

# Curriculum Vitae of Werner Stuetzle

## Address

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## Education

Diploma (M.S.), Mathematics, ETH Zürich 1973  
Ph.D., Mathematics, ETH Zürich 1977  
Thesis title: Estimation and Parametrization of Growth Curves  
Adviser: P.J. Huber

## Employment

Divisional Dean of Natural Sciences, University of Washington 2006–  
Chair, Department of Statistics, University of Washington 1994–2002  
Associate Professor and Professor, Department of Statistics, University of Washington, with an adjunct appointment in Computer Science and Engineering 1984–  
Research Staff Member, IBM Zurich Research Laboratory 1983–1984  
Visiting Professor, Department of Applied Mathematics and Center for Computational Research in Economics and Management Science, MIT 1981–1982  
Assistant Professor, Department of Statistics, Stanford University, with a joint appointment with the Computation Research Group of the Stanford Linear Accelerator Center 1978–1983

## Grant and Contract Awards

*Change point detection in multivariate data streams* (with D. Percival). 2005–2009  
Funded by the Office of Naval Research.  
Total amount: \$319,000.

<i>Nonparametric Cluster Analysis.</i>	2005–2009
Funded by the National Science Foundation.	
Total amount: \$169,000.	
<i>3d Scanning: Acquiring and Modeling Surface Properties</i> (with B. Curless and T. Duchamp).	1998–2001
Funded by the National Science Foundation.	
Total amount: \$406,000.	
<i>Improved Calibration Methods.</i>	1995–1997
Funded by the Center for Process Analytical Chemistry, University of Washington.	
Total amount: \$40,000.	
<i>3d Scanning: from Physical Objects to Electronic Models</i> (with T. DeRose, T. Duchamp, J.A. McDonald).	1994–1997
Funded by the National Science Foundation.	
Total amount: \$290,000.	
<i>Data Visualization Using Focusing and Linking</i> (with J.A. McDonald).	1992–1994
Funded by the National Science Foundation.	
Total amount: \$118,000.	
<i>Curve and Surface Reconstruction from Unorganized Data</i> (with T. DeRose, J.A. McDonald).	1991–1994
Funded by the National Science Foundation.	
Total amount: \$350,000.	
<i>Fish School Acoustics</i> (with G. Swartzman).	1991–1993
Funded by the Office of Naval Research.	
Total amount: \$198,000.	
<i>Nonparametric Methods in Multivariate Analysis</i> (with F. O’Sullivan, J.A. McDonald).	1988–1991
Funded by the Department of Energy.	
Total amount: \$721,312.	
<i>Nonparametric Methods in Multivariate Analysis</i> (with A. Buja, J.A. McDonald).	1985–1988
Funded by the Department of Energy.	
Total amount: \$767,799.	
<i>Nonparametric Methods in Multivariate Analysis</i> (with A. Buja).	1985–1988
Funded by the National Science Foundation.	
Total amount: \$106,427.	

*Projection Pursuit Methods for Graphical Data Analysis* (with J.H. Friedman). 1981–1984  
 Funded by the Department of Energy, the Office of Naval Research, and the Army Research Office.  
 Total amount:  $\approx$  \$100,000.

### **Service to the Profession**

Member, program committee, SIAM International Conference on Data Mining 2005  
 Associate Editor, *Statistics and Computing* 2004–2006  
 Member, program committee, KDD 2002–2005  
 Participant and plenary speaker, NSF sponsored workshop on “Statistics: Challenges and Opportunities for the 21st Century” 2002  
 Organizer, IMA workshop on “3D Scanning: From Physical Objects to Computer Models” 1996  
 Member, Visualization 'xx program committee 1988–2000  
 Chair, Statistical Graphics Section, American Statistical Association 1992  
 Program Chair, Statistical Graphics Section, American Statistical Association 1990  
 Member, ad hoc committee for a Journal of Computational and Graphical Statistics 1987  
 Participant in the Workshop on the Use of Computers in Statistical Research 1986  
 Organizer, AMS–IMS–SIAM Summer Research Conference on Large Scale Data Analysis via Computer Graphics (with A. Buja) 1986  
 Associate Editor, Special Section on Graphics, Journal of the American Statistical Association 1986  
 Associate Editor, Journal of the American Statistical Association 1983–1986  
 Organizer, Stanford Workshop on Advanced Statistical Graphics 1982

### **Service to the University of Washington**

Chair, Chair Search Committee, Department of Astronomy 2006  
 Director, Applied and Computational Mathematical Sciences program 2005–2007

Chair, faculty committee conducting 10-year review of the Department of Mathematics	2004
Chair, faculty committee conducting 10-year review of the Department of Electrical Engineering	2002
Chair, Chair Search Committee, Department of Computer Science and Engineering	2001
Chair, faculty committee conducting five year performance review of the Chair of Computer Science and Engineering	1998
Member, steering committee for new inter-departmental major in Applied and Computational Mathematical Sciences	1996–1999
Member of the Academic Senate	1987–1988
Member of the oversight committee for the Math Sciences Computing Center	1987–1990

### 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

### Ph.D. Students

John McDonald (1982), Trevor Hastie (1984), Deborah Donnell (1987), John Michalak (1990), Chisheng Huang (1992), Steve McKinney (1995), Sylvain Sardy (1998), Jeremy Tantrum (2003), Rebecca Nugent (2006), Ahrim Youn (2008).

### Invited Presentations at Conferences (since 1999)

Workshop on Innovation and Inventiveness in Statistics Methodologies, in honor of John Hartigan, Yale , May 14–17, 2009. *John Hartigan's work on clustering.*

Isaac Newton Institute Workshop on Contemporary Frontiers in High-Dimensional Statistical Data Analysis, Cambridge, January 7–11, 2008. *Nonparametric cluster analysis: estimating the cluster tree of a density.*

University of Chicago Toyota Technology Institute Workshop on Geometric and Topological Approaches to Data Analysis, October 8–12, 2007. *Estimating the cluster tree of a density.*

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

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*.

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).

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

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

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

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

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

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

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

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

## Refereed Publications

A. Kato, M.L. Moskal, P.Schiess, M.E. Swanson, D. Calhoun, and W. Stuetzle. *Capturing tree crown formation through implicit surface reconstruction using airborne lidar data*. Remote Sensing of the Environment, Vol. 113, Issue 6, 2009, pp. 1148–1162.

A. Kim, C. Marzban, D.B. Percival, and W. Stuetzle. *Using Labeled Data to Evaluate Change Detectors in a Multivariate Streaming Environment*. Signal Processing, 2009 (in press).

W. Stuetzle and R. Nugent. *A generalized single linkage algorithm for estimating the cluster tree of a density*. Journal of Computational and Graphical Statistics, 2009 (to appear).

A. Murua, L. Stanberry, and W. Stuetzle. *On Potts model clustering, kernel  $k$ -means, and density estimation*. Journal of Computational and Graphical Statistics, Vol. 17, No. 4, 2008, pp. 629–658.

- A. Murua, W. Stuetzle, J. Tantrum, and S. Sieberts. *Model based document classification and clustering*. International Journal of Tomography & Statistics, Vol. 8, No. W08, 2008, pp. 1–24.
- A. Buja and W. Stuetzle. *Observations on bagging*. Statistica Sinica, Vol. 16, No. 2, 2006, pp. 323–352.
- K. Pulli, S. Piironen, T. Duchamp, and W. Stuetzle. *Projective surface matching of colored 3d scans*. Proceedings of the Fifth International Conference on 3D Digital Imaging and Modeling, 2005, pp. 531–538.
- J.R. Link, J.R. Stratton, W. Levy, J.E. Poole, S.C. Shoner, W. Stuetzle, and J.H. Caldwell. *PET measures of pre- and post-synaptic cardiac beta adrenergic function*. Nuclear Medicine and Biology, Vol. 30, Issue 8, 2003, pp. 795–803.
- J.M. Tantrum, A. Murua, and W. Stuetzle. *Hierarchical model-based clustering of large datasets through fractionation and refractionation*. Information Systems, Vol. 29, No. 4, 2004, pp. 315–326.
- J.M. Tantrum, A. Murua, and W. Stuetzle. *Assessment and pruning of hierarchical model-based clustering*. Proceedings of the 9th International Conference on Knowledge Discovery and Data Mining (KDD03), 2003, pp. 197–205.
- D. Azuma, D. Wood, B. Curless, T. Duchamp, D. Salesin, and W. Stuetzle. *View-dependent refinement of multiresolution meshes with subdivision connectivity*. Proceedings of the 2nd International Conference on Computer Graphics, Virtual Reality, Visualisation and Interaction in Africa, 2003, pp. 69–78.
- W. Stuetzle. *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.
- T. Duchamp and W. Stuetzle. *Spline smoothing on surfaces*. Journal of Computational and Graphical Statistics, Vol. 12, No. 3, 2003, pp. 354–381.
- J.H. Friedman and W. Stuetzle. *John Tukey's work on interactive graphics*. Annals of Statistics, Vol. 30, No. 6, 2002, pp. 1629–1639.
- T. Kanungo, R.M. Haralick, H.S. Baird, W. Stuetzle, and D. Madigan. *A statistical, nonparametric methodology for document degradation model validation*. IEEE PAMI, Vol. 22, No. 11, 2000, pp. 1209–1223.
- D.N. Wood, D.L. Azuma, K. Aldinger, B. Curless, T. Duchamp, D.H. Salesin, and W. Stuetzle. *Surface light fields for 3D photography*. Computer Graphics, Vol. 34, 2000 (SIGGRAPH '2000 Proceedings), pp. 287–296.
- A. Certain and W. Stuetzle. *Automatic body measurement for mass customization of garments*. Proceedings of the Second International Conference on 3-D Digital Imaging and Modeling, 1999, pp. 405–412.
- A. Bruce, H.Y. Gao, and W. Stuetzle. *Wavelet denoising: a comparison of subset-selection and ensemble methods*. Statistica Sinica, Vol. 9, No. 1, 1999, pp. 167–182.

- S. Sardy, D.B. Percival, A.G. Bruce, H.Y. Gao, and W. Stuetzle. *Wavelet shrinkage for unequally spaced data*. *Statistics and Computing* 9, 1999, pp. 65–75.
- K. Pulli, H. Abi-Rached, T. Duchamp, L. Shapiro, and W. Stuetzle. *Acquisition and visualization of colored 3D objects*. *Proceedings of The 14th International Conference on Pattern Recognition*, Brisbane, Australia, August 1998, pp. 11–15.
- C. Huang, J.A. McDonald, and W. Stuetzle. *Variable-resolution bivariate plots*. *Journal of Computational and Graphical Statistics*, Vol. 6, No. 4, 1997, pp 383–396.
- K. Pulli, M. Cohen, T. Duchamp, H. Hoppe, L. Shapiro, and W. Stuetzle. *View-based rendering: visualizing real objects from scanned range and color data*. *Proceedings of the 8th Eurographics Workshop on Rendering*, June 1997, pp. 23–34.
- K. Pulli, M. Cohen, T. Duchamp, H. Hoppe, J. McDonald, L. Shapiro, and W. Stuetzle. *Surface modeling and display from range and color data*. *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.
- K. Pulli, T. Duchamp, H. Hoppe, J.A. McDonald, L. Shapiro, and W. Stuetzle. *Robust meshes from multiple range maps*. *Proceedings of the International Conference on Recent Advances in 3-D Digital Imaging and Modeling*, Ottawa, May 12-15, 1997, pp. 205–211.
- Andrew Certain, Jovan Popovic, Tony DeRose, Tom Duchamp, and W. Stuetzle. *Interactive multiresolution surface viewing*. *Computer Graphics*, Vol. 30, 1996 (SIGGRAPH '96 Proceedings), pp. 91–98.
- T. Duchamp and W. Stuetzle. *Extremal properties of principal curves in the plane*. *Annals of Statistics*, Vol. 24, No. 4, 1996, pp. 1511–1520.
- M. Eck, T. DeRose, T. Duchamp, H. Hoppe, M. Lounsbery, and W. Stuetzle. *Multiresolution analysis of arbitrary meshes*. *Computer Graphics*, Vol. 29, 1995 (SIGGRAPH '95 Proceedings), pp. 173–182.
- G. Swartzman, W. Stuetzle, K. Kulman and M. Powojowski. *Relating the distribution of pollock schools in the Bering Sea to environmental factors*. *ICES Journal of Marine Science*, Vol. 51, No. 4, 1994, pp. 481–492.
- G. Swartzman, K. Kulman, N. Wen, and W. Stuetzle. *Modeling the distribution of fish schools in the Bering Sea: morphological school identification*. *Natural Resource Modeling*, Vol. 8, No. 2, 1994, pp. 177–194.
- A. Buja, D. Donnell, and W. Stuetzle. *Analysis of additive dependencies and concavities using smallest additive principal components*. *Discussion paper*, *Annals of Statistics*, Vol. 22, 1994, pp. 1635–1673.
- H. Hoppe, T. DeRose, T. Duchamp, M. Halstead, H. Jin, J.A. McDonald, J. Schweitzer, and W. Stuetzle. *Piecewise smooth surface reconstruction*. *Computer Graphics*, Vol.

- 28, 1994, (SIGGRAPH '94 Proceedings), pp. 295–302.
- H. Hoppe, T. DeRose, T. Duchamp, J.A. McDonald, and W. Stuetzle. *Mesh optimization*. Computer Graphics, Vol. 27, 1993, (SIGGRAPH '93 Proceedings), pp. 19–26.
- H. Hoppe, T. DeRose, T. Duchamp, J.A. McDonald, and W. Stuetzle. *Surface reconstruction from unorganized points*. Computer Graphics, Vol. 26, 1992, (SIGGRAPH '92 Proceedings), pp. 71–78.
- A. Buja, J.A. McDonald, J. Michalak, S. Willis, and W. Stuetzle. *Visualization of complex data* (with 17 minute video tape). Video Proceedings of Visualization '91, San Diego, CA, Oct 21–25, 1991.
- A. Buja, J.A. McDonald, J. Michalak, and W. Stuetzle. *Interactive data visualization using focusing and linking*. Proceedings of Visualization '91, San Diego, CA, Oct 21–25, 1991, pp. 156–163.
- J.A. McDonald, A. Buja, and W. Stuetzle. *Painting multiple views of complex objects*. SIGPLAN Notices, Vol. 10, 1990, pp. 245–257.
- T. Hastie and W. Stuetzle. *Principal curves*. Journal of the American Statistical Association, Vol. 84, 1989, pp. 502–516.
- W. Stuetzle. *Plot windows*. Journal of the American Statistical Association, Vol. 82, 1987, pp. 466–475.
- J.H. Friedman, W. Stuetzle, and A. Schroeder. *Projection pursuit density estimation*. Journal of the American Statistical Association, Vol 79, 1984, pp. 599–608.
- J.H. Friedman, E.H. Grosse, and W. Stuetzle. *Multidimensional additive spline approximation*. SIAM Journal on Scientific and Statistical Computing, Vol 4, 1983, pp. 291–301.
- J.H. Friedman and W. Stuetzle. *Projection pursuit regression*. Journal of the American Statistical Association, Vol 76, 1981, pp. 817–823.
- W. Stuetzle, T. Gasser, L. Molinari, R.H. Largo, A. Prader, and P.J. Huber. *Shape-invariant modelling of human growth*. Annals of Human Biology, Vol. 7, No. 6, 1980, pp. 507–528.
- R. Largo, T. Gasser, A. Prader, W. Stuetzle, and P.J. Huber. *Analysis of the adolescent growth spurt using smoothing spline functions*. Annals of Human Biology, Vol. 5, No. 5, 1978, pp. 421–434.
- R. Largo and W. Stuetzle. *Longitudinal study of bowel and bladder control by day and at night during the first six years of life I: Epidemiology and interrelations between bowel and bladder control*. Developmental Medicine and Child Neurology, Vol. 19, No. 5, 1977, pp. 598–606.
- R. Largo and W. Stuetzle. *Longitudinal study of bowel and bladder control by day and at night during the first six years of life II: The role of potty training and the child's*

*initiative*. *Developmental Medicine and Child Neurology*, Vol. 19, No. 5, 1977, pp. 607–613.

### Unrefereed Invited Publications

A. Buja and W. Stuetzle. Discussion of *Evidence Contrary to the Statistical View of Boosting* by D. Mease and A. Wyner. *Journal of Machine Learning Research*, Vol. 9, 2008, pp. 165–170.

W. Stuetzle. *Projection pursuit*. *Encyclopedia of Statistics in Behavioral Science*. Brian Everitt and David Howell, eds, Wiley, 2005, Vol. 3, pp. 1614–1617.

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

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

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

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

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

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

A. Buja and W. Stuetzle. Discussion of Peter Huber's *Projection Pursuit*. *Annals of Statistics*, Vol. 13, 1985, pp. 484–490.

W. Stuetzle. *Graphical exploration of multivariate data on the computer*. *Allgemeines Statistisches Archiv*, Vol 68, 1984, pp. 63–80.

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

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

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

### **Selected Technical Reports**

T. DeRose, T. Duchamp, H. Hoppe, J.A. McDonald, and W. Stuetzle. *Reconstructing two-dimensional manifolds from scattered data: motivation and background*. Technical Report No. 215, Department of Statistics, University of Washington, 1991.

S. Weghorst and W. Stuetzle. *Jeepers: an interface perception research tool*. Technical Report No. 185, Department of Statistics, University of Washington, 1989.

J.H. Friedman, Gene H. Golub, and W. Stuetzle. *Project ORION final report*. Technical Report ORION 026, Department of Statistics, Stanford University, 1984.

J. H. Friedman and W. Stuetzle. *Smoothing of scatterplots*. Technical Report ORION 003, Department of Statistics, Stanford University, 1982.

J.H. Friedman and W. Stuetzle. *Hardware for kinematic statistical graphics*. Technical Report ORION 005, Department of Statistics, Stanford University, 1981.

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

### **Films and Video tapes**

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

A. Buja, J.A. McDonald, J. Michalak, S. Willis, and W. Stuetzle. *Visualization of quantitative data*. Video tape, 27 minutes; Department of Statistics, University of Washington, 1990.

Werner Stuetzle. *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.

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

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

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

J.H. Friedman, J.A. McDonald, and W. Stuetzle. *Projection pursuit regression*. Sound film, 25 minutes; Bin-88 Productions, Stanford Linear Accelerator Center, 1982.