# STATISTICALI SCIENCE

a review journal of the institute of mathematical statistics

Volume 1

Number 2

May 1986

### **Featuring**

I. J. Good on STATISTICAL APPLICATIONS OF POISSON'S WORK

Fred L. Bookstein on

MORPHOMETRICS: SIZE AND SHAPE SPACES

Ronald A. Thisted on COMPUTING ENVIRONMENTS

Tze Leung Lai and David Siegmund on THE CONTRIBUTIONS OF HERBERT ROBBINS

Robert V. Hogg and Cecil C. Craig on EARLY DAYS OF THE IMS

An Interview with ERICH L. LEHMANN

#### **EXECUTIVE EDITOR:**

Morris H. DeGroot Carnegie-Mellon University

#### **EDITORIAL ASSISTANT:**

Tina Lynne Rees

#### **EDITORS:**

David R. Brillinger University of California Berkeley J. A. Hartigan Yale University

Ingram Olkin Stanford University

#### **MANAGING EDITOR:**

Paul Shaman University of Pennsylvania

#### **EDITORIAL ASSISTANT:**

Tammy Morrow

The aim of *Statistical Science* is to present the full range of contemporary statistical thought at a technical level accessible to the broad community of practitioners, teachers, researchers, and students of statistics and probability.

The journal will publish discussions of methodological and theoretical topics of current interest and importance, surveys of substantive research areas with promising statistical applications, comprehensive book reviews, discussions of classic articles from the statistical literature, and interviews with distinguished statisticians and probabilists.

#### SUBMISSION POLICY

Statistical Science welcomes the submission of expository, review, and survey papers in all areas of the theory, methodology, and applications of statistics and probability. Articles that synthesize research that has been published in diverse sources or that has been developed from diverse points of view are especially valuable.

Four nonreturnable copies of any manuscript submitted for consideration are requested for the reviewing process. Copies should be mailed first class to:

Professor Morris H. DeGroot Executive Editor, Statistical Science Department of Statistics Carnegie-Mellon University Pittsburgh, PA 15213

The manuscripts should be typed on  $8\frac{1}{2} \times 11$ -inch white paper, on one side only, and double-spaced throughout, including the references, with margins of at least  $1\frac{1}{2}$  inches on all four sides. Pages should be numbered consecutively. The manuscript should contain an abstract of 200 or fewer words, followed by approximately 5 or 6 key words or phrases. A short author's note providing the name, address, present position or rank, and affiliation of each author should also be included.

A condition of submission is that the manuscript has not previously been published and is not simultaneously being considered for publication elsewhere.

Statistical Science is copyrighted and authors will be asked to sign a copyright transfer to the IMS before publication.

## STATISTICAL SCIENCE

Volume 1,	Number	2
-----------	--------	---

May 1986

In This Issue	155
Some Statistical Applications of Poisson's Work	157
Comment	171
Comment	174
Comment	176
Comment	177
Rejoinder	179
Size and Shape Spaces for Landmark Data in	
Two Dimensions Fred L. Bookstein	181
Comment	222
Comment	226
Comment Gregory Campbell	227
Comment	229
Comment	234
Rejoinder Fred L. Bookstein	238
A Conversation with Erich L. Lehmann	243
Computing Environments for Data Analysis	259
CommentJohn M. Chambers	271
Comment	273
Rejoinder	274
The Contributions of Herbert Robbins to	0770
Mathematical Statistics	276
On the Origins of the Institute of	285
Mathematical Statistics	
Early Days in Statistics at Michigan	292

Statistical Science (ISSN 0883-4237), Volume 1, Number 2, May 1986. Published in February, May, August, and November by the Institute of Mathematical Statistics, 3401 Investment Boulevard #7, Hayward, California 94545. Application to mail at second-class postage rates is pending at Hayward, California and additional mailing offices. Postmaster: Send address changes to Statistical Science, Institute of Mathematical Statistics, 3401 Investment Boulevard #7, Hayward, California 94545.

Copyright © 1986 by the Institute of Mathematical Statistics Printed in the United States of America

#### IMS CORPORATE MEMBERS

THE AEROSPACE CORPORATION Los Angeles, California

AT&T BELL LABORATORIES Murray Hill, New Jersey

BELL COMMUNICATIONS RESEARCH

Morristown, New Jersey

GENERAL MOTORS CORPORATION

Research Laboratories Warren, Michigan INTERNATIONAL BUSINESS MACHINES CORP. Thomas J. Watson Research Center Yorktown Heights, New York

SPRINGER-VERLAG NEW YORK INCORPORATED New York, New York

UNION OIL COMPANY OF CALIFORNIA Brea, California

#### IMS INSTITUTIONAL MEMBERS

ARIZONA STATE UNIVERSITY Dept. of Mathematics Tempe, Arizona

AUSTRALIAN NATIONAL UNIVERSITY Canberra, ACT, Australia

BOWLING GREEN STATE UNIVERSITY Dept. of Mathematics and Statistics Bowling Green, Ohio

CALIFORNIA STATE UNIVERSITY AT FULLERTON Depts. of Mathematics and Management Science Fullerton, California

CASE WESTERN RESERVE UNIVERSITY Dept. of Mathematics and Statistics Cleveland, Ohio

CENTERS FOR DISEASE CONTROL Atlanta, Georgia

CORNELL UNIVERSITY Dept. of Mathematics Ithaca, New York

FLORIDA STATE UNIVERSITY Dept. of Statistics

Tallahassee, Florida

GEORGE WASHINGTON UNIVERSITY Dept. of Statistics Washington, DC

INDIANA UNIVERSITY Dept. of Mathematics Bloomington, Indiana

IOWA STATE UNIVERSITY

Dept. of Statistics and Statistical Laboratory Ames. Iowa

JOHNS HOPKINS UNIVERSITY

Dept. of Biostatistics Baltimore, Maryland

KANSAS STATE UNIVERSITY

Dept. of Statistics Manhattan, Kansas

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Dept. of Mathematics Cambridge, Massachusetts

MIAMI UNIVERSITY
Dept. of Mathematics and S

Dept. of Mathematics and Statistics Oxford, Ohio

MICHIGAN STATE UNIVERSITY Dept. of Statistics and Probability East Lansing, Michigan NATIONAL SECURITY AGENCY Fort George G. Meade, Maryland

NEW MEXICO STATE UNIVERSITY Dept. of Mathematical Sciences Las Cruces, New Mexico

NORTH CAROLINA STATE UNIVERSITY Dept. of Statistics Raleigh, North Carolina

NORTHERN ILLINOIS UNIVERSITY Dept. of Mathematical Sciences DeKalb, Illinois

NORTHWESTERN UNIVERSITY Dept. of Mathematics Evanston, Illinois

OHIO STATE UNIVERSITY Dept. of Statistics Columbus, Ohio

OREGON STATE UNIVERSITY Dept. of Statistics Corvallis, Oregon

PENNSYLVANIA STATE UNIVERSITY Dept. of Statistics University Park, Pennsylvania

PRINCETON UNIVERSITY Dept. of Statistics Princeton, New Jersey

PRINCETON UNIVERSITY LIBRARY Princeton, New Jersey

PURDUE UNIVERSITY LIBRARY West Lafayette, Indiana

QUEEN'S UNIVERSITY Dept. of Mathematics and Statistics Kingston, Ontario, Canada

RICE UNIVERSITY
Dept. of Mathematical Sciences
Houston, Texas

THE ROCKEFELLER UNIVERSITY LIBRARY New York, New York

SIMON FRASER UNIVERSITY Dept. of Mathematics and Statistics Burnaby, British Columbia, Canada

SOUTHERN ILLINOIS UNIVERSITY Dept. of Mathematics, Statistics, and Computer Science Edwardsville, Illinois SOUTHERN METHODIST UNIVERSITY

Dept. of Statistics Dallas, Texas

STANFORD UNIVERSITY

Dept. of Statistics Stanford, California

TEMPLE UNIVERSITY Dept. of Mathematics Philadelphia, Pennsylvania

TEXAS TECH UNIVERSITY Dept. of Mathematics

Lubbock, Texas

UNIVERSITY OF ARIZONA Dept. of Mathematics Tucson, Arizona

UNIVERSITY OF BRITISH COLUMBIA Dept. of Statistics

Vancouver, British Columbia, Canada

UNIVERSITY OF CALGARY Division of Statistics Calgary, Alberta, Canada

UNIVERSITY OF CALIFORNIA Dept. of Statistics Berkeley, California

UNIVERSITY OF CALIFORNIA Division of Statistics Davis, California

UNIVERSITY OF GUELPH Dept. of Mathematics and Statistics Guelph, Ontario, Canada

UNIVERSITY OF ILLINOIS Dept. of Statistics Urbana, Illinois

UNIVERSITY OF ILLINOIS AT CHICAGO Dept. of Mathematics, Statistics, and Computer Science Chicago, Illinois

UNIVERSITY OF IOWA Dept. of Statistics and Actuarial Science Iowa City, Iowa

UNIVERSITY OF MANITOBA Dept. of Statistics Winnipeg, Manitoba, Canada

UNIVERSITY OF MARYLAND Dept. of Mathematics College Park, Maryland

UNIVERSITY OF MASSACHUSETTS Dept. of Mathematics and Statistics Amherst, Massachusetts

UNIVERSITY OF MICHIGAN Dept. of Statistics Ann Arbor, Michigan

UNIVERSITY OF MINNESOTA School of Statistics Minneapolis, Minnesota

UNIVERSITY OF MISSOURI AT COLUMBIA Dept. of Statistics Columbia, Missouri UNIVERSITY OF MONTREAL Dept. of Mathematics Montreal, Quebec, Canada

UNIVERSITY OF NEBRASKA Dept. of Mathematics and Statistics Lincoln, Nebraska

UNIVERSITY OF NEW MEXICO Dept. of Mathematics and Statistics Albuquerque, New Mexico

UNIVERSITY OF NORTH CAROLINA Dept. of Statistics Chapel Hill, North Carolina

UNIVERSITY OF OREGON Dept. of Mathematics Eugene, Oregon

UNIVERSITY OF OTTAWA Dept. of Mathematics Ottawa, Ontario, Canada

UNIVERSITY OF SOUTH CAROLINA Dept. of Statistics Columbia, South Carolina

UNIVERSITY OF STOCKHOLM Institute of Actuarial Mathematics and Mathematical Statistics Stockholm, Sweden

UNIVERSITY OF TEXAS AT AUSTIN Dept. of Mathematics Austin, Texas

UNIVERSITY OF TEXAS AT SAN ANTONIO Div. of Mathematics, Computer Science, and Systems Design San Antonio, Texas

UNIVERSITY OF VICTORIA Dept. of Mathematics Victoria, British Columbia, Canada

UNIVERSITY OF VIRGINIA Dept. of Mathematics Charlottesville, Virginia

UNIVERSITY OF WASHINGTON Depts. of Statistics and Mathematics Seattle, Washington

UNIVERSITY OF WATERLOO Dept. of Statistics and Actuarial Science Waterloo, Ontario, Canada

UNIVERSITY OF WISCONSIN AT MILWAUKEE Dept. of Mathematical Sciences Milwaukee, Wisconsin

VIRGINIA COMMONWEALTH UNIVERSITY Dept. of Mathematical Sciences Richmond, Virginia

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY Dept. of Statistics Blacksburg, Virginia

WAYNE STATE UNIVERSITY Dept. of Mathematics Detroit, Michigan

YORK UNIVERSITY
Dept. of Mathematics
Downsview, Ontario, Canada