety of topics developed in applied statistics and applied probability

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<u>Technical Report No.</u>	<u>Title</u>	<u>Author</u>	<u>Date</u>
412	Comparisons Of Improved Bonferroni And Sidak/Slepian Bounds With Applications To Normal Markov Processes	Donald R. Hoover	02-23-89
413	Approaches For Empirical Bayes Confidence Intervals	Bradley P. Carlin Alan E. Gelfand	03-02-89
414	Tests For The Gamma Distribution With Estimated Shape Parameters	R.A. Lockhart M.A. Stephens	03-14-89
415	Sampling Based Approaches To Calculating Marginal Densities	Alan E. Gelfand Adrian F.M. Smith	04-11-89
416	Subset Complement Addition Upper Bounds - An Improved Inclusion/Exclusion Method	Donald R. Hoover	04-20-89
417	On Estimating The Dependence Between Two Point Processes	Hani Doss	05-04-89
418	Improved Estimation Of The Disturbance Variance In A Linear Regression Model	Alan E. Gelfand Dipak K. Dey	07-11-89
419	An Extension Of Cochran's Test For Homogeneity Of Variances	H. Solomon M.A. Stephens	08-08-89
420	Computer Problems In Goodness-Of-Fit	Michael A. Stephens	08-10-89
421	Illustration Of Bayesian Inference In Normal Data Models Using Gibbs Sampling	Alan E. Gelfand Susan E. Hills Amy Racine-Poon Adrian F. M. Smith	09-06-89
422	Response Linked Censoring: Modeling And Estimation	Donald R. Hoover Frank M. Guess	09-14-89
423	A Sample Reuse Method For Accurate Parametric Empirical Bayes Confidence Intervals	Bradley P. Carlin Alan E. Gelfand	11-07-89
424	Approximations To Joint Distributions Of Definite Quadratic Forms	D.R. Jensen Herbert Solomon	11-21-89
425	A Note On Overdispersed Exponential Families	A.E. Gelfand S.R. Dalal	12-05-89
426	Some Graphical Methods For Assessing The Dependence Structure Between Neuronal Spike Trains	Hani Doss Joseph Marshall	02-13-90
427	Mean Square Error Behavior For Prediction In Linear Regression Models	Alan E. Gelfand	03-07-90
428	Estimation For Dirichlet Mixed Models	Steve Leeds Alan E. Gelfand	05-19-90

Stanford University

STANFORD, CALIFORNIA 94305

DEPARTMENT OF STATISTICS
SEQUOIA HALL

August 11, 1992

Office of Naval Research
800 N. Quincy Street
Arlington, VA 22217

Attention: Mathematical Sciences Division

Re: Final Report N00014-89-J-1627

Dear Sirs:

This letter, the attached list of technical reports issued under the captioned contract, some discussion of the technical memoranda developed under the contract constitute the final report of this contract. The list of technical reports issued in the contract period served by this report, January 1, 1989 - June 30, 1992, begins with Technical Report #412 dated 02-23-89 and ends with Technical Report #454 dated 06-22-92.

The titles of the 42 technical reports indicate the wide variety of the topics developed in applied statistics and applied probability issued under the contract. In addition a number of technical memoranda were developed in response to technical queries from defense department agencies, principally the National Security Agency. A sample of 20 topics studied is attached.

In late March 1992 a conference on Moments and Signal Processing was held at the U.S. Naval Postgraduate School in Monterey. This conference was supported mainly by the National Security Agency and by this contract. A Proceedings volume will be issued containing the eight papers presented in Monterey.

We wish to thank the Office of Naval Research and other contributing defense agencies for their support of this program in "applied statistics."

Sincerely,



Herbert Solomon
Principal Investigator

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BY S. H. SHAW	
DATE AUG 11 1992	
FILE NO. A-1	

<u>Technical Report No.</u>	<u>Title</u>	<u>Author</u>	<u>Date</u>
429	Hitting Lines With Two-Dimensional Brownian Motion	Satish Iyengar	05-27-90
430	On Making The Shortlist For The Selection Of Candidates	Ingram Olkin Michael A. Stephens	06-26-90
431	Improved Estimation Of A Patterned Covariance Matrix	Dipak K. Dey Alan E. Gelfand	07-18-90
432	Bounds On Expectations Of Order Statistics For Dependent Samples	Donald R. Hoover	07-24-90
433	Evaluation Of Normal Probabilities Of Symmetric Regions	Satish Iyengar	07-26-90
434	Improved Estimation Of Variance Components In Mixed Models	Alan E. Gelfand Dipak K. Dey	08-30-90
435	Capture-Recapture Models And Bayesian Sampling	Edward I. George Christian P. Robert	09-11-90
436	Tests Of Fit Based On The Correlation Coefficient	Richard A. Lockhart M.A. Stephens	10-04-90
437	Hierarchical Bayesian Analysis Of Change Point Problems	Bradley P. Carlin Alan E. Gelfand Adrian F.M. Smith	10-18-90
438	Simultaneous Comparisons Of Multiple Treatments To Two (Or More) Controls	Donald R. Hoover	12-27-90
439	Bayesian Analysis Of Constrained Parameter And Truncated Data Problems	A.E. Gelfand A.F.M. Smith T-M. Lee	01-04-91
440	Importance Sampling for Tail Probabilities	Satish Iyengar	02-06-91
441	Weighted Least Squares Estimation For Aalen's Additive Risk Model	Fred W. Huffer Ian W. McKeague	04-17-91
442	Truncated Inverse Sampling Procedure For Multinomial Subset Selection	Pinyuen Chen	05-07-91
443	Confidence Bands For The Median Survival Time As A Function Of The Covariates In The Cox Model	Deborah Burr Hani Doss	06-25-91
444	On Combining Independent Significance Tests	F.J. O'Reilly Michael A. Stephens	07-24-91
445	Bayes Theorem From A Sampling-Resampling Perspective	A.F.M. Smith A.E. Gelfand	07-31-91
446	An Improved First Borel-Cantelli Lemma	Donald R. Hoover	07-31-91
447	A Preliminary Test for Structure in Large, High-Dimensional Data Sets	Fred W. Huffer Cheoivong Park	09-05-91

Technical
Report No.

Title

Author

Date

448	Gibbs Sampling for Marginal Posterior Expectations	Alan E. Gelfand Adrian F.M. Smith	11-19-91
449	Tests of Fit for the Cauchy Distribution Based on the Empirical Distribution Function	M.A. Stephens	12-02-91
450	Accurate Procedures for Approximate Bayesian & Conditional Inference Without the Need for Orthogonal Parameters	Thomas J. DiCiccio Joseph B. Keller Michael A. Martin	02-24-92
451	A Sample-Size Optimal Bayesian Procedure for Sequential Pharmaceutical Trials	Noel Cressie Jonathan Biele	03-05-92
452	Analytical Approximations to Conditional Distribution Functions	T.J. DiCiccio M.A. Martin G.A. Young	04-20-92
453	An Appreciation for Kolmogorov's 1933 Paper	M.A. Stephens	06-15-92
454	On Watson's Anova for Directions	M.A. Stephens	06-22-92

**Defense Department Queries
Leading to Technical Memoranda**

1. Distributions of Functions of Eigenvalues of Random Symmetric Matrices
2. Measures of Homogeneity of Covariance in Pattern Recognition
3. Urn Problem
4. Single Outlier Detection vs. None or Many
5. The Question of Ancillarity when Dealing with the Distribution of Length of Longest Monotone Subsequence
6. Urn Discrimination Problem
7. A Fortran Program to Generate Sequence of Random Variables from an Arbitrary Unimodal Distribution
8. A Bayesian Problem
9. Multivariate Normal Mean Shift Detection
10. Interference and Prediction in Nonparametric Regression
11. Maximum Excursion of a Random Walk
12. Recovering a Specific Distribution from its Moments
13. Speech Clustering Problems
14. Markov Change Points
15. Approaches Based on Multivariate Nonparametric Density Estimation
16. Justification of Non-Gaussian F-like Statistic
17. Simulation Approaches to Estimating Tail Probabilities for the Sum of the k Smallest Chi-square Order Statistics
18. Conditional Distribution of Top $k + l$ Gamma Order Statistics Given the Sum of the Top k
19. Nonstationarity Measures
20. Distribution of Index of Number of Clusters

List of Memoranda

- 91A *Distributions of Functions of Eigenvalues of Random Symmetric Matrices* – Satish Iyengar
- 91H – M.A. Stephens
- 91P *Measures of Homogeneity of Covariance in Pattern Recognition* – Hani Doss & Thomas Sellke
- 91R *Urn Problem* – John Overdeck & Thomas Sellke
- 91V *Single Outlier Detection vs. None or Many* – Satish Iyengar
- 91Y *The Question of Ancillarity when Dealing with the Distribution of Length of Longest Monotone Subsequence* – Hani Doss
- 91Z *Urn Discrimination Problem* – Alan Gelfand
- 90H *A Fortran Program to Generate Sequence of Random Variables from an Arbitrary Unimodal Distribution* – Hani Doss & Deborah Burr
- 90S-3 – Thomas Sellke
- 90S-4 *A Bayesian Problem* – Alan Gelfand
- 90S-5 – Satish Iyengar
- 90S-6 *Multivariate Normal Mean Shift Detection* – Alan Gelfand
- 90S-7 *Interference and Prediction in Nonparametric Regression* – Hani Doss
- 90S-8 *Maximum Excursion of a Random Walk* – Hani Doss
- 90S-10 *Recovering a Specific Distribution from its Moments* – M.A. Stephens
- 89SB-1 *Speech Clustering Problems* – Satish Iyengar
- 89SB-2 *Markov Change Points* – Alan Gelfand
- 89S-3, S-10 *Approaches Based on Multivariate Nonparametric Density Estimation* – Hani Doss
- 89S-4 *Justification of Non-Gaussian F-like Statistic* – Satish Iyengar
- 89S-5 *Simulation Approaches to Estimating Tail Probabilities for the Sum of the k Smallest Chi-square Order Statistics* – Fred Huffer
- 89S-6 *Conditional Distribution of Top $k + l$ Gamma Order Statistics Given the Sum of the Top k* – Hani Doss
- 89S-8 – M.A. Stephens
- 89S-9 *Nonstationarity Measures* – Fred Huffer
- 89S-? *Distribution of Index of Number of Clusters* – Satish Iyengar