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SELECTED BIBLIOGRAPHY ON OPTIMIZING
TECHNIQUES IN STATISTICS.

by

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J. S. RUSTAGI

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Department of Statistics
The Ohio State University
Columbus, Ohio 43210

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19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Bibliography, statistical optimization.		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) A selected list of references is provided in the area of optimization techniques as applied in statistical settings. The bibliography is classified according to various optimization techniques as well as to the kinds of statistical applications. Statistical areas include design of experiments, estimation and tests of hypotheses, least-squares theory, regression analysis, multivariate analysis, sampling, sequential and search procedures, and stochastic approximation methods.		

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Optimizing techniques are extensively used in many areas of science and engineering. Many important problems in business, industry and government are formulated as optimization problems. Topics in optimization constitute an essential area of study in disciplines such as Operations Research, Chemical Engineering, Electrical Engineering, and Economics. Statistical techniques often become applications of optimization. Statistical procedures of estimation such as least squares, maximum likelihood, minimum variance, are associated with optimization by their very description. In other areas of Statistics such as decision theory, design of regression experiments, sampling, and data analysis, optimization plays a central role.

The importance of optimization has been recognized by research workers in statistics and related fields, resulting in conferences and symposia during the past few years. The proceedings of the symposia on Optimizing Methods in Statistics are available in the literature, Rustagi (1971, 1979). Sessions are held on Optimization quite frequently at the national and international meetings of the Operations Research Society of America, Institute of Management Sciences and Institute of Mathematical Statistics. A special issue of a journal on Optimization is also available, Rustagi (1978). A collection of recent research on Optimization in Statistics with special applications in management sciences and operations research is in Rustagi and Zanakis (1981).

Optimizing techniques can be broadly classified as (i) general classical, (ii) numerical, (iii) mathematical programming, and (iv) variational. We provide pertinent references with statistical applications in the above areas in Part I.

Part II of the bibliography will be concerned with various areas of statistics where optimization techniques are applied. We provide references of optimization in the following areas.

- (i) Design of Experiments
- (ii) Estimation and Testing Hypotheses
- (iii) Least Squares Theory
- (iv) Regression Analysis
- (v) Multivariate Analysis
- (vi) Sampling
- (vii) Sequential and Search Procedures
- (viii) Stochastic Approximation Methods.

The search has been made through the most recent statistical literature (the last twenty years).

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