Mark H. Hansen

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Education

1989 – 1994 Department of Statistics, University of California at Berkeley
- Ph.D. Degree in Statistics, 1994
  Dissertation Title: *Extended Linear Models, Multivariate Splines and ANOVA*
- M.A. Degree in Statistics, 1991

1987 – 1989 Department of Mathematics, University of California at Berkeley
- M.S. program (transferred to the Statistics Department)

1982 – 1987 Department of Mathematics, University of California at Davis
- B.S. in Applied Mathematics
  Graduated with High Honors

Research Positions

Member of Technical Staff, Bell Laboratories — Summer 1994 – Present

Projects:
- Web statistics, large data bases
- Experiments with sound in support of data analysis
- The practical use of spline spaces for function estimation
- Quality improvement in IC manufacturing

Invited Visiting Research Positions

School of Operations Research and Industrial Engineering, Cornell Univeristy — February – April, 1999
Institute for Statistics and Econometrics, Humboldt-Universität zu Berlin — March, 1997
Australian Graduate School of Management, University of New South Wales — November, 1996

Statistical Consultant, U.S. Department of Commerce — Fall 1991 – Spring 1992

Project: Matters of Census adjustment relating to testimony by Professors K.Wachter and L. Breiman in the case of *New York City, et al. versus the Department of Commerce, et al.*

Summer Intern and Statistical Consultant, AT&T Bell Laboratories — Summers, 1991 & 1992

Projects:
- M-estimation and fractional factorial designs
- Quality improvement in semiconductor manufacturing

Research Assistant, Statistics Department, University of California at Berkeley — Various Semesters, 1990 – 1994

Projects:
- Functional inference and experimental design
- Preliminary analysis of the proposed adjustment procedure for the 1990 Census

Teaching Experience

Teaching Assistant, Statistics Department, University of California at Berkeley — Various Semesters 1989 – 1993

· Courses included Master's Level Probability and Statistics and Graduate Level Applied Statistics

· Received an Outstanding Teaching Award from the Graduate Division of the University of California at Berkeley in May, 1992 (This award is based on both student and instructor evaluations)

Workshop Leader, Minority Engineering Program, University of California at Berkeley — Fall 1987 – Spring 1989

Led workshops for upper division courses in mathematics

Patents

Granted

U.S. Patent No. 6,449,604 — September 2002
Method for characterizing and visualizing patterns of usage of a Web site by network users (II)
with W. Sweldens

U.S. Patent No. 6,424,745 — July 2002
Method and Apparatus for Object Recognition
with H. Hess, P. Mitra, and G. Thomas

U.S. Patent No. 6,182,097 — January 2001
Method for characterizing and visualizing patterns of usage of a Web site by network users (I)
with W. Sweldens

U.S. Patent No. 6,075,594 — June 2000
System and Method for Spectroscopic Product Recognition and Identification
with D. X. Sun and G. Thomas

U.S. Patent No. 5,240,866 — August 1993
A Method for Characterizing Defects in Integrated Circuits
with D. Friedman, J. R. Hoyer and V. N. Nair

Filed

Method for organizing records of database search activity by topical relevance — Filed March 2001
with E. Shriver

System and method for providing interactive dialogue and iterative search functions to find information — Filed September 2000
with K. August, D. Lee and E. Shriver

Publications and Technical Reports

Publications

Nonlinear estimation and classification. Proceedings of an interdisciplinary workshop held in March, 2001, at MSRI in Berkeley, California. D. Denison, M. H. Hansen, C. Holmes, B. Mallick and B. Yu, Eds. (*Publication expected October, 2002*)

Statistical Modeling with Spline Functions: Methodology and Theory. A monograph on the use of polynomial splines and their tensor products in multivariate function estimation, with J. Huang, C. L. Kooperberg, C. J. Stone and Y. Truong (*Publication expected August, 2002*)

M. H. Hansen and C. Kooperberg (2002) "Spline Adaptation in Extended Linear Models,"(with discussion) *Statistical Science*, Vol. 17, No. 1, pp. 2-51.

R. Sen and M. H. Hansen (2002) "Predicting a Web user's next request based on log data," (Based on this paper, R. Sen won the Student Paper Competition sponsored by the ASA Section on Statistical Computing) to appear *JCGS*.

M. H. Hansen and E. Shriver (2001) "Using navigation data to improve IR functions in the context of Web search," *Proceedings of CIKM 2001*.

M. H. Hansen and B. Yu (2001), "Model Selection and the Principle of Minimum Description Length," *JASA*, Vol. 96, No. 454, pp. 746-774.

T. Hermann, M. H. Hansen and H. Ritter (2001) "Sonification of Markov chain Monte Carlo simulations," *Proceedings of ICAD 2001*, Hiipakka, J., Zacharov, N. and Takala, T., Eds., pp. 208-216.

M. H. Hansen and B. Rubin (2001) "Experiencing information systems through sound," *Proceedings of ICAD 2001*, Hiipakka, J., Zacharov, N. and Takala, T., Eds., pp 10-15.

B. Rubin and M. H. Hansen (2001), "Yahoo/Bounce," on *State of the Union, 2001*, produced by Elliot Sharp, Electronic Music Foundation, Inc. (Invited contribution to a 3-disc set, with profits going to the National Coalition Against Censorship)

K. August, M. H. Hansen and E. Shriver (2001) "Mobile Web Searching," to appear in the *Bell Labs Technical Journal*.

M. H. Hansen and B. Yu (2000), "Wavelet Thresholding via MDL: Simultaneous Denoising and Compression," *IEEE Tranasctions on Information Theory*, Vol. 45, No. 5, pp. 1778-1788.

V. N. Nair, M. H. Hansen and J. Shi (2000), "Statistics in Advanced Manufacturing," (Year 2000 Commemorative Vignette on Engineering and the Physical Sciences), *JASA*, Vol. 95, No. 451, pp. 1002-1005.

M. H. Hansen and B. Rubin (2000), "The audiences would be the artists and their life would be the arts," *IEEE Multi-Media*, Vol. 7, No. 2, pp. 6-9.

O. Patterson and M. H. Hansen (2000) "The impact of tolerance on kill ratio estimation for memory," *Proceedings of 2000 IEEE/SEMI Advanced Semiconductor Manufacturing Conference & Workshop (ASMC)*.

O. Patterson, M. H. Hansen, and T. Henry (1999), "Spatial Analysis of Defect and Electrical Test Wafer Maps for Yield Limiting Defect Reduction," Proc. SEMATECH, May 19, 1999.

M. H. Hansen and B. Yu (1999), "Bridging AIC and BIC: An MDL Model Selection Criterion," IT Workshop on Detection, Estimation, Classification and Imaging, February, 1999.

M. H. Hansen and B. Yu (1999), "Assessing MDL in Wavelet Denoising and Compression," ITW 1999.

M. H. Hansen, C. Kooperberg and S. Sardy (1998), "Triogram Models " *JASA*, Vol. 93, pp. 101–119.

J. M. Chambers, M. H. Hansen, D. A. James and D. Temple Lang (1998), "Distributed Computing with Data: A CORBA-Based Approach," *Computing Science and Statistics*, Vol. 30, pp. 518–525.

C. Stone, M. H. Hansen, C. Kooperberg, Y. Truong (1997), "Polynomial Splines and Their Tensor Products in Extended Linear Modeling," (with discussion), *The Annals of Statistics*, Vol. 25, No. 4, pp. 1371–1470.

M. H. Hansen, V. Nair and D. Friedman (1997), "Monitoring Wafer Map Data from Integrated Circuit Fabrication Processes for Spatially Clustered Defects," *Technometrics* Vol. 39, No. 3. (Chosen for the *Technometrics* Invited Session at the Fall Technical Conference in Baltimore, Maryland, 1997).

D. Friedman, M. H. Hansen, V. Nair and D. James (1997), "Model-free estimation of some yield metrics in integrated circuit manufacturing," *IEEE Transactions on Semiconductor Manufacturing*, Vol. 10, No. 3.

M. H. Hansen and D. James (1997), "A Computing Environment for Spatial Data Analysis in the Microelectronics Industry," *Bell Labs Technical Journal*, Vol. 2, No. 1, pp. 114–129.

M. H. Hansen and V. Nair (1996), "Process and Productivity Improvement in Semiconductor Manufacturing," *Computing Science and Statistics*, Vol. 27, pp. 3–7.

Other Papers & Technical Reports

M. H. Hansen, V. N. Nair and D. Friedman, "Process Improvement Through the Analysis of Spatially Clustered Defects on Wafer Maps," submitted to *JASA*.

M. H. Hansen, D. James (1995), "Extending Wafer Space: Tencor Particle Scans and Bitmaps," Bell Laboratories Technical Memorandum.

M. H. Hansen, D. James and D. Pregibon (1995), "Tools for Spatial Data Analyses in Integrated Circuit Manufacturing," Bell Laboratories Technical Memorandum.

M. H. Hansen (1994), "Extended Linear Models, Multivariate Splines and ANOVA," Ph.D. Dissertation, University of California at Berkeley.

M. H. Hansen and K. Wachter (1991), "Report on CAT Experiments," Report No. 362, Statistics Department, UC Berkeley. (Entered as evidence for the case of *New York City, et al. versus the Department of Commerce, et al.*)

Professional Service

Editorial service

Associate Editor, *Journal of the American Statistical Association* January, 1999 – Present

Associate Editor, *Technometrics* October, 1998 – Present

Co-Editor, *Statistical Computing and Graphics Newsletter* 1996 – 2000

Served as a referee for the *Annals of Statistics*, *Journal of the American Statistical Association*, *Journal of the Royal Statistical Society*, *Journal of Computational and Graphical Statistics*, *Technometrics*, *IEEE Transactions on Information Theory*, and the *Scandinavian Journal of Statistics*.

Elected positions

2001 Chair, Statistical Computing Section of the American Statistical Association

1999 JSM Program Chair, Statistical Computing Section of the American Statistical Association

Conference Organization

Program committee, *Workshop on Complexity and Inference* Academic year 2001-2002
DIMACS Special Year on Computational Information Theory and Coding

Organizer, *Modern Statistical Computing and Graphics in Academia* Spring 2001
One day workshop to explore how best to promote and sustain the field of Statistical Computing.

Organizer, *Nonlinear Estimation and Classification* Spring 2001
A two-week workshop held at the Mathematical Sciences Research Institute (Berkeley, CA) emphasizing cross-disciplinary approaches to modeling large, complex data.

Program committee, *12th International Conference on Scientific and Statistical DBM* July 2000

Program committee, *Joint Statistical Meetings, Section on Statistical Computing* August 1999

Organizer, *Statistical Science and the Internet* July 1998
A mini-conference designed to explore the impact that emerging Internet-related tools will have on the way we communicate statistical ideas.

Member, *IMS committee on New Researchers* 1994 – 1995

Web Sites

Designer and Web master for `www.statcomputing.org` August, 2000 - Present
The homepage for the ASA Section on Statistical Computing

Grants and Awards

Rockefeller Foundation Grant — September, 2002
In support of *Listening Post*, a ten-week installation at the Whitney Museum of American Art

Rockefeller Foundation Grant — May, 2001
In support of *Listening Post*, a two-week installation at the Brooklyn Academy of Music

Arts in Multimedia Award — January, 2000
· Awarded for *Ear to the Ground*, a joint collaboration with sound artist Ben Rubin, EAR Studio
· Sponsored by the Brooklyn Academy of Music and Lucent Technologies

Co-Principal Investigator, National Science Foundation DMS Grant — 1998-2000
Title: Satistical Methods for Process Control and Improvement in Advanced Manufacturing

Invited Talks

Distinguished Invited Speaker Series in Computer Science, UBC — October, 2002

BRIDGES Consortium Two, Banff New Media Institute — October, 2002
Theme: Cross-Disciplinary Research
Invited Participant

IMS Meeting on Mixture Models, Cleveland, OH — June, 2002
Invited talk: Mixtures in telecommunications applications

Spring Research Conference on Statistics in Industry and Technology, Ann Arbor, MI — May, 2002
Invited talk: Data streams

Free Space Symposium, Duke University — February, 2002
Invited panelist discussing the institutional support required for successful Art & Science Collaborations

Next Wave 2001, Brooklyn Academy of Music — December 2001
Listening Post, a two-week installation rendering in real time thousands of simultaneous conversations on the Web

ArtSci2001, Symposium organized by Art & Science Collaborations — November 2001
Invited talk on *Listening post* installation

Invited Seminar, UC Davis, Department of Statistics — October 2001

Invited Seminar, Rutgers University, Department of Statistics — October 2001

Invited Seminar, Columbia University, Department of Statistics — October 2001

Invited Seminar, Iowa State University, Department of Statistics — October 2001

Invited Seminar, Carnegie Mellon University, Department of Statistics — September 2001

2001 Joint Statistical Meetings of the ASA, Baltimore, MD — August 2001
Organized Invited Session: *Multisensory Data Representation and Exploration*

33rd Symposium on the Interface: Computing Science and Statistics, Costa Mesa, CA — June 2001
Invited Talk: *Sound as a tool for data analysis*

Digital H@ppy Hour, The Kitchen, NYC — April 2001
Sounds of the New, invited presentation with Ben Rubin

Statistical Methodologies in Business Research Conference — April 2001
Invited Talk: *M-commerce traffic analysis for usability assessment and services creation*

Search Engines: Diversity and Controversy, The Sixth Search Engine Meeting — April 2001
Invited Talk: *The Information Hidden When Web Searching*

Blur: New Creative Practices Within Developing Technologies — January 2001
Invited seminar series sponsored by Creative Time and Thundergulch, hosted by The New School
Presentation Title: *Experiencing Information Systems Through Sound*

National Academy of Sciences, Committee on Information Technology and Creativity — November 2000
Invited Talk: *Art-Technology Collaborations*

34th Annual Conference on Information Sciences and Systems, Princeton University — March 2000
Invited Talk: *Uncovering Complexity in Data through Sound*

1999 Joint Statistical Meetings of the ASA, Baltimore, MD — August 1999
Organized Invited Session: *Practical Smoothing*

1999 Joint Statistical Meetings of the ASA, Baltimore, MD — August 1999
Title: *ASA and the Web*

Invited Seminar, New Jersey Institute of Technology — October 1998

4th ICSA Statistical Conference, Kunming, China — August 1998
Invited Talk: *Statistics in Advanced Manufacturing*

1998 Joint Statistical Meetings of the ASA, Dallas, Texas — August 1998
Invited Talk: *Extended Linear Modeling and the Principle of Minimum Description Length*

Invited Seminar, University of Michigan, Department of Statistics — April 1998

Invited Seminars, Cornell University, Department of ORIE and Statistics Department — March 1998

Fall Technical Conference, Baltimore, Maryland — October 1997
Invited Talk: *Monitoring Wafer Map Data from IC Fabrication Processes for Spatially Clustered Defects*
Technometrics Invited Session

1997 Joint Statistical Meetings of the ASA, Anaheim, California — August 1997
Title: *Adaptive Knot Splines*

1997 Joint Statistical Meetings of the ASA, Anaheim, California — August 1997
Organized Invited Session: *Computational Science and the Internet*

Joint Research Conference on Statistics in Industry and Technology, New Brunswick, NJ — June 1997
Organized Invited Session: *Semiconductor Yield Modeling*

Invited Seminar, The Wharton School, University of Pennsylvania — April 1997

21. Jahrestagugg der Gesellschaft für Klassifikation e.V., Potsdam, Germany — March 1997
Invited Talk: *Spline Adaptation in Extended Linear Models*

Invited Seminar, Weierstrass Institute for Applied Analysis and Stochastics — March 1997

Invited Seminar, University of California at Berkeley Department of Statistics — November 1996

Invited Seminar, Rutgers University Department of Statistics — September 1996

1996 Joint Statistical Meetings of the ASA, Chicago, Illinois — August 1996
Title: *Data Analysis and the Web*

Invited Seminar, University of Illinois at Urbana-Champaign Department of Statistics — April 1996

Invited Seminar, University of Washington Department of Statistics — February 1996

IMS WNAR, Stanford, California — June 1995
Invited Talk: *Bivariate function estimation via spline spaces defined over adaptively constructed triangulations*

27th Symposium on the Interface: Computing Science and Statistics, Philadelphia, PA — June 1995
Invited Talk: *Process and Productivity Improvement in Semiconductor Manufac turing*

Quality and Productivity Research Conference, Phoenix, Arizona — May 1995
Invited Talk: *Strategies for Process and Productivity Improvement in IC Ma nufacturing*

Spring Research Conference on Statistics in Industry and Technology, Chapel Hill, NC — June 1994
Invited Talk: *Quality and Productivity Improvement in Integrated Circuit Fa brication*

1993 Joint Statistical Meetings of the ASA, San Francisco, California — August 1993
Invited Talk: *Quality Improvement in Integrated Circuit Fabrication Through Spatial Analysis of Wafer Map Data*

ORSA/TIMS Meeting, San Francisco, California — November 1992
Invited Talk: *Process Improvement through Statistical Modeling and Data Analysis: An Application to IC Fabrication*

Press

Making an Opera From Cyberspace's Tower of Babel, by Matthew Mirapaul, *New York Times*, December 10, 2001
Archive copy at `http://www.nytimes.com/2001/12/10/arts/music/10ARTS.html`

In January, Listening Post was featured on *Studio 360*, a production of Public Radio International and WNYC.
Archive copy at `http://www.wnyc.org/new/Studio360/show012602.html`