

## SOME THEMES IN NONPARAMETRIC STATISTICS 1975-2000

Ronald H. Randles  
University of Florida

### REFERENCES

#### EXPLORING DATA

- Tukey, J.W. (1977) *Exploratory Data Analysis*, Addison-Wesley, Reading.  
Hoaglin, D.C., Mosteller, F. and Tukey, J.W. (1983) *Understanding Robust and Exploratory Data Analysis*, Wiley, New York.  
Hoaglin, D.C., Mosteller, F. and Tukey, J.W. (1991) *Fundamentals of Exploratory Analysis of Variance*, Wiley, New York.

#### ROBUSTNESS

- Hampel, F.R. (1968) "Contributions to the Theory of Robustness", PhD thesis, Berkeley.  
Hampel, F.R. (1974) "The Influence Curve and Its Role in Robust Estimation", *J. American Statistical Association*, **69**, 383-393.  
Hampel, F.R. (1971) "A General Qualitative Definition of Robustness", *Annals of Mathematical Statistics*, **42**, 1887-1896.  
Serfling, R.J. (1980) *Approximation Theorems of Mathematical Statistics* Wiley, New York.  
Hampel, F.R., Ronchetti, E.M., Rousseeuw, P.J. and Stahel, W.A. (1986) *Robust Statistics: The Approach Based on Influence Functions*, Wiley, New York.  
Sen, P.K. and Singer, J.M. (1993) *Large Sample Methods in Statistics*, Chapman & Hall, New York.  
Lehmann, E.L. (1999) *Elements of Large Sample Theory*, Springer-Verlag, New York.  
Hogg, R.V. (1974) "Adaptive Robust Procedures: A Partial Review and Some Suggestions for Future Applications and Theory", *J. American Statistical Association*, **69**, 909-927.  
Hogg, R.V. (1976) "A New Dimension to Nonparametric Tests", *Comm. Statist.*, **5**, 1313-1325.  
Donoho, D.L. and Huber, P.J. (1983) "The notion of Breakdown Point", *Festschrift for Erich Lehmann*, Bickel, Doksum and Hodges Editors, Wadsworth, Belmont.  
Huber, P.J. (1981) *Robust Statistics*, Wiley, New York.  
Rousseeuw, P.J. (1985) "Multivariate Estimation with High Breakdown Point" in *Mathematical Statistics and applications* Vol B, Grossmann, et al Editors, Reidel, Dordrecht.  
Portnoy, S. and He, X. (2000) "A Robust Journey in the New Millennium", *J. American Statistical Association*, **95**, 1331-1335.

#### BOOTSTRAP

- Efron, B. (1979) "Bootstrap Methods: Another Look at the Jackknife", *Ann. Statist.*, **7**, 1-26.  
Efron, B. (1987) "Better Bootstrap Confidence Intervals", *J. Amer. Statist. Assoc.*, **82**, 171-200.  
Singh, K. (1981) "On the Asymptotic Accuracy of Efron's Bootstrap", *Ann. Statist.*, **9**, 1187-1195.  
Hall, P. (1988) "Rates of Convergence in Bootstrap Approximations", *Ann. Prob.*, **16**, 1165-1185.  
Sheather, S.J. (1987) "Assessing the Accuracy of the Sample Median", *Statistical Analysis*

- Based on the L1 Norm*, Ed. Y. Dodge, 203-215, North Holland, Amsterdam.
- Hall, P. and Martin, M.A. (1988) "On Bootstrap Resampling and Iteration", *Biometrika*, **75**, 661-671.
- Hutson, A.D. and Ernst, M.D. (2000) "The Exact Bootstrap Mean and Variance of an L-Estimator", *J. Royal Statistical Society, B*, **62**, 89-94.
- Efron, B. (1990) "More Efficient Bootstrap Computations", *J. Amer. Statist. Assoc.*, **85**, 79-89.
- Efron, B. and Gong, G. (1983) "A Leisurely Look at the Bootstrap, the Jackknife and Cross-Validation", *American Statistician*, **37**, 36-48.
- Romano, J.P. (1988), "A Bootstrap Revival of Some Nonparametric Distance Tests", *J. American Statistical Association*, **83**, 698-708.
- Hall, P. (1992) *The Bootstrap and Edgeworth Expansion*, Springer, New York.
- Efron, B. and Tibshirani, R.J. (1993) *An Introduction to the Bootstrap*, Chapman Hall.
- Shao, J. and Tu, D. (1995) *The Jackknife and Bootstrap*, Springer, New York.
- Davison, A. and Hinkley, D. (1997) *Bootstrap Methods and their Application*, Cambridge University Press, London.
- Presnell, B. and Hall, P. (1999) "Intensionally Biased Bootstrap Methods", *J. Royal Statistical Society, B*, **61**, 143-158.
- Efron, B. (2000) "The Bootstrap and Modern Statistics", *J. Amer. Statist. Assoc.*, **95**, 1293-1296.
- SMOOTHING**
- Nadaraya, E.A. (1964) "On Estimating Regression", *Th. Prob. and Appl.*, **9**, 141-142.
- Watson, G.A. (1964), "Smooth Regression Analysis", *Sankhya A*, **26**, 359-372.
- Härdle, W., Hall, P. and Marron, J.S. (1992) "Regression Smoothing Parameters that are not far from their Optimum", *J. American Statistical Association*, **87**, 227-233.
- Cleveland, W. (1979) "Robust Locally Weighted Regression Estimator", *J. American Statistical Association*, **74**, 829-836.
- Tibshirani, R. and Hastie, T. (1987) "Local Likelihood Estimation", *J. American Statistical Association*, **82**, 559-568.
- Fan, J. and Gijbels, I. (1996) *Local Polynomial Modelling and Its Applications*, Chapman Hall, London.
- Whaba, G. and Wold, S. (1975) "A Completely Automatic French Curve: Fitting Spline Functions by Cross Validation", *Communications in Statistics*, **4**, 1-7.
- Eubank, R. (1999) *Smoothing Splines and Nonparametric Regression*, 2nd Ed., Marcel Dekker.
- Simonoff, J.S. (1996) *Smoothing Methods in Statistics*, Springer - Verlag, New York.
- Hart, J.D. (1997) *Nonparametric Smoothing and Lack-of-Fit Tests*, Springer - Verlag.
- Fix, E. and Hodges, J.L. (1951), "Discriminant Analysis - Nonparametric Discrimination: Consistency Properties", Report No. 4, Project No.21-29-004, USAF School of Aviation Medicine, Randolph Field Texas.
- Rosenblatt, M. (1956) "Remarks on some nonparametric estimates of a density function" *Ann. Math. Statist.*, **27**, 832-837.
- Parzen, E. (1962), "On Estimation of a probability density function and mode", *J. Amer. Statist. Assoc.*, **33**, 1065-1076.
- Silverman, B.W. (1986) *Density Estimation for Statistics and Data Analysis*, Chapman

Hall, London.

Härdle, W. (1989) *Applied Nonparametric Regression*, Cambridge University Press, London.

Scott, D.W. (1992) *Multivariate Density Estimation: Theory Practice and Visualization*, Wiley, New York.

Schucany, W.R. (1989) “Locally Optimal Window widths of Kernel Density Estimation with Large Samples”, *Statistics and Probability Letters*, **7**, 401-405.

Hall, P. (1990) “On the Bias of Variable Bandwidth Curve Estimators”, *Biometrika*, **77**, 529-536.

## QUANTILES

Parzen, E. (1979) “Nonparametric Statistical Data Modeling” *J. Amer. Statist. Assoc.*, **74**, 105-120.

Csörgö, M. (1983) *Quantile Processes with Statistical Applications*, SIAM, Philadelphia.

Babu, G.J. and Rao, C.R. (1988) “Joint Asymptotic Distribution of Marginal Quantiles and Quantile Functions in Samples from a Multivariate Population”, *J. of Multivariate Analysis*, **27**, 15-23.

Padgett, W.J. (1986) “A Kernel Type Estimator of a Quantile Function for Right Censored Data”, *J. American Statistical Association*, **81**, 215-222.

Sheather, S.J. and Marron, J.S. (1990) “Kernel Quantile Estimators”, *J. American Statistical Association*, **85**, 410-416.

Mudholkar, G.S. and Hutson, A.D. (1997) “Improvements in the Bias and Precision of the Sample Quartiles”, *Statistics*, **30**, 239-257.

## RANK METHODS FOR LINEAR MODELS

Jureckova, J. (1971) “Nonparametric Estimate of Regression Coefficients”, *Annals of Mathematical Statistics*, **42**, 1328-1338.

Puri, M.L. and Sen, P.K. (1985) *Nonparametric Methods in General Linear Models*, Wiley, New York.

Jaekel, L.A. (1972) “Estimating Regression Coefficients by Minimizing the Dispersion of Residuals”, *Annals of Mathematical Statistics*, **43**, 1449-1458.

Hettmansperger, T.P. and McKean, J.W. (1983) “A Geometric Interpretation of Inferences Based on Ranks in the Linear Model”, **78**, 885-893.

Sievers, G.L. (1983) “A Weighted Dispersion Function for Estimation in Linear Models”, *Communications in Statistics, Theory and Methods*, **12(10)**, 1161-1179.

Naranjo, J.D. and Hettmansperger, T.P. (1994) “Bounded-Influence Rank Regression”, *J. Royal Statistical Society, B*, **56**, 209-220.

Simpson, D.G., Rupert, D. and Carroll, R.J. (1992) “On One-Step GM-Estimates and Stability of Inferences in Regression”, *J. American Statistical Association*, **87**, 439-450.

Chang, W.H., McKean, J.W., Naranjo, J.D. and Sheather, S.J. (1999) “High Breakdown Rank Regression”, *J. American Statistical Association*, **94**, 205-219.

Hettmansperger, T.P., McKean, J.W. and Sheather, S.J. (2000) “Robust Nonparametric Methods”, *J. American Statistical Association*, **95**, 1308-1312.

McKean, J.W., Sheather, S.J. and Hettmansperger, T.P. (1990) “Regression Diagnostics for Rank-Based Methods”, *J. Amer. Statist. Assoc.*, **85**, 1018-1028.

McKean, J.W., Sheather, S.J. and Hettmansperger, T.P. (1993) “The Use and Interpretation of Residuals Based on Robust Estimation”, *J. Amer. Statist. Assoc.*, **88**, 1254-1263.

## MULTIVARIATE METHODS

- Puri, M.L. and Sen, P.K. (1971) "Nonparametric Methods in Multivariate Analysis", Wiley, New York.
- Wegman, (1986) "Representing Multivariate Meteorological Data using Parallel Coordinates", Proceedings of the Tenth Conference on Weather Modification, 121-123.
- Brown, B.M. (1983) "Statistical Uses of the Spatial Median", *J. Roy. Statist. Soc.*, B45, 25-30.
- Lopuhaa, H.P. and Rousseeuw, P.J. (1991) "Breakdown Points of Affine Equivariant Estimators of Multivariate Location and Covariance Matrices", *Annals of Statistics*, 19, 229-248.
- Oja, H. (1983) "Descriptive Statistics for Multivariate Distributions", *Statistics and Probability Letters*, 1, 327-332.
- Brown, B.M. and Hettmansperger, T.P. (1989) "An Affine Invariant Bivariate Version of the Sign Test", *Journal of the Royal Statistical Society*, B, 51, 117-125.
- Hettmansperger, T.P., Nyblom, J. and Oja, H. (1994) "Affine Invariant Multivariate One-Sample Sign Tests", *J. Royal Statistical Society*, B, 56, 221-234.
- Hettmansperger, T.P., Mottonen, J., and Oja, H. (1997) "Affine Invariant Multivariate One-Sample Signed-Rank Test", *J. of the American Statistical Association*, 92, 1591-1600.
- Liu, R.Y. (1990) "On a Notion of Data Depth Based upon Random Simplices", *Annals of Statistics*, 18, 405-414.
- Zuo, Y. and Serfling, R.J. (2000) "General Notions of Statistical Depth Function", *Annals of Statistics*, 28, 461-482.
- Zuo, Y. and Serfling, R.J. (2000), "On the Performance of Some Robust Nonparametric Location Measures Relative to a General Notion of Multivariate Symmetry", *J. of Statistical Planning and Inference*, 84, 55-79.
- Chakraborty, B., Chaudhuri, P. and Oja, H. (1998) "Operating Transformation Retransformation on Spatial Median and Angle Test", *Statistica Sinica*, 8, 767-784.
- Peters, D. and Randles, R.H. (1990), "A Multivariate Signed-Rank Test for the One-Sample Location Problem", *J. of the American Statistical Association*, 85, 552-557.
- Hossjer, O. and Croux, C. (1995) "Generalizing Univariate signed Rank Statistics for Testing and Estimating a Multivariate Location Parameter", *J. Nonpar. Statist.*, 4, 293-308.
- Randles, R.H. (2000) "A Simpler, Affine Invariant, Multivariate, Distribution-Free Sign Test", *J. Amer. Statist. Assoc.*, 95, 1263-1268.
- GENERAL TEXTS**
- Lehmann, E.L. (1975) "Nonparametrics: Statistical Methods Based on Ranks", Holden-Day, San Francisco.
- Conover, W.J. (1998) "Practical Nonparametric Statistics", 3rd Edition, Wiley, New York.
- Hollander, M. and Wolfe, D.A. (1999) "Nonparametric Statistical Methods", 2nd Edition, Wiley, New York.
- Sprent, P. and Smeeton, N.C. (2000) "Applied Nonparametric Statistical Methods, 3rd Edition, CRC Press, Boca Raton.
- Randles, R.H. and Wolfe, D.A. (1979) "Introduction to the Theory of Nonparametric Statistics", Wiley, New York.
- Hettmansperger, T.P. (1984) "Statistical Inference Based on Ranks", Wiley, New York.
- Hettmansperger, T.P. and McKean, J.W. (1998) "Robust Nonparametric Statistical Methods", Arnold, London.