

Curriculum Vitae of Werner Stuetzle

Address

2125 1st Ave #1902
Seattle, WA 98121
(206) 770-9566 (home)
(206) 685-7431 (office)
wxs@stat.washington.edu
www.stat.washington.edu/wxs

Personal Data

Born: September 14, 1950
Citizenship: German
US residence permit
Single, no children

Education

Study of Mathematics and Physics	
Heidelberg University	1969–71
Swiss Federal Institute of Technology	1971–73

Degrees

Master's degree in Mathematics	1973
Ph.D. in Mathematics (Adviser: P.J. Huber)	1977
Thesis title: Estimation and Parametrization of Growth Curves.	

Positions

Assistant Professor, Department of Statistics, Stanford University, with a joint appointment with the Computation Research Group of the Stanford Linear Accelerator Center (on sabbatical leave during academic year 1981 – 82).	1978–83
Visiting Professor, Department of Applied Mathematics and Center for Computational Research in Economics and Management Science, MIT.	1981–82
Research Staff Member, IBM Zurich Research Laboratory.	1983–84
Associate Professor, Department of Statistics, and Adjunct Associate Professor, Department of Computer Science, University of Washington.	1984–92
Professor, Department of Statistics, and Adjunct Professor, Department of Computer Science, University of Washington.	1992–
Chair, Department of Statistics, University of Washington.	1994–02
Sabbatical, AT&T Labs - Research	1999–00
Acting Chair, Department of Statistics, University of Washington.	2004–05
Director, ACMS program, University of Washington.	2005–
Divisional Dean of Natural Sciences, University of Washington	2006–

Research Interests

Statistical applications of computer graphics; three-dimensional photography; machine learning.

Grants and Contracts

Projection Pursuit Methods for Graphical Data Analysis (with J.H. Friedman). 1981–84

Funded by the Department of Energy, the Office of Naval Research, and the Army Research Office.

Total amount: more than \$100,000.

Nonparametric Methods in Multivariate Analysis (with A. Buja). 1985–88

Funded by the National Science Foundation.

Total amount: \$106,427

Nonparametric Methods in Multivariate Analysis (with A. Buja, J.A. McDonald). 1985–88

Funded by the Department of Energy.

Total amount: \$767,799

Nonparametric Methods in Multivariate Analysis (with F. O’Sullivan, J.A. McDonald). 1988–91

Funded by the Department of Energy.

Total amount: \$721,312

Curve and Surface Reconstruction from Unorganized Data (with T. DeRose, J.A. McDonald). 1991–94

Funded by the National Science Foundation.

Total amount: \$350,000

Fish School Acoustics (with G. Swartzman). 1991–93

Funded by the Office of Naval Research.

Total amount: \$198,000

Data Visualization Using Focusing and Linking (with J.A. McDonald). 1992–94

Funded by the National Science Foundation.

Total amount: \$118,000

3d Scanning: from Physical Objects to Electronic Models (with T. DeRose, T. Duchamp, J.A. McDonald). 1994–97

Funded by the National Science Foundation.

Total amount: \$290,000

Improved Calibration Methods 1995–97

Funded by the Center for Process Analytical Chemistry.

Total amount: \$40,000

<i>3d Scanning: Acquiring and Modeling Surface Properties</i> (with B. Curless and T. Duchamp). Funded by the National Science Foundation. Total amount: \$406,000	1998–01
<i>Statistical Problems</i> Funded by the National Security Agency. Total amount: \$150,000	2002–05
<i>Nonparametric Cluster Analysis</i> Funded by the National Science Foundation. Total amount: \$169,000	2005–08
<i>Statistical Problems</i> Funded by the National Security Agency. Total amount: \$352,000	2005–10
<i>Change point detection in multivariate data streams</i> (with Don Percival) Funded by ONR. Total amount: \approx \$500,000	2005–08

Service to the Profession

Organizer, Stanford Workshop on Advanced Statistical Graphics	1982
Associate Editor, Journal of the American Statistical Association	1983–86
Associate Editor, Special Section on Graphics, Journal of the American Statistical Association	1986
Organizer, AMS–IMS–SIAM Summer Research Conference on Large Scale Data Analysis via Computer Graphics (with A. Buja)	1986
Participant in the Workshop on the Use of Computers in Statistical Research	1986
Member, ad hoc committee for a Journal of Computational and Graphical Statistics	1987
Program Chair, Statistical Graphics Section, American Statistical Association	1990
Chair elect, Statistical Graphics Section, American Statistical Association	1991
Chair, Statistical Graphics Section, American Statistical Association	1992
Member, Visualization 'xx program committee	1988–00
Organizer, IMA workshop on “3D Scanning: From Physical Objects to Computer Models”.	1996

Member, NSF Math Sciences Career Awards panel	2001
Participant and discussant, NAS workshop on “The Role of the Mathematical Sciences in Homeland Defense”	2002
Participant and plenary speaker, NSF sponsored workshop on “Statistics: Challenges and Opportunities for the 21st Century”.	2002
Member, program committee, KDD	2002–05
Member, program committee, SIAM International Conference on Data Mining	2005
Associate Editor, Statistics and Computing	2004–06

Service to the University

Statistics Department liaison to the Olympus project	1985–87
Member of the oversight committee for the Math Sciences Computing Center	1987–90
Member of the Academic Senate	1987–88
Organizer, inter-departmental seminar on scientific computing and visualization (with Tony DeRose)	1990
Member, steering committee for new inter-departmental major in Applied and Computational Mathematical Sciences	1996–99
Chair, faculty committee conducting five year performance review of Ed Lazowska, Chair of Computer Science and Engineering	1998
Chair, Chair Search Committee, Department of Computer Science and Engineering	2001
Chair, faculty committee conducting 10-year review of the Department of Electrical Engineering	2002
Chair, faculty committee conducting 10-year review of the Department of Mathematics	2004
Chair, Chair Search Committee, Department of Astronomy	2006

Consulting Experience

U.S. Geological Survey; David F. Herring, Inc.; AT&T Bell Laboratories; Northwest and Alaska Fisheries Center; Bell Communications Research; Statistical Sciences, Inc.; Abbott Research; The Research Group; AT&T Research. Soliloquy, Inc; Amazon.com

Teaching Experience

Numerous Courses on the undergraduate and graduate levels (Applied Statistics, Experimental Design, Statistical Computing, Statistics for Engineers, Curve and Surface Reconstruction, Pattern Recognition, etc).

Principal Lecturer in two shortcourses on New Multivariate Methods in Statistics, sponsored by the German Mathematical Association (with P.J. Huber).

Blalock Lecturer in ICPSR Summer Program, Ann Arbor, 1991–2000.

Chair of Ph.D. Committee

John McDonald (1982)

Trevor Hastie (1984)

Deborah Donnell (1987)

John Michalak (degree awarded posthumously, 1990)

Chisheng Huang (1992)

Steve McKinney (1995)

Sylvain Sardy (1998)

Jeremy Tantrum (2003)

Rebecca Nugent (2006)

Member of Ph.D. Committee

Keith Knight; Robert Gentleman; Catherine Hurley; Lars Andersen; Jeff Banfield; Hugues Hoppe (CSE); Charles Loop (CSE); Georges Winkenbach (CSE); Michael Sannella (CSE); Ken Thornton (EE); Jean Schweitzer (CSE); Jaekyu Ha (EE); Jas Suri (EE); Xufei Liu (EE); Christian Roehr (EE); Michelle Keim; Greg Chiou (EE); Ranjan Maitra; Kari Pulli (CSE); Simon Byers; Angshu Saha; Derek Stanford; Greg Arden (Math); Quing Ji (EE); Kingshuk Choudhury; Greg Ridgeway; Nilanjan Chatterjee; Jacob Wegelin; Mingzhou Song (EE); Daniel Wood (CSE); Ming Ye (EE); Heiko Bailer (Stat); Yeping Su (EE); Susan Shortreed (Stat); Nema Dean (Stat); Qunhua Li (Stat); Heiko Bailer (Stat); Nema Dean (Stat); Brett Allen (CSE).

Invited Presentations at Conferences

Biometrisches Colloquium der Deutschen Region der Internationalen Biometrischen Gesellschaft, Wuppertal, March 1-3, 1978. *Splineglättung und Alternativen*.

Workshop on Smoothing Techniques for Curve Estimation, Heidelberg, April 2-4, 1979. *Some comments on the asymptotic behaviour of robust smoothers*.

IMS Western Regional Meeting, Los Angeles, June 26-28, 1979. *Asymptotics of running M -estimates*.

IMS Special Topics Meeting on Splines and Approximation Theory, Boulder, October 25-26, 1979. *Multidimensional additive spline approximation*.

ARO Workshop on Recent Developments in Modern Data Analysis, North Carolina State University, Raleigh, June 2-4, 1980. *Projection pursuit methods for statistical data analysis*.

Spring Meetings of the Eastern North American Region of the Biometric Society, Richmond, March 22-25, 1981. *Projection pursuit classification*.

SIAM National Meeting, Troy, June 8-10, 1981. *Kinematic graphics for data analysis*.

Third Annual Conference and Exposition of the National Computer Graphics Association, Anaheim, June 13-17, 1982. *An introduction to real time graphical techniques for analyzing multivariate data*.

Joint Statistical Meetings, Cincinnati, August 16-19, 1982. *Interactive projection pursuit on the Orion-1 graphics workstation*.

Statistical Image Processing and Graphics Workshop, Luray, Virginia, May 24-27, 1983. *Interactive real time graphics for multivariate data analysis*.

Annual Meeting of the Statistical Society of Canada, Vancouver, June 5-8, 1983. *Real time color graphics for data analysis*.

IBM Europe Institute, Session on Digital Image Processing, Grassau, July 4-8, 1983. *A workstation for real-time graphics*.

Annual Meeting of the German Statistical Association, Wuppertal, September 26-30, 1983. *Graphical exploration of multivariate data on the computer*.

AMS-IMS-SIAM Joint Summer Research Conference on New Multivariate Methods in Statistics, Bowdoin College, Brunswick, June 10-16, 1984. *Projection pursuit density estimation*.

ASA Annual Meeting, Philadelphia, August 13-16, 1984. Discussion of *Brushing a scatterplot matrix: high interaction computer graphics for data analysis*, by Richard Becker and William S. Cleveland.

Third Conference on Scientific Applications of Statistical Software, Munich, March 4-6, 1985. *Real-time graphics for data analysis*.

Annual Meeting of the National Computer Graphics Association, Dallas, March 15-17, 1985. Discussion of *Graphical methods for regression diagnostics* by Lorraine Denby.

Annual Spring Symposium of the Northern New Jersey Chapter of the ASA, Morristown, May 5, 1986. *High interaction graphics*.

AMS-IMS-SIAM Summer Research Conference on Large Scale Data Analysis via Computer Graphics, Santa Cruz, June 29 – July 3, 1986. *Plot windows*.

Joint Statistical Meetings, Chicago, August 18 – 21, 1986. *Plot windows*.

Interface Meeting, Philadelphia, March 9 – 11, 1987. *Scientific computing in a Lisp environment.*

Annual Conference and Exhibition of the National Computer Graphics Association, Philadelphia, March 23 – 26, 1987. *New graphical techniques for regression analysis.*

ORSA–TIMS Meeting, New Orleans, May 4 – 6, 1987. *Analysis of associations between views of a data set.*

ASA Annual Meeting, New Orleans, August 22 – 25, 1988. *Analysis of fish abundance in the Bering Sea: a case study in the use of graphical methods.*

CBMS Research Conference on Computer-Intensive Methods, Washington DC, June 12 – 16, 1989. *Statistical graphics.*

IMA conference on Robustness, Diagnostics, Computing, and Graphics in Statistics, Minneapolis, July 10 - September 1, 1989. *Examining associations between views of a data set.*

IMA conference on Robustness, Diagnostics, Computing, and Graphics in Statistics, Minneapolis, July 10 - September 1, 1989. *A comparison between Lisp and S.*

Conference on Human Factors in Computing Systems, Seattle, April 1-5, 1990. *Jeepers: an interface perception research tool.* Invited Poster (with S. Weghorst).

Conference on Human Factors in Computing Systems, Seattle, April 1-5, 1990. *Painting multiple views: an interactive technique for “feeling” the shape of complex, multi-dimensional data.* Invited Poster (with J.A. McDonald, A. Buja).

IMS/WNAR Western Regional Meetings, Bozeman, June 17-20, 1990. *Analysis of fish abundance in the Bering Sea: a case study in the use of graphical methods.*

ASA Annual Meeting, Anaheim, August 5 – 9, 1990. *Tools for tree-based models.*

SoftStat '91 Conference on the Scientific Use of Statistical Software, Heidelberg, April 7–12, 1991. *Focusing and linking as paradigms for the visualization of high-dimensional data and other complex objects.*

Workshop on Size and Complexity in Information Worlds at CHI '91, April 28-29, 1991, New Orleans, LA. *Data visualization using focusing and linking.*

Conference on Total Least Squares, Louvain, August 12–16, 1991. *Principal curves.*

Seminar on Scientific Visualization, Schloss Dagstuhl, August 26–30, 1991. *Focusing and linking as paradigms for the visualization of high-dimensional data and other complex objects.*

Second SIAM Conference on Geometric Design, Tempe, November 4-8, 1991. *Least squares fitting of simplicial surfaces to scattered data.*

Annual Meeting of the German Classification Society, Dortmund, April 1992. *Reconstruction of two-dimensional manifolds from scattered data.*

SCIE's OE/Technology '92, Boston, November 15-20, 1992. *Fitting surfaces to scattered data.*

SoftStat '93 Conference on the Scientific Use of Statistical Software, Heidelberg, March 15-18, 1993. *Visualizing speech signals and Hidden Markov models.*

ASA Annual Meeting, San Francisco, August 8-12, 1993. *Manifold reconstruction: a problem on the boundary between Statistics and Computer Science.*

Statistical Society of Canada Annual Meeting, Banff, May 8-11, 1994. *Piecewise smooth surface reconstruction.*

Workshop on Robust Statistics, Data Analysis and Computer Intensive Methods, Bayreuth, June 11-12, 1994. *Piecewise smooth surface reconstruction.*

ASA Annual Meeting, Toronto, August 13-18, 1994. *Fitting manifolds to scattered data.*

COMPSTAT '94 Satellite Meeting on Smoothing, Semmering, August 27-28, 1994. *Fitting 2-dimensional manifolds with subdivision surfaces.*

ASA Annual Meeting, Orlando, August 14-17, 1995. *Visualization beyond points and lines.*

Interface Meeting, Sidney, July 8-10, 1996. *Algorithmic Aspects of Shape Photography.*

Muenchner Stochastik Tage, UniBw Muenchen, March 24-27, 1998. *Estimation and Modeling Problems in Computer Graphics.*

Second International Conference on 3-D Digital Imaging and Modeling, Ottawa, October 4-8, 1999. *Automatic Body Measurement for Mass Customization of Garments.*

International Conference on Scientific and Statistical Database Management, Berlin, July 26-28, 2000. *Unsupervised Learning: Statistical and Computational Perspectives* (Invited Lecture.)

Splus Users Meeting, Seattle, October 18-20, 2000. *Unsupervised Learning: Statistical and Computational Perspectives* (Keynote Lecture.)

GAMM 2001 Annual Meeting, Zurich, February 12-15, 2001. *Mathematical Aspects of 3D Photography* (Public Lecture.)

Magdeburger Stochastik Tage, Magdeburg, March 19-22, 2002. *Some Theory for Bagging.*

IMS Annual Meeting, Banff, July 28-31, 2002. *Bagging with or without Replacement?*

Workshop on Regularization in Statistics, Banff, September 6-11, 2003. *Spline Smoothing on Surfaces.*

DIMACS Working Group on the Mathematics of Web Search and Meta-Search, Bertinoro International Center for Informatics, June 19 - 26, 2004. Invited discussant.

IPAM MGA Workshop III: Multiscale structures in the analysis of high-dimensional data, October 25 - 29, 2004. *Estimation/approximation problems in 3D photography* (with Tom Duchamp).

Joint Annual Meeting of the Interface and the Classification Society of North America, St. Louis, Missouri, June 8 -12, 2005. *Estimating the cluster tree of a density*.

Joint Statistical Meetings, Seattle, August 3 - 10, 2006. *Density based clustering*.

Refereed Publications

Longitudinal study of bowel and bladder control by day and at night during the first six years of life (with R. Largo). *Developmental Medicine and Child Neurology*, Vol. 19, No. 5, October 1977, pp. 598-606, 607-613.

Analysis of the adolescent growth spurt using smoothing spline functions (with R. Largo, Th. Gasser, A. Prader, P.J. Huber). *Annals of Human Biology*, Vol. 5, No. 5, 1978, pp. 421-434.

Shape-invariant modelling of human growth (with R. Largo, Th. Gasser, P.J. Huber, A. Prader). *Annals of Human Biology*, Vol. 7, No. 6, 1980, pp. 507-528.

Projection pursuit regression (with J.H. Friedman). *Journal of the American Statistical Association*, Vol 76, 1981, pp. 817-823.

Multidimensional additive spline approximation (with J.H. Friedman, E.H. Grosse). *SIAM Journal on Scientific and Statistical Computing*, Vol 4, 1983, pp. 291-301.

Projection pursuit density estimation (with J.H. Friedman, A. Schroeder). *Journal of the American Statistical Association*, Vol 79, 1984, pp. 599-608.

Plot windows. *Journal of the American Statistical Association*, Vol. 82, 1987, pp. 466-475.

Principal curves (with T. Hastie). *Journal of the American Statistical Association*, Vol. 84, 1989, pp. 502-516.

Painting multiple views of complex objects (with J.A. McDonald, A. Buja). *SIGPLAN Notices*, Vol. 10, 1990, pp. 245-257.

Interactive data visualization using focusing and linking (with A. Buja, J.A. McDonald, and J. Michalak). *Proceedings of Visualization '91*, Oct 21-25, 1991, San Diego, CA.

Visualization of complex data (with A. Buja, J.A. McDonald, J. Michalak, and S. Willis). 17 minute video tape. *Video Proceedings of Visualization '91*, Oct 21-25, 1991, San Diego, CA.

Surface reconstruction from unorganized points (with H.Hoppe, T. DeRose, T. Duchamp, and J.A. McDonald). *Computer Graphics*, Vol. 26, 1992, (SIGGRAPH '92 Proceedings), pp. 71-78.

Mesh optimization (with H.Hoppe, T. DeRose, T. Duchamp, and J.A. McDonald). Computer Graphics, Vol. 27, 1993, (SIGGRAPH '93 Proceedings), pp. 19–26.

Piecewise smooth surface reconstruction (with H.Hoppe, T. DeRose, T. Duchamp, M. Halstead, H. Jin, J.A. McDonald, and J. Schweitzer). Computer Graphics, Vol. 28, 1994, (SIGGRAPH '94 Proceedings), pp. 295–302.

Analysis of additive dependencies and concavities using smallest additive principal components (with A. Buja and D. Donnell). Discussion paper, Annals of Statistics, Vol. 22, 1994, pp. 1635-1673.

Relating the distribution of Pollock schools in the Bering Sea to environmental factors (with G. Swartzman, K.Kulman, and M. Powojowski). ICES Journal of Marine Science, Vol. 51, 1994, pp. 481–492.

Modeling the distribution of fish schools in the Bering Sea: morphological school identification (with G. Swartzman, K. Kulman, and N. Wen). Natural Resource Modeling, Vol. 8, No. 2, 1994, pp. 177–194.

Multiresolution analysis of arbitrary meshes (with M. Eck, T. DeRose, T. Duchamp, H. Hoppe, and M. Lounsbery). Computer Graphics, Vol. 29, 1995 (SIGGRAPH '95 Proceedings), pp. 173–182.

Extremal properties of principal curves in the plane (with T. Duchamp). Annals of Statistics, Vol. 24, No. 4, 1996, pp. 1511 - 1520.

Interactive multiresolution surface viewing (with Andrew Certain, Jovan Popovic, Tony DeRose, and Tom Duchamp). Computer Graphics, Vol. 30, 1996 (SIGGRAPH '96 Proceedings), pp. 91–98.

Robust meshes from multiple range maps (with K. Pulli, T. Duchamp, H. Hoppe, J.A. McDonald, L. Shapiro). Proceedings of the International Conference on Recent Advances in 3-D Digital Imaging and Modeling, Ottawa, May 12-15, 1997, pp. 205–211.

Surface modeling and display from range and color data (with K. Pulli, M. Cohen, T. Duchamp, H. Hoppe, J. McDonald, and L. Shapiro.) International Conference on Image Analysis and Processing, ICIAP '97, Florence, Italy. Published in Lecture Notes in Computer Science 1310, Springer-Verlag, Berlin, 1997, pp. 385-397.

View-based rendering: visualizing real objects from scanned range and color data (with K. Pulli, M. Cohen, T. Duchamp, H. Hoppe, L. Shapiro). Proceedings of the 8th Eurographics Workshop on Rendering, June 1997, pp. 23–34.

Variable-resolution bivariate plots (with C. Huang, J.A. McDonald). Journal of Computational and Graphical Statistics, Vol. 6, No. 4, 1997, pp 383–396.

Acquisition and visualization of colored 3D objects (with K. Pulli, H. Abi-Rached, T. Duchamp, and L. Shapiro). Proceedings of The 14th International Conference on Pattern Recognition, Brisbane, Australia, August 1998, pp. 11–15.

Wavelet shrinkage for unequally spaced data (with S. Sardy, D.B. Percival, A.G. Bruce, and H. Gao). *Statistics and Computing* 9, 1999, pp. 65–75.

Wavelet denoising: a comparison of subset-selection and ensemble methods (with A. Bruce, H.Y. Gao). *Statistica Sinica*, Vol. 9, No. 1, 1999, pp. 167–182.

Automatic body measurement for mass customization of garments (with A. Certain). *Proceedings of the Second International Conference on 3-D Digital Imaging and Modeling*, 1999, pp. 405–412.

Surface light fields for 3D photography (with D.N. Wood, D.L. Azuma, K. Aldinger, B. Curless, T. Duchamp, D.H. Salesin). *Computer Graphics*, Vol. 34, 2000 (SIGGRAPH '2000 Proceedings), pp. 287–296.

A statistical, nonparametric methodology for document degradation model validation (with T. Kanungo, R.M. Haralick, H.S. Baird, D. Madigan). *IEEE Trans. on PAMI*, Vol. 22, No. 11, 2000, pp. 1209–1223.

John Tukey's work on interactive graphics (with J.H. Friedman). To appear, *Annals of Statistics*.

Spline smoothing on surfaces (with Tom Duchamp). *Journal of Computational and Graphical Statistics*, Vol. 12, No. 3, 2003, pp. 354–381.

Hierarchical model-based clustering of large datasets through fractionation and refractionation (with J. Tantrum and A. Murua). *Proceedings of the 8th International Conference on Knowledge Discovery and Data Mining (KDD02)*, 2002, pp. 183–190.

Estimating the cluster tree of a density by analyzing the minimal spanning tree of a sample. *Journal of Classification*, Vol. 20, No. 5, 2003, pp. 25–47.

View-dependent refinement of multiresolution meshes with subdivision connectivity (with D. Azuma, D. Wood, B. Curless, T. Duchamp, and D. Salesin). *Proceedings of the 2nd International Conference on Computer Graphics, Virtual Reality, Visualisation and Interaction in Africa*, 2003, pp. 69–78.

Assessment and pruning of hierarchical model-based clustering (with J. Tantrum and A. Murua). *Proceedings of the 9th International Conference on Knowledge Discovery and Data Mining (KDD03)*, 2003, pp. 197–205.

Hierarchical model-based clustering of large datasets through fractionation and refractionation (with J. M. Tantrum and A. Murua). *Information Systems*, Vol. 29, No. 4, 2004, pp. 315–326.

PET measures of pre- and post-synaptic cardiac beta adrenergic function (with J.R. Link, J.R. Stratton, W. Levy, J.E. Poole, S.C. Shoner, and J.H. Caldwell). *Nuclear Medicine and Biology*, Vol. 30, 2003, pp. 795–803.

Projective surface matching of colored 3d scans (with K. Pulli, S. Piironen, and T. Duchamp). *Proceedings of the Fifth International Conference on 3D Digital Imaging and Modeling*, 2005, pp. 531–538.

Observations on bagging (with A. Buja). *Statistica Sinica*, Vol. 16, No. 2, 2006, pp. 323–352.

Model based document classification and clustering (with A. Murua, J. Tantrum, and S. Sieberts). *International Journal of Tomography & Statistics*, to appear.

Unrefereed Invited Publications

Some comments on the asymptotic behaviour of robust smoothers (with Yashaswini Mittal). In *Smoothing Techniques for Curve Estimation*, Springer Lecture Notes in Mathematics 757, Th. Gasser and M. Rosenblatt, eds, 1979.

Projection pursuit methods for data analysis (with J.H. Friedman). In *Modern Data Analysis*, Academic Press, R. Launer and A. Siegel, eds, 1982.

An introduction to real time graphical techniques for analyzing multivariate data (with J.H. Friedman and John McDonald). In: Proceedings of the Third Annual Conference and Exhibition of the National Computer Graphics Association, 1982, pp. 421 – 427.

Graphical exploration of multivariate data on the computer. *Allgemeines Statistisches Archiv*, Vol 68, 1984, pp. 63 – 80 (in German).

Discussion of Peter Huber's *Projection Pursuit* (with Andreas Buja). *Annals of Statistics*, Vol. 13, 1985, pp. 484 – 490.

Graphics, human interfaces, and programming paradigms for data analysis (with Andreas Buja). Conference Report, SIAM NEWS, 1986.

Design and implementation of Plot Windows. In: Proceedings of the Statistical Computing Sections of the American Statistical Association, 1987, pp 32 – 40.

Discussion of OMEGA - *online multivariate exploratory graphical analysis: routine search for structure* by C. Weihs and H. Schmidli. *Statistical Science*, 1990, pp. 217 – 218.

Odds plots: examining associations between views of a data set. In: *Computing and Graphics in Statistics*. Series IMA, Vol. 36, Springer Verlag, 1991.

Fitting surfaces to scattered data (with T.DeRose, T. Duchamp, H. Hoppe, and J.A. McDonald). In proceedings of *Curves and Surfaces in Computer Vision and Graphics 3* (SPIE proceedings Vol. 1830), pp 212 – 220.

Visualizing speech data and Hidden Markov models (with A. Buja and J. Schimert). In proceedings of *SoftStat '93*, Frank Faulbaum (Ed.), Fischer Verlag, 1994, pp 317–324.

Geometric properties of principal curves in the plane (with T. Duchamp). In *Robust Statistics, Data Analysis, and Computer Intensive Methods*, Helmut Rieder, ed, Springer Lecture Notes in Statistics #109, 1995.

Cross-validation. *Encyclopedia of Statistics in Behavioral Science*. Brian Everitt and David Howell, eds. Wiley, 2005.

Projection pursuit. Encyclopedia of Statistics in Behavioral Science. Brian Everitt and David Howell, eds. Wiley, 2005.

Technical Reports

PRIMS-ETH: *A program for interactive graphical data analysis* (with M. Thoma). Research Report No. 19, Fachgruppe für Statistik, ETH Zurich, 1978.

The In-Out method for linear regression with censored data (with J.H. Friedman). Technical Report No. 65, Division of Biostatistics, Stanford University, 1981.

Smoothing of scatterplots (with J.H. Friedman). Technical Report ORION 003, Department of Statistics, Stanford University, 1982.

Hardware for kinematic statistical graphics (with J.H. Friedman). Technical Report ORION 005, Department of Statistics, Stanford University, 1981.

Project ORION final report (with Jerome H. Friedman and Gene H. Golub). Technical Report ORION 026, Department of Statistics, Stanford University, 1984.

Additive principal components (with Andreas Buja, Deborah Donnell). Technical Report No. 76, Department of Statistics, University of Washington, 1986.

Jeepers: an interface perception research tool (with S. Weghorst). Technical Report No. 185, Department of Statistics, University of Washington, 1989.

Viewing high dimensional data by painting multiple views (with J.A. McDonald, A. Buja). Technical Report No. 174, Department of Statistics, University of Washington, 1989.

Reconstructing two-dimensional manifolds from scattered data: motivation and background (with Tony DeRose, Tom Duchamp, Hugues Hoppe, and John McDonald). Technical Report No. 215, Department of Statistics, University of Washington, 1991.

The geometry of principal curves in the plane (with T. Duchamp). Technical Report No. 250, Department of Statistics, University of Washington, 1993 (submitted to *Annals of Statistics*).

Mesh optimization (with H.Hoppe, T. DeRose, T. Duchamp, and J.A. McDonald). Technical Report, Department of Computer Science, 1993. (This report contains results and proofs that did not make it into the SIGGRAPH paper due to space limitations).

Films and Video tapes

Exploring data with the ORION-1 workstation (with J.H. Friedman and John McDonald). Sound film, 25 minutes; Bin-88 Productions, Stanford Linear Accelerator Center, 1982.

Projection pursuit regression (with J.H. Friedman and John McDonald). Sound film, 25 minutes; Bin-88 Productions, Stanford Linear Accelerator Center, 1982.

Plot Windows. Video tape, 25 minutes; Department of Statistics, University of Washington, 1987.

Odds Plots: examining associations between views of a data set. Video tape, 20 minutes; Department of Statistics, University of Washington, 1988.

Analysis of fish abundance in the Bering Sea: a case study in the use of graphical methods. Video tape, 15 minutes; Department of Statistics, University of Washington, 1989.

Visualization of quantitative data (with A. Buja, J.A. McDonald, John Michalak, Steve Willis). Video tape, 27 minutes; Department of Statistics, University of Washington, 1990.

Visualizing Speech Signals and Hidden Markov Models (with A. Buja and J. Schimert). Video tape, 17 minutes; Bellcore, 1993.