

Bibliography

- Abry P (2003) Scaling and wavelets: an introductory walk. In: Rangarajan G, Ding M (eds) Processes with long-range correlations: theory and applications. Springer, Berlin
- Acton ST, Mukherjee DP (2000) Scale space classification using area morphology. *J IEEE Trans Image Process* 9(4):623–635
- Aha DW, Kibler D, Albert MK (1991) Instance-based learning algorithms. *Mach Learn* 6:37–66
- Ahlqvist O (2005) Using uncertain conceptual spaces to translate between land cover categories. *Int J Geogr Inform Sci* 19:831–857
- Ahlqvist O, Keukelaar J, Oukbir K (2000) Rough classification and accuracy assessment. *Int J Geogr Inform Sci* 14:475–496
- Ahlqvist O, Keukelaar J, Oukbir K (2003) Rough and fuzzy geographical data intergration. *Int J Geogr Inform Sci* 17:223–234
- Aldridge CH (1998) A theory of empirical spatial knowledge supporting rough set based knowledge discovery in geographical databases. Ph.D. thesis, University of Otago, Dunedin, New Zealand
- Allenby GM, Rossi PE (1994) Modeling household purchase behavior with logistic normal regression. *J Am Stat Assoc* 89:1218–1231
- Amari S (1995) Information geometry of the EM and EM algorithms for neural. *Neural Network* 8 (9):1379–1409
- Amorese D, Lagarde JL, Laville E (1999) A point pattern analysis of the distribution of earthquakes in Normandy (in France). *J Bull Seismol Soc Am* 89(3):742–749
- Anderberg MR (1973) Cluster analysis for applications. Academic, New York
- Anderson JA (1982) Logistic discrimination. In: Krishnaiah PR, Kanal L (eds) Hand book of statistics, vol 2. North-Holland, Amsterdam, pp 169–191
- Andreo B, Jiménez P, Durán JJ, Carrasco I, Vadillo I, Mangin A (2006) Climatic and hydrological variations during the last 117–166 years in the south of the Iberian Peninsula, for spectral and correlation analyses and continuous wavelet analyses. *J Hydrol* 324:24–39
- Angulo C, Catala A (2000) K_SVCR. A Multi-class support vector machine. In: Lopez de Mantaras R, Plaza E (eds) ECML 2000, LNAI 1810. Springer, Berlin, pp. 31–38
- Angulo JM, Ruiz-Medina MD, Anh VV, Grecksch W (2000) Fractional diffusion and fractional heat equation. *Appl Prob* 32:1077–1099
- Anh VV, Heyde CC (Eds) (1999c) Special issue on long-range dependence. *J Statist Plann Inf* 80:1-292
- Anh VV, Leonenko NN (2000) Scaling laws for the fractional diffusion-wave equation with random data. *Stat Prob Lett* 48:239–252
- Anh VV, Leonenko NN (2001) Spectral analysis of fractional kinetic equations with random data. *J Stat Phys* 104(516):1349–1387

- Anh VV, Duc H, Azzi M (1997a) Modelling anthropogenic trends in air quality data. *J Air Waste Manag Assoc* 47(1):66–71
- Anh VV, Duc H, Tieng Q (1997b) Modelling persistence and intermittency in air pollution. In: Power H, Tirabassi T, Brebbia CA (eds) *Air pollution V: modelling monitoring and management*. Computational Mechanics Publications, Southampton, pp 443–452
- Anh VV, Gras F, Tsui HT (1996) Multifractal description of natural scenes. *Fractals* 4(1):35–43
- Anh VV, Heyde CC, Tieng Q (1999a) Stochastic models for fractal processes. *J Stat Plann Infer* 80 (1/2):123–135
- Anh VV, Lam KC, Leung Y, Tieng Q (1999b) Multifractal analysis of Hong Kong air quality data. *Environmetrics* 10:139–149
- Anh VV, Leung Y, Chen D, Yu ZG (2005b) Spatial variability of daily rainfall using multifractal analysis (unpublished paper)
- Anh VV, Leung Y, Lam KC, Yu ZG (2005b) Multifractal characterization of Hong Kong air quality data. *Environmetrics* 16:1–12
- Ankerst M, Breuning M, Kriegel HP, Sander J (1999) OPTICS: ordering points to identify the clustering structure. In: *Proceedings of the 1999 ACM-SIGMOD international conference on management of data (SIGMOD'99)*, pp. 49–60
- Anselin L (1988) *Spatial econometrics: methods and models*. Kluwer, Dordrecht
- Anselin L (1990) Spatial dependence and spatial structural instability in applied regression analysis. *J Reg Sci* 30:185–207
- Anselin L (1995) Local indicators of spatial association – LISA. *Geogr Anal* 27:93–115
- Anselin L (1998a) Exploratory spatial data analysis in a geocomputational environment. In: Longley P, Brooks A, McDonnell SM, Macmillan B (eds) *Geocomputation: a primer*. Wiley, Chichester
- Anselin L (1998b) Exploratory spatial data analysis in a geocomputational environment. In: Longley P, Brooks A, McDonnell SM, Macmillan B (eds) *Geocomputation: a primer*. Wiley, Chichester
- Anselin L, Griffith DA (1988) Do spatial effects really matter in regression analysis? *Paper Reg Sci Assoc* 65:11–34
- Anselin L, Rey S (1991) Properties of tests for spatial dependence in linear regression models. *Geogr Anal* 23:112–131
- Arabie P, Hubert L, De Soete G (eds) (1996) *Clustering and classification*. World Scientific, Singapore
- Arbia G (1989) *Spatial data configuration in statistical analysis of regional economic and related problems*. Kluwer, Dordrecht
- Arbib MA (ed) (1995) *The handbook of Brain Theory and Neural Networks*. MIT, Cambridge
- Asano T, Katoh N (1996) Variants for the Hough transform for line detection. *Comput Geom* 6:231–252
- Atallah MJ (1992) Parallel techniques for computational geometry. *Proc IEEE* 80(9):1435–1448
- Atkinson PM, Curran PJ (1997) Choosing an appropriate spatial resolution for remote sensing investigations. *Photogramm Eng Rem Sens* 63(12):1345–1351
- Atkinson PM, Tatnall ARL (1997) Neural networks in remote sensing. *Int J Remote Sens* 18 (4):699–709
- Babaud J, Witkin AP, Baudin M, Duda R (1986) Uniqueness of the Gaussian kernel for scale-space filtering. *J IEEE Trans Pattern Anal Mach Intell* 8:26–33
- Bacry E, Muzy J, Arneodo A (1993) Singularity spectrum of fractal signals from wavelet analysis: exact results. *J Stat Phys* 70(314):635–647
- Ball G, Hall D (1976) A clustering technique for summarizing multivariate data. *J Behav Sci* 12:153–155
- Banfield JD, Raftery AE (1993) Model-based Gaussian and non-Gaussian clustering. *Biometrics* 49:803–821
- Bao S, Henry M (1996) Heterogeneity issues in local measurements of spatial association. *Geogr Syst* 3:1–13

- Barnett V, Lewis T (1994) *Outliers in statistical data*. Wiley, New York
- Basak J, Mahata D (2000) A connectionist model for corner detection in binary and gray images. *J IEEE Trans Neural Network* 11:1124–1132
- Benediktsson JA, Swain PH, Ersoy OK (1990) Neural network approaches versus statistical methods in classification of multi-source remote sensing data. *IEEE Trans Geosci Rem Sens* 28(4):540–552
- Beniston M, Stephenson DB (2004) Extreme climate events and their evolution under changing climatic conditions. *Global Planet Change* 44:1–9
- Bennett RJ (1979) *Spatial time series: analysis-forecasting-control*. Pion, London
- Bentley JL, Clarkson KL, Levine DB (1993) Fast Linear expected-time algorithms for computing maxima and convex hulls. *J Algorithmica* 9:168–183
- Beran J (1992) Statistical methods for data with long-range dependence. *Stat Sci* 7:404–416
- Beran J (1994) *Statistics for long-memory processes*. Chapman and Hall, New York
- Berkson J (1944) Application of the logistic function to bio-assay. *J Am Stat Assoc* 39:357–365
- Bern MW, Karloff HJ, Schieber B (1992) Fast Geometric approximation techniques and geometric embedding problems. *J Theor Comput Sci* 106:265–281
- Bezdek JC (1980) A convergence theorem for the fuzzy ISODATA clustering algorithms. *J IEEE Trans Pattern Anal Machine Intell* 2:1–8
- Bezdek JC, Coray C, Gunderson R, Watson J (1981) Detection and characterization of cluster substructure. I. linear structure: fuzzy C-line. *SIAM J Appl Math* 40(2):339–357
- Bezdek JC, Hathaway RJ, Windham MP (1991) Numerical comparison of the RFCM and AP algorithms for clustering relational data. *J Pattern Recogn* 24(8):783–791
- Bezdek JC, Keller JM, Krishnapuram R, Pal NR (1999) *Fuzzy models and algorithms for pattern recognition and image processing*. Kluwer, Boston
- Bhattacharya U, Parui SK (1997) An improved back-propagation neural network for detection of road-like features in satellite imagery. *Int J Rem Sens* 18(6):3379–3394
- Bischof H, Schneider W, Pinz AJ (1992) Multi-spectral classification of landsat images using neural network. *IEEE Trans Geosci Rem Sens* 30:482–490
- Bishop CM (1995a) *Neural networks for pattern recognition*. Clarendon Press, Oxford
- Bishop CM (1995b) *Radial basis functions, neural networks for pattern recognition*. Clarendon Press, Oxford
- Bittner T, Stell JG (2002) Vagueness and rough location. *Geoinformatica* 6:99–121
- Blatt M, Wiseman S, Domany E (1997) Data clustering using a model granular magnet. *J Neural Comput* 9:1805–1847
- Blum RS (2005) Robust image fusion using a statistical signal processing approach. *Inform Fusion* 6(2):119–128
- Bonsal BR, Zhang X, Vincent LA, Hogg WD (2001) Characteristic of daily and extreme temperatures over Canada. *J Clim* 14:1959–1976
- Boots B, Getis A (1988) *Point pattern analysis*. Sage Publications, London
- Boots B, Tiefelsdorf M (2000) Global and local spatial autocorrelation in bounded regular tessellations. *J Geogr Syst* 2:319–348
- Borgas MS (1992) A comparison of intermittency models in turbulence. *Phys Fluid A* 4(9):2055–2061
- Box GEP, Jenkins GM (1976) *Time series analysis: forecasting and control*. Holden-Day, San Francisco, CA
- Box GEP, Jenkins GM, Reinsel GC (1994) *Time series analysis: forecasting and control*. Prentice Hall, Englewood Cliffs, NJ
- Breiman L (2001) Random forests. *Mach Learn* 45:5–32
- Breiman L, Friedman JH, Olshen RA, Stone CJ (1984) *Classification and regression trees*. Wadsworth, California
- Brown M, Lewis HG, Gunn SR (1999) Support vector machines for spectral unmixing. *IGRASS'99* 2:1363–1365

- Brown M, Lewis HG, Gunn SR (2000) Linear spectral mixture models and support vector machines for remote sensing. *IEEE Trans Geosci Rem Sens* 38(5):2346–2360
- Brunsdon C, Fotheringham AS, Charlton M (1996) Geographically weighted regression: a method for exploring spatial nonstationarity. *Geogr Anal* 28:281–298
- Brunsdon C, Fotheringham AS, Charlton M (1997) Geographical instability in linear regression modeling – a preliminary investigation. In: *New techniques and technologies for statistics II: Proceedings of the Second Bonn Seminar IOS Press, Amsterdam*, pp. 149–158
- Brunsdon C, Fotheringham AS, Charlton M (1999) Some notes on parametric significance test for geographically weighted regression. *J Reg Sci* 39(3):497–584
- Brunsdon C (1995) Estimating probability surfaces for geographical point data: an adaptive kernel algorithm. *Comput Geosci* 21:877–894
- Bruzzzone L, Prieto DF (1999) A technique for the selection of kernel-function parameters in RBF neural networks for classification of remote-sensing images. *IEEE Trans Geosci Rem Sens* 37(2):551–559
- Bruzzzone L, Prieto DF (2000) Automatic analysis of the difference image for unsupervised change detection. *IEEE Trans Geosci Rem Sens* 38(3):1171–1182
- Bruzzzone L, Prieto DF (2001) Unsupervised retraining of a maximum likelihood classifier for the analysis of multitemporal remote sensing images. *IEEE Trans Geosci Rem Sens* 39(2):456–460
- Bruzzzone L, Prieto DF, Serpico SB (1999) A neural-statistical approach to multitrmporal and multisource remote-sensing image classification. *J IEEE Trans Geosci Rem Sens* 37:1350–1359
- Burges C, Scholkopf B (1997) Improving the accuracy and speed of support vector machines. In: *Mozer M, Jordan M, Petsche T (eds) Neural information processing systems*. MIT, Cambridge
- Burges CJC (1998) A tutorial on support vector machines for pattern recognition. *Data Min Knowl Discov* 2:121–167
- Burridge P (1980) On the cliff-ord test for spatial correlation. *J Roy Stat Soc B* 42:107–108
- Burrough PA (1986) *Principles of geographic information systems for land resources assessment*. Oxford University Press, Oxford
- Cao Z, Fu Z (1999) Clustering of long- and medium-term seismicity on China mainland (in Chinese with English abstract). *J Earthquake* 19(4):338–344
- Cao Z, Kandel A, Li L (1990) A new model of fuzzy reasoning. *Fuzzy Set Syst* 36:311–325
- Caron F, Duflos E, Pomorski D, Vanheeghe P (2006) GPS/IMU data fusion using multisensor Kalman filtering: introduction of contextual aspects. *Inform Fusion* 7(2):221–230
- Carpenter GA, Grossberg S (1987) ART2: self-organization of stable category recognition codes for analog input pattern. In: *Proceedings IEEE international conference neural networks*. San Diego, CA. pp. 727–736
- Carpenter GA, Grossberg S (1988) The ART of adaptive pattern recognition by a self-organizing neural network. *Computer* 21:77–88
- Carpenter GA, Grossberg S, Reynolds JH (1991) ARTMAP: supervised real time learning and classification of nonstationary data by a self-organising neural network. *Neural Networks* 4:565–588
- Carpenter GA, Grossberg S, Markuzon N, Reynolds JH, Rosen DB (1992) Fuzzy ARTMAP: a neural network architecture for incremental supervised learning of analog multi-dimensional maps. *IEEE Trans Neural Network* 3:698–713
- Casetti E (1972) Generating models by the expansion method: applications to geographical research. *J Geogr Anal* 4:81–91
- Casetti E (1982) Drift analysis of regression analysis: an application to the investigation of fertility development relations. *Modeling Simul* 13:961–966
- Casetti E (1986) The dual expansion method: an application for evaluating the effects of population growth on development. In: *IEEE transactions on systems, man and cybernetics SMC-16*, pp. 29–39

- Casetti E (1997) The expansion method, mathematical modelling, and spatial econometrics. *Int Reg Sci Rev* 20:9–32
- Caudill SB, Acharya RN (1998) Maximum likelihood estimation of a mixture of normal regressions: starting values and singularities. *Comm Stat Simulat* 27(3):667–674
- Celeux G, Govaert G (1992) A classification EM algorithm for clustering and two stochastic versions. *J Comput Stat Data Anal* 14:315–332
- Chakravarthy SV, Ghosh J (1996) Scale-based clustering using the radial basis function network. *J IEEE Trans Neural Network* 7(5):1250–1261
- Chen T, Chen H (1995) Approximation capability to functions of several variables, nonlinear functions, and operators by radial basis function neural networks. *IEEE Trans Neural Network* 6:904–910
- Chen Z, Ivanov PC, Hu K, Stanley HE (2002) Effect of nonstationarities on detrended fluctuation analysis. *Phys Rev E* 65(4):041107
- Cherkassky V, Mulier F (1997) *Learning from data: concepts, theory and methods*. Wiley, New York
- Chmielewski MR, Grzymala-Busse JW (1996) Global discretization of continuous attributes as preprocessing for machine learning. *Int J Approx Reason* 15:319–331
- Cihlar J (2000) Land cover mapping of large areas from satellites: status and research priorities. *Int J Remote Sens* 21(6):1093–1114
- Civco DL (1993) Artificial neural networks for land cover classification and mapping. *Int J Geogr Inform Syst* 7:173–186
- Cleveland WS (1979) Robust locally weighted regression and smoothing scatter-plots. *J Am Stat Assoc* 74:829–836
- Cleveland WS, Devlin SJ (1988) Locally weighted regression: an approach to regression analysis by local fitting. *J Am Stat Assoc* 83:596–610
- Cleveland WS, Devlin SJ, Grosse E (1988) Regression by local fitting: methods, properties and computational algorithms. *J Econom* 37:87–114
- Cliff AD, Ord JK (1972) Testing for spatial autocorrelation among regression residuals. *Geogr Anal* 4:267–284
- Cliff AD, Ord JK (1973) *Spatial autocorrelation*. Pion, London
- Collett D (1991) *Modelling binary data*. Chapman and Hall, London
- Cordy CB, Griffith DA (1993) Efficiency of least squares estimators in the presence of spatial autocorrelation. *Commun Stat Simul Comput* 22:1161–1179
- Coren S, Ward L, Enns J (1994) *Sensation and perception*. Harcourt Brace College Publishers, Fort Worth, TX
- Cortes C, Vapnik VN (1995) Support vector networks. *Mach Learn* 20:273–297
- Cortijo FJ, LA PDE, Blanca N (1998) Improving classical contextual classification. *Int J Remote Sens* 19(8):1591–1613
- Costanzo CM, Hubert L, Golledge RG (1983) A higher moment for spatial statistics. *Geogr Anal* 15:347–351
- Cote S, Tatnall ARL (1997) The Hopfield neural network as a tool for feature tracking and recognition from satellite sensor images. *Int J Remote Sens* 18(4):871–885
- Couloigner I, Ranchin T (2000) Mapping of urban areas: A multiresolution modeling approach for semi-automatic extraction of streets. *Photogramm Eng Rem Sens* 66(7):867–874
- Cox KR (1969) The voting decision in a spatial context. *Prog Geogr* 1:81–117
- Cressie NAC (1993) *Statistical for spatial data*. Wiley, New York
- Cristianini N, Shawe-Taylor J (2000) *An introduction to support vector machines: and other kernel-based learning methods*. Cambridge University Press, Cambridge
- Dacey MF (1960a) The spacing of river towns. *Ann Assoc Am Geogr* 50:59–61
- Dacey MF (1960b) The spacing of river towns. *Ann Assoc Am Geogr* 50:59–60
- Danforth S, Tomlinson C (1988) Type theories and object-oriented programming. *Comput Surv* 20(1):29–72

- Danuser G, Stricker M (1998) Parametric model fitting: from inlier characterization to outlier detection. *IEEE Trans Pattern Anal Mach Intell* 20(2):263–280
- Das Gupta S (1980) Discriminant analysis. In: Krishnaiah PR, Kanal L, Fisher RA (eds) *An appreciation*. Springer, New York, pp 161–170
- Dattareya GR, Kanal LN (1990) Estimation of mixing probabilities in multi-class finite mixtures. *J IEEE Trans Syst Man Cybern* 20:149–158
- Daubechies I (1992) *Ten lectures on wavelets*. Society for industrial and applied mathematics, Philadelphia, Pennsylvania, pp. 357
- Dave RN (1991) Characterization and detection of noise in clustering. *J Pattern Recogn Lett* 12:657–664
- Dave RN, Krishnapuram R (1997a) Robust clustering methods: a unified view. *J IEEE Trans Fuzzy Syst* 5:270–293
- Dave RN, Krishnapuram R (1997b) Robust clustering methods: a unified view. *IEEE Trans Fuzzy Syst* 5(2):270–293
- David B, Raynal L, Schorter G (1993) GeO₂: Why objects in a geographical DBMS? In: Abel D, Ooi BC (eds) *Advances in spatial databases: Proceedings of Third International Symposium, SSD'93*. Lecture notes in computer Science, vol 692. Springer, Berlin, pp 264–276
- Davis A, Marshak A, Wiscombe W, Cahalan R (1996) Scale invariance of liquid water distributions in marine stratocumulus. *J Atmos Sci* 53:1538–1558
- De Veaux RD (1989) Mixtures of linear regressions. *Comput Stat Data Anal* 8:227–245
- DeGaetano AT (1996) Recent trends in maximum and minimum temperature threshold exceedences in the northeastern United States. *J Clim* 9:1646–1660
- DeGaetano AT, Allen RJ (2002) Trends in twentieth-century temperature extremes across the United States. *J Clim* 15:3188–3205
- Dempster AP, Laird NM, Rubin DB (1977) Maximum likelihood estimation from incomplete data via EM algorithm. *J Roy Stat Soc B* 39:1–38
- Derin H (1987) Estimating components of univariate Gaussian mixtures using Prony's methods. *J IEEE Trans Pattern Anal Mach Intell* 9:142–148
- Di K, Li DL, Li DY (1998) A mathematical morphology based algorithm for discovering clusters in spatial databases. *J Image Graph* 3(3):173–178
- Djamdji J-P, Bijaoui A, Maniere R (1993) Geometrical registration of images: the multiresolution approach. *Photogr Eng Rem Sens* 59:645
- Dubes RO, Jain AK (1976) Clusterinf techniques: the user's dilemma. *J Pattern Recogn* 8:247–260
- Dubois D, Prade H (1980) *Fuzzy sets and systems: theory and applications*. Academic, Orlando
- Duda RO, Hart PF (1974) *Pattern classification and scene analysis*. Wiley, New York
- Efron B (1975) The efficiency of logistic regression compared to normal discriminant analysis. *J Am Stat Assoc* 70(352):892–898
- Eiumnoh A, Shrestha RP (2000) Application of DEM data to landsat image classification: evaluation in a tropical wet-dry landscape of Thailand. *Photogramm Eng Rem Sens* 66(3):297–304
- Ester M, Kriegel HP, Xu X (1995) Knowledge discovery in large spatial databases: focusing techniques for efficient class identification. In *Proceedings of the fourth international Symposium on large spatial databases (SSD'95)*, pp. 67–82
- Ester M, Kriegel HP, Sander J, Xu X (1996) A density-based algorithm for discovering clusters in large spatial databases with noise. In: *Proceedings of the second international conference on knowledge discovery and data mining*, Portland, Oregon, pp.324-331
- Ester M, Kriegel HP, Sander J, Xu X (1998) Clustering for Mining in Large Spatial Databases. *J Spec Issue Data Min, KI-J* 12(1):18–24
- Everitt BS (1993) *Cluster analysis*. Halsted Press, New York
- Falco T, Francis F, Lovejoy S, Schertzer D, Kerman B, Drinkwater M (1996) Scale invariance and universal multifractals in sea ice synthetic aperture radar reflectivity fields. *IEEE Trans Geosci Rem Sens* 34:906–914
- Falconer KJ (1985) *The geometry of fractal sets*. Cambridge University Press, Cambridge

- Fayyad U, Stolorz P (1997) Data mining and KDD: promise and challenges. *Future Gener Comput Syst* 13:99–115
- Feder J (1988) *Fractals*. Plenum Press, New York
- Feldman DS (1993) Fuzzy network synthesis with genetic algorithms. In: Forrest S (ed) *Proceedings of the 5th International conference on genetic algorithms*. Morgan Kaufmann, San Mateo, CA, pp 312–317
- Ferro CJS, Warner TA (2002) Scale and texture in digital image classification. *Photogramm Eng Rem Sens* 68(1):51–63
- Fischer MM, Getis A (eds) (1997) *Recent developments in spatial analysis: spatial statistics, behavioural modeling, and computational intelligence*. Springer, Berlin
- Fischer MM, Leung Y (1998) A genetic-algorithms based evolutionary computational neural network for modelling spatial interaction data. *Ann Reg Sci* 32:295–298
- Fischer MM, Leung Y (eds) (2001) *GeoComputational modelling. Techniques and applications*. Springer, Berlin
- Fisher RA (1936) The use of multiple measurements in taxonomic problems. *Ann Eugen* 7:179–188
- Fisher Y (ed) (1995) *Fractal image compression, theory and application*. Springer, New York
- Fitzpatrick DB (1976) An analysis of bank credit card profit. *J Bank Res* 7:199–205
- Fix E, Hodges JL (1951) Discriminatory analysis – nonparametric discrimination: consistency properties. Report No. 4, Project no. 21-29-004. USAF School of Aviation Medicine, Randolph Field, Texas. Reprinted in *Int Stat Rev* 57(1989):238–247
- Flygare AM (1997) A comparison of contextual classification methods using Landsat TM. *Int J Remote Sens* 18(18):3835–3842
- Foody GM (1995a) Land cover classification using and artificial neural network with ancillary information. *Int J Geogr Inform Syst* 9:527–542
- Foody GM (1995b) Using prior knowledge in artificial neural network classification with a minimal training set. *Int J Remote Sens* 16:301–312
- Foster SA, Gorr WL (1986) An adaptive filter for estimating spatially-varying parameters: application to modelling police hours spent in response to calls for service. *Manag Sci* 32:878–889
- Fotheringham AS (1997) Trends in quantitative methods I: stressing the local. *Prog Hum Geog* 21:88–96
- Fotheringham AS, Brunson C (1999) Local forms of spatial analysis. *Geogr Anal* 31:340–358
- Fotheringham AS, Pitts TC (1995) Directional variation in distance-decay. *Environ Plann A* 27:715–729
- Fotheringham AS, Brunson C, Charlton M (2002) *Geographically weighted regression – the Analysis of spatially varying relationships*. Wiley, Chichester
- Fotheringham AS, Charlton M, Brunson C (1997a) Measuring spatial variations in relationships with geographically weighted regression. In: Fischer MM, Getis A (eds) *Recent developments in spatial analysis*. Springer, London, pp 60–82
- Fotheringham AS, Charlton M, Brunson C (1997b) Two techniques for exploring non-stationarity in geographical data. *Geogr Syst* 4:59–82
- Friedman JH (1977) A recursive partitioning decision rule for nonparametric classification. *IEEE Trans Comput C-26*:404–408
- Friedman JH (1994) An overview of predictive learning and function approximation. In: Cherkassky V, Friedman JH, Wechsler H (eds) *Statistics to neural networks: Theory and pattern recognition applications*. Springer, Berlin, pp 1–61
- Frigui H, Krishnapuram R (1999) A robust competitive clustering algorithm with applications in computer vision. *J IEEE Trans Pattern Anal Mach Intell* 21(5):450–465
- Frisch U (1995a) *Turbulence*. Cambridge University Press, Cambridge
- Frisch U (1995b) *Turbulence. The legacy of A. Kolmogorov*. Cambridge University Press, Cambridge
- Fu L (1994) *Neural networks in computer intelligence*. McGraw-Hill, New York

- Fu Z (1997) Research on the earthquake activity mechanics in China's mainland. Earthquake Press, Beijing, pp 124–128
- Fu Z, Jiang L (1994) Strong earthquake clustering in the Fenwei and North China Plain seismic zones (in Chinese with English Abstract). *J Earthquake Res China* 10(2):160–167
- Fukunaga K, Hayes RR (1989) Estimation of classifier performance. *IEEE Trans Pattern Anal Mach Intell* 11:1087–1101
- Fung T (2003) Landscape dynamics in the Maipo Ramsar Wetland site. In Roy PS (ed) *Geoinformatics for tropical ecosystems. Asian association of remote sensing*. Bishen Singh Mahendra Pal Singh, Dehradun, India pp. 539–553
- Fung T, Leung Y, Xu ZB (2007) A vision-based approach to remote sensing image classification (a research project funded by the Hong Kong Research Grants Council)
- Fung T, Leung Y, Anh VV, Marafa LM (2001) A multifractal approach for modeling, visualization and prediction of land cover changes with remote sensing data (proposal of a research project)
- Gahegan MN, Roberts SA (1988) An intelligent, object-oriented geographical information system. *Int J Geogr Inform Syst* 2(2):101–110
- Ganter B, Wille R (1999) *Formal concept analysis: mathematical foundations*. Springer, Berlin
- Gao Y, Leung Y, Xu ZB (1996) A new genetic algorithm with no genetic operators (unpublished paper)
- Gaonac'h H, Lovejoy S, Schertzer D (2003) Multifractal analysis of infrared imagery of active thermal features at Kilauea volcano. *J Geophys Res* 24(11):2323–2344
- Garvey M, Jackson MS, Roberts M (2000) An object-oriented GIS. In: *Proceedings of Net. Object Days 2000, 9–12 October 2000, Erfurt, Germany*, pp. 604–613
- Gauchel C (2002) Use of wavelet transform for temporal characterization of remote watersheds. *J Hydrol* 269:101–121
- Geary RC (1954) The contiguity ratio and statistical mapping. *Inc Stat* 5:115–145
- Geisser S (1982) Bayesian discrimination. In: Krishnaiah PR, Kanal L (eds) *Hand book of statistics*, vol 2. North-Holland, Amsterdam, pp 101–120
- Getis A, Ord JK (1992) The analysis of spatial association by use of distance statistics. *Geogr Anal* 24:189–206
- Girosi F (1994) Regulation theory, radial basis functions, and networks. In: Cherkassky V, Friedman JH (eds) *From statistics to neural networks – Theory and pattern recognition applications*. Springer, Germany, pp 166–187
- Glymour C, Madigan D, Pregibon D, Symth P (1997) Statistical themes and lessons for data mining. *Data Min Knowl Disc* 1:11–28
- Goldberg DE (1989) *Genetic algorithms in search optimization and machine learning*. Addison-Wesley, New York
- Golin M, Sedgewick (1988) Analysis of a simple yet efficient convex hull algorithm. In: *Proceedings 4th Annual Symposium on Computational Geometry*, pp. 153–163
- Gomm JB, Yu D (2000) Selecting radial basis function network centers with recursive orthogonal least squares training. *IEEE Trans Neural Network* 11(2):306–314
- Gong P (1996) Integrated analysis of spatial data from multiple sources: using evidential reasoning and artificial neural network techniques for geological mapping. *Photogramm Eng Rem Sens* 62(5):513–523
- Gong P, Pu R, Chen J (1996) Mapping ecological land systems and classification uncertainties from digital elevation and forest-cover data using neural networks. *Photogramm Eng Rem Sens* 62(11):1249–1260
- Goodchild MF (1991) Issues of quality and uncertainty. In: Muller JC (ed) *Advances in cartography*. Elsevier, London, pp 113–139
- Goodchild MF (1992a) Geographical data modeling. *Comput Geosci* 18:401–408
- Goodchild MF (1992b) Geographical data modelling. *Comput Geosci* 18:401–408
- Goodchild MF, Gopal S (eds) (1989) *Accuracy of spatial databases*. Taylor and Francis, London

- Gopal S, Fischer MM (1997) Fuzzy ARTMAP – A neural classifier for multi-spectral image classification. In: Fischer MM, Getis A (eds) Recent developments in spatial analysis. Berlin, Spinger, pp 306–335
- Gorden RL (1977) Unidimensional scaling of social variables: concepts and procedures. The Free Press, New York
- Gorr WL, Olligschlaeger AM (1994) Weighted spatial adaptive filtering: Monte Carlo studies and application to illicit drug market modeling. *Geogr Anal* 26:67–87
- Gowda KC, Diday E (1992) Symbolic clustering using a new similarity measure. *J IEEE Trans Syst Man Cybern* 22:368–378
- Graham RL (1972) An efficient algorithm for determining the convex hull of a finite planar set. *Inform Process Lett* 1:132–133
- Granger CW (1980) Long memory relationships and the aggregation of dynamic models. *Econometrics* 48:227–238
- Grassberger P, Procaccia I (1983a) Measuring the strangeness of strange attractors. *Phys D* 9:189–208
- Grassberger P, Procaccia I (1983b) Characterisation of strange attractors. *Phys Rev Lett* 50:346–349
- Grégoire E, Konieczny S (2006) Logic-based approaches to information fusion. *Inform Fusion* 7 (1):4–18
- Griffith DA (1988) *Advanced spatial statistics*. Kluwer, Dordrecht
- Grossberg S (1976) Adaptive pattern classification and universal recording. I: Parallel development and coding neural feature detectors. *Biol Cybern* 23:121–134
- Guadagni P, Little J (1983) A logit model of brand choice calibrated on scanner data. *Market Sci* 2:203–238
- Guha S, Rastogi R, Shim K (1998) CURE: An efficient clustering algorithm for large databases. In: *Proceeding of the 1998 ACM-SIGMOD international conference management of data (SIGMOD'98)*, pp. 73–84
- Guibas L, Salesin D, Stolfi J (1993) Constructing strongly convex approximate hulls with inaccurate primitives. *J Algorithmica* 9:534–560
- Gunther O, Lamerts J (1994) Object-oriented techniques for the management of geographic and environmental data. *Comput J* 37:16–25
- Guttman L (1968) A general nonmetric technique for finding the smallest the smallest coordinate space for a configuration of points. *Psychometrika* 33:469–506
- Han JW, Nishio S, Kawano H, Wang W (1998) Generalization-based data mining in object-oriented databases using an object cube model. *Data Knowl Eng* 25:55–97
- Hand DJ (1982) *Kernel discriminant analysis*. Research Studies Press, Letchworth
- Hand DJ (1986) Recent advances in error rate estimation. *Pattern Recogn Lett* 4:335–346
- Hand DJ (1998) Data mining: statistics and more? *Am Stat* 52(2):112–118
- Hand DJ, Henley WE (1997) Statistical classification methods in consumer credit scoring. *J Roy Stat Soc Series A* 160:523–541
- Hart PE (1968) The condensed nearest neighbour rule. *IEEE Trans Inform Theor* 14:515–516
- Harvey DA, Gaonac'h H, Lovejoy S, Schertzer D (2002) Multifractal characterization of remotely sensed volcanic features: a case study from Kilauea volcano, Hawaii. *Fractals* 10(3):265–274
- Hastie TJ, Tibshirani RJ (1996) Discriminant analysis by Gaussian mixtures. *J R Stat Soc B* 58:155–176
- Hastie TJ, Tibshirani RJ (1990) *Generalized additive models*. Chapman and Hall, London
- Hathaway RJ, Bezdek JC (1993) Switching regression models and fuzzy clustering. *IEEE Trans Fuzzy Syst* 1(3):195–204
- Hathaway RJ, Bezdek JC (1994) NERF c-means non-Euclidean relational fuzzy clustering. *J Pattern Recogn* 27(3):429–437
- Hathaway RJ, Bezdek JC, Davenport JW (1994) On relational data versions of c-means algorithms. *J Pattern Recogn Lett* 17:607–612

- Hathaway RJ, Davenport JW, Bezdek JC (1989) Relational duals of c-means clustering algorithms. *J Pattern Recogn* 22(2):205–212
- Hawkins D (1980) Identification of outliers. Chapman and Hall, Boca Raton, FL
- Hearst MA, Scholkopf B, Dumais S (1998) Trends and controversies-support vector machines. *IEEE Intell Syst* 13(4):18–28
- Heermann PD, Khazenie N (1992) Classification of multi-spectral remote sensing data using a back-propagation neural network. *IEEE Trans Geosci Rem Sens* 30(1):81–88
- Heino R, Brazdil R, Forland E, Tuomenvirta H, Alexandersson H, Beniston M, Pfister C, Rebetz M, Rosenhagen G, Rosner S, Wibig J (1999) Progress in the study of climate extremes in northern and central Europe. *Clim Change* 42:151–181
- Hentschel HGE, Procaccia I (1983) The infinite number of generalized dimensions of fractals and strange attractors. *Phys D* 8:435–444
- Hepple LW (1998) Exact testing for spatial autocorrelation among regression residuals. *Environ Plann A* 30:85–109
- Hermes L, Friauff D, Puzicha J, Buhmann JM (1999) Support vector machines for land usage classification in Landsat TM imagery. In: *Proceeding of the IEEE international geoscience and remote sensing symposium*, vol. 1. Hamburg, pp. 348–350
- Heuvelink GBM (1998) Error propagation in environmental modelling with GIS. Taylor and Francis, London
- Hilfer R (2000) Fractional time evolution. In: Hilfer R (ed) *Fractional calculus in physics*. World Scientific, Singapore, pp 87–130
- Hinneburg A, Keim DA (1998) An efficient approach to clustering in large multimedia databases with noise. In: *Proceedings 1998 international conference knowledge discovery and data mining (KDD'98)*, pp. 58–65
- Hocking RR (1996) *Methods and applications of linear models*. Wiley, New York
- Holden M, Øksendal B, Ubøe J, Zhang TS (1996) *Stochastic partial differential equations. A modelling, white noise functional approach*. Birkhäuser, Boston
- Holland JH (1975) *Adaptation in natural and artificial systems*. University of Michigan Press, Ann Arbor
- Holmes QA, Nuesch DR, Schuchman RA (1984) Textural analysis and real-time classification of sea-ice types using digital SAR data. *IEEE Trans Geosci Remote Sens* GE-22:113–120
- Holsheimer M, Kersten M (1995) A perspective on databases and data mining. *Proceedings of 1st international conference on knowledge discovery and data mining*, pp. 150–155
- Honda K, Togo N, Fujii T, Ichihashi H (2002) Linear fuzzy clustering based on least absolute deviations. In: *Proceedings of 2002 IEEE international conference of fuzzy systems*, pp. 1444–1449
- Hopfield JJ (1982) Neural networks and physical systems with emergent collective computational abilities. *Proc Natl Acad Sci USA* 81:3088–3092
- Hosking JRM, Pednault EPD, Sudan M (1997) A statistical perspective on data mining. *Future Gener Comput Syst* 13:117–134
- Hosmer DW, Lemeshow S (1989) *Applied logistic regression*. Wiley, New York
- Hsu CN, Knoblock CA (1995) Estimating the robustness of discovered knowledge. In: *Proceedings of the first international conference on knowledge discovery and data mining*. Canada, Aug. 20–21, pp. 156–161
- Hu K, Ivanov PC, Chen Z, Carpena P, Eugene Stanley H (2001) Effect of trends on detrended fluctuation analysis. *Phys Rev E* 64(1):011114
- Huang Y, Leung Y (2002) Analysing regional industrialisation in jiangsu province using geographically weighted regression. *J Geogr Syst* 4(2):233–249
- Hubert L (1974) Approximate evaluation technique for the single-link and complete-link hierarchical clustering procedure. *J Am Stat Assoc* 69:968
- Hummel R, Moniot R (1989) Reconstructions from zero crossings in scale space. *IEEE Trans Acoust Speech Signal Process* 37(12):245–295

- Hwang YK, Ahuja N (1993) Cross motion planning – A survey. *ACM Comput Surv* 24 (3):219–291
- Imhof JP (1961) Computing the distribution of quadratic forms in normal variables. *Biometrika* 48:419–426
- Imielinski T, Mannila H (1996) A database perspective on knowledge discovery. *Commun ACM* 39:58–64
- Ishibuchi H, Nozaki K, Yamamoto N, Tanaka H (1995) Selecting fuzzy if-then rules for classification problems using genetic algorithms. *IEEE Trans Fuzzy Syst* 3(3):260–270
- Jain AK, Dubes RO (1998) Algorithms for clustering data. Prentice Hall, Englewood Cliffs, NJ
- Jenson JR (1996) Introductory to digital image processing: a remote sensing perspective. Prentice Hall, Upper Saddle River, NJ
- Jenson JR, Langari R (1999) Fuzzy logic: intelligence, control and information. Prentice Hall, Upper Saddle River, NJ
- Jevrejeva S, Moore JC, Grinsted A (2003) Influence of the arctic oscillation and El Niño-Southern Oscillation (ENSO) on ice conditions in the baltic sea: the wavelet approach. *J Geophys Res* 108(D21):4677. doi:10.1029/2003JD003417
- Ji M (2003) Using fuzzy sets to improve cluster labeling in unsupervised classification. *Int J Rem Sens* 24:657–671
- Ji Q, Haralick RM (1998) Breakpoint detection using covariance propagation. *IEEE Trans Pattern Anal Mach Intell* 20(8):845–951
- Jiang M, Ma Z (1985) A comparison between the third and fourth seismic periods in north china. *J Earthquake* 6:5–11
- Jiang XH, Liu CM, Huang Q (2003) Multiple time scales analysis and cause of runoff changes of the upper and middle reaches of the Yellow River. *Journal of Natural Resources* 18(2):142–147 (in Chinese)
- John GH (1995) Robust decision tree: removing outliers from databases. In: Proceedings of the first international conference on knowledge discovery and data mining. Canada, Aug. 20–21, 1995. pp. 174–179
- John GH, Langley P (1995) Estimating continuous distributions in Bayesian classifiers In Proceedings of the 11th conference on uncertainty in artificial intelligence. Morgan Kaufmann, San Mateo, CA
- Johnson RA, Wichern DW (1992) Applied multivariate statistical analysis, 3rd edn. Prentice-Hall, Englewood Cliffs, NJ
- Johnson SC (1967) Hierarchical clustering scheme. *J Psychometrika* 32:241
- Johnston RJ (1973) Spatial patterns and influences on voting in multi-candidate elections: the Christchurch City county elections, 1968. *Urban Stud* 10:69–81
- Jones JP III, Casetti E (1992) Applications of the expansion method. Routledge, London
- Jones RH, Stewart RC (1997) A method for determining significant structures in a cloud of earthquake. *J Geophys Res* 102:8245–8254
- Kagan YY (1999) Is earthquake seismology a hard, quantitative science? *J Pure Appl Geophys* 155:233–258
- Kagan YY, Jackson DD (1991) Long-term earthquake clustering. *Geophys J Int* 104:117–133
- Kahane J-P (1991) Produits de poids aléatoires indépendants et applications. In: Bélaïr J, Dubuc S (eds) *Fractal geometry and analysis*. Kluwer, Dordrecht, pp 277–324
- Kanellopoulos I, Wilkinson GG (1997) Strategies and best practice for neural network image classification. *Int J Rem Sens* 18(4):711–725
- Kantelhardt JW, Zschiegner SA, Koscielny-Bunde E, Halvin S, Bunde A, Stanley HE (2002) Multifractal detrended fluctuation analysis of nonstationary time series. *Phys A: Stat Mech Appl* 316(1–4):87–114
- Kantz H, Schreiber T (2004) *Nonlinear time series analysis*. Cambridge University Press, Cambridge
- Karr L (1991) Design of an adaptive fuzzy logic controller using a genetic algorithms. In: Belew RK, Booker LB (eds) *Proceedings of the 4th International Conference on Genetic Algorithms*. Morgan Kaufmann, San Mateo, CA, pp 450–457

- Karypis G, Han EH, Kumar V (1999) CHAMELEON: a hierarchical clustering algorithm using dynamic modeling. *Computer* 32:68–75
- Kaufman L, Rousseeuw PJ (1990) Finding groups in data: an introduction to cluster analysis. Wiley, New York
- Keerthi SS, Shevade SK, Bhattacharya U, Murthy KRK (2000) A fast iterative nearest point algorithm for support vector machine classifier design. *IEEE Trans Neural Network* 11 (1):124–136
- Keller JM, Chen S, Crownover RM (1989) Texture description and segmentation through fractal geometry. *Comput Graph Image Process* 45:150–166
- Kendall MG (1987) Kendall advanced theory of statistics, 5th edn. Charles Griffin, London
- Kim E, Park M, Ji S, Park M (1997) A new approach to fuzzy modeling. *IEEE Trans Fuzzy Syst* 5(3):328–337
- Kim W, Garza J, Keskin A (1993) Spatial data management in database systems: research directions. In: Abel D, Ooi BC (eds) *Advances in spatial databases: third International Symposium, SSD'93. Lecture notes in computer science, vol 692*. Springer, Berlin, pp 1–13
- Kirpatrick S, Gelatt CD, Vecchi MP (1983) Optimization by simulated annealing. *J Sci* 200:671–680
- Knoke JD (1986) The robust estimation of classification error rates. *Comput Math Appl* 12A:253–260
- Koenderink JJ (1984) The structure of images. *Biol Cybern* 50:363–370
- Koerts J, Abrahamse API (1968) On the power of the BLUS procedure. *J Am Stat Assoc* 63:1227–1236
- Kohavi R (1996) Scaling up the accuracy of naive-Bayes classifiers: a decision-tree hybrid. In: *Proceedings of the second international conference on knowledge discovery and data mining*. Morgan Kaufman, San Mateo CA
- Kohonen T (1982) Clustering, taxonomy, and topological maps of patterns. In: *Proceedings of the 6th international conference of pattern recognition*. Munich, Germany, pp. 114–128
- Kohonen T (1988) *Self-organization and associative memory*. Springer, Berlin
- Kontkanen P, Myllymaki P, Silander T, Tirri H (1998) BAYDA: software for Bayesian classification and feature selection. *Proceedings of the fourth international conference on knowledge discovery and data mining*. AAAI Press, Menlo Park, CA, pp. 254–258
- Kosko B (1992) *Neural networks and fuzzy systems*. Prentice-Hall, Englewood Cliffs, NJ
- Krämer W, Donninger C (1987) Spatial autocorrelation among errors and the relative efficiency of OLS in the linear regression model. *J Am Stat Assoc* 82:577–579
- Krishnapuram R, Keller JM (1993) A possibilistic approach to clustering. *J IEEE Trans Fuzzy Syst* 1:98–110
- Kryszkiewicz M (2001) Comparative study of alternative types of knowledge reduction in inconsistent systems. *Int J Intell Syst* 16:105–120
- Krzyszowski WJ (1977) The performances of Fisher's linear discriminant function under non-optimal conditions. *Technometrics* 19:191–199
- Kulkarni AD (1994) *Artificial neural networks for image understanding*. Van Nostrand Reinhold, New York
- Kulldorf M, Feuer E, Miller B, Freedman L (1997a) Breast cancer in Northeastern United States: a geographical analysis. *Am J Epidemiol* 146:161–170
- Kulldorf M, Feuer E, Miller B, Freedman L (1997b) Breast cancer in Northeastern United States: a geographical analysis. *Am J Epidemiol* 146:161–170
- Kurosu T, Yokoyama S, Fujita M (2001) Land use classification with textual analysis and the aggregation technique using multi-temporal JERS-1 L-band SAR images. *Int J Remote Sens* 22(4):595–613
- Labat D, Ababou R, Mangin A (2000) Rainfall-runoff relations for karstic springs. Part II: continuous wavelet and discrete orthogonal multi-resolution analyses. *J Hydrol* 238:149–178
- Labat D, Ronchail J, Guyot JL (2005) Recent advances in wavelet analyses: Part 2—Amazon, Parana, Orinoco and Congo discharges time scale variability. *J Hydrol* 314:289–311

- Laferrière A, Gaonac'h H (1999) Multifractal properties of visible reflectance fields from basaltic volcanoes. *J Geophys Res* 104:5115–5126
- Laferte J-M, Heitz F, Perez P, Fabre E (1995) Hierarchical statistical models for the fusion of multiresolution image data. In: Proceedings of 5th international conference on computer vision, 20–23 June 1995, pp. 908–913
- Lam NSN, De Cola L (eds) (1993) *Fractals in geography*. Prentice Hall, Englewood Cliffs, NJ
- Langley P, Sage S (1994) Induction of selective Bayesian classifiers. In: Proceedings of the 10th conference on uncertainty in artificial intelligence. Morgan Kaufmann, Seattle, WA,
- Lau K, Leung PL, Tse KA (1998) Nonlinear programming approach to metric unidimensional scaling. *J Classif* 15:2–14
- Lau KN, Yang CH, Post GV (1996) Stochastic preference modeling within a switching regression framework. *Comput Oper Res* 23(12):1163–1169
- Laurini R, Thompson D (1992) *Fundamentals of spatial information systems*. Academic, New York
- Lawrence KD, Arthur JL (eds) (1990) *Robust Regression*. Marcel Dekker, New York
- Lawson AB (2001) *Statistical methods in spatial epidemiology*. Wiley, Chichester
- Lee SC, Bajcsy P (2004) Multisensor raster and vector data fusion based on uncertainty modeling. In: ICIP '04. 2004 international conference on image processing, 5:3355–3358
- Lee T, Richards JA, Swain PH (1987) Probabilistic and evidential approaches for multisource data analysis. *IEEE Trans Geosci Rem Sens* 25(3):283–293
- Lepage R, Rouhana RG, St-onge B, Noumeir R, Desjardins R (2000) Cellular neural network for automated detection of geological lineaments on radarsat images. *J IEEE Trans Geosci Rem Sens* 38:1224–1233
- Leung Y (1982) Approximate characterization of some fundamental concepts of spatial analysis. *Geogr Anal Int J Theor Geogr* 14:19–40
- Leung Y (1984) Towards a flexible framework for regionalization. *Environ Plann A* 16:1613–1632
- Leung Y (1987) On the imprecision of boundaries. *Geogr Anal Int J Theor Geogr* 19:125–151
- Leung Y (1988a) *Spatial analysis and planning under imprecision*. Elsevier, Amsterdam
- Leung Y (1988b) Interregional equilibrium and fuzzy linear programming: 1. *Environ Plan A* 20:25–40
- Leung Y (1988c) Interregional equilibrium and fuzzy linear programming: 2. *Environ Plan A* 20:219–230
- Leung Y (1994) Inference with spatial knowledge: an artificial neural network approach. *Geogr Syst* 1:103–121
- Leung Y (1997) *Intelligent spatial decision support systems*. Springer, Berlin
- Leung Y (1999) Fuzzy sets approach to spatial analysis. In: Zimmermann H-J (ed) *Practical applications of fuzzy technologies, the handbooks of fuzzy sets series*. Kluwer, Norwell, MA, pp 267–300
- Leung Y (2001) Neural and evolutionary computation methods for spatial classification and knowledge acquisition. In: Fisher MM, Leung Y (eds) *GeoComputational modelling: techniques and applications*. Springer, Berlin, pp 71–108
- Leung Y, Leung KS (1993a) An intelligent expert system shell for knowledge-based geographical information systems: 1. the tools. *Int J Geogr Inform Syst* 7:189–199
- Leung Y, Leung KS (1993b) An intelligent expert system shell for knowledge-based geographical information systems: 2. some applications. *Int J Geogr Inform Syst* 7:201–213
- Leung Y, Li DY (2003) Maximal consistent block technique for rule acquisition in incomplete information systems. *Inform Sci* 153:85–106
- Leung Y, Ma JH (2006c) An optimization model for error propagation in the fusion of multi-source and multi-scale spatial information (unpublished paper)
- Leung Y, Gao Y, Xu ZB (1997a) Degree of population diversity – A perspective on premature convergence in genetic algorithms and its Markov chain analysis. *IEEE Trans Neural Network* 8:1165–1176

- Leung Y, Gao Y, Zhang WX (2001b) A genetic-based method for training fuzzy systems. In: Proceedings of the 10th IEEE international conference on fuzzy systems – meeting the ground challenge: machines that serve people, organized by the institute of electrical and electronics engineers. Australia, Melbourne
- Leung Y, Ge Y, Ma JH (2004e) Clustering of remote sensing data by unidimensional scaling (unpublished paper)
- Leung Y, Leung KS, He JZ (1999) A generic concept-based object-oriented geographical information system. *Int J Geogr Inform Sci* 13(5):475–498
- Leung Y, Leung KS, Lau CK (1997b) A development shell for intelligent spatial decision support systems: 1. Concepts and tools. *Geogr Syst* 4:19–37
- Leung Y, Leung KS, Ma JH (2003a) Data mining for bank databases (unpublished paper)
- Leung Y, Leung KS, Mei CL (2003b) Data mining for credit card promotion in the banking sector (unpublished paper)
- Leung Y, Leung KS, Yuan XJ (2003c) Discovery of promotion strategies for banking services by classification trees (unpublished paper)
- Leung Y, Li G, Xu ZB (1998) A genetic algorithm for multiple destination routing problem. *IEEE Trans Evol Comput* 2(4):150–161
- Leung Y, Luo JC, Zhou CH (2002a) A knowledge-integrated radial basis function model for the classification of multispectral remote sensing images (unpublished paper)
- Leung Y, Ma JH, Goodchild MF (2004b) A general framework for error analysis in measurement-based GIS, Part 1: The basic measurement-error model and related concepts. *J Geogr Syst* 6:325–354
- Leung Y, Ma JH, Goodchild MF (2004c) A general framework for error analysis in measurement-based GIS, Part 2: The algebra-based probability model for point-in-polygon analysis. *J Geogr Syst* 6:355–380
- Leung Y, Ma JH, Goodchild MF (2004d) A general framework for error analysis in measurement-based GIS, Part 3: Error analysis in intersections and overlays. *J Geogr Syst* 6:381–402
- Leung Y, Ma JH, Goodchild MF (2004e) A general framework for error analysis in measurement-based GIS, Part 4: Error analysis in length and area measurements. *J Geogr Syst* 6:403–428
- Leung Y, Ma JH, Zhang WX (2001b) A New method for mining regression classes in Large data sets. *IEEE Trans Pattern Anal Mach Intell* 23(1):5–21
- Leung Y, Ma JM, Zhang WX, Qiu GF (2008c) Discovery of hierarchical knowledge structure in geographical information systems – the concept lattice approach (unpublished paper)
- Leung Y, Mei CL, Wang N (2008b) A semi-parametric spatially varying coefficient model and its local-linearity-based estimation: a generalization of the mixed GWR model (unpublished paper)
- Leung Y, Mei CL, Zhang WX (2000a) Statistical tests for spatial non-stationarity based on geographically weighted regression model. *Environ Plann A* 32:9–32
- Leung Y, Mei CL, Zhang WX (2000b) Testing for spatial autocorrection among the residuals of the geographically weighted regression. *Environ Plann A* 32:871–890
- Leung Y, Mei CL, Zhang WX (2003d) Statistical test for local patterns of spatial association. *Environ Plann A* 35:725–744
- Leung Y, Wu WZ, Zhang WX (2006a) Knowledge acquisition in incomplete information systems: a rough set approach. *Eur J Oper Res* 168:164–180
- Leung Y, Zhang JS, Xu ZB (2000c) Clustering by scale-space filtering. *IEEE Trans Pattern Anal Mach Intell* 22(12):1396–1410
- Leung Y, Zhang JS, Xu ZB (1997c) Neural networks for convex hull computation. *IEEE Trans Neural Network* 8(3):606–611
- Leung Y, Zhang JS, Xu ZB (2000d) Clustering by scale-space filtering. *IEEE Trans Pattern Anal Mach Intell* 22:1396–1410
- Leung Y, Fischer MM, Wu WZ, Mi JS (2008c) A rough set approach for the discovery of classification rules in interval-valued information systems. *Int J Approx Reason* 47:233–246

- Leung Y, Fung T, Mi JS, Wu WZ (2007) A rough set approach to the discovery of classification rules in spatial data. *Int J Geogr Inform Sci* 21:1033–1058
- Leung Y, Leung KS, Zhao SP, Lau CK (1997d) A development shell for intelligent spatial decision support systems: 2. An application in flood simulation and damage assessment. *Geogr Syst* 4:39–57
- Leung Y, Luo JC, Ma JH, Ming DP (2006b) A new method for feature mining in remotely sensed image. *Geoinformatica* 10:295–312
- Leung Y, Luo JC, Zhou CH, Ma JH (2002b) Support vector machine for spatial feature extraction and classification of high resolution remote sensing images (unpublished paper)
- Li D, Shao J (1994) Wavelet theory and its application in image edge detection. *Int J Photogr Rem Sens* 49:4
- Li DR, Wang SL, Li DY (2006) Spatial data mining theories and applications. Science Publisher, Beijing
- Linneman HV (1996a) An econometric study of international trade flows. North-Holland, Amsterdam
- Linneman HV (1996b) An econometric study of international trade flows. North-Holland, Amsterdam
- Lippmann RP (1994) Neural networks, Bayesian a posteriori probabilities, and pattern classification. In: Cherkassky V, Friedman JH (eds) From statistics to neural networks— theory and pattern recognition applications. Germany, Springer, pp 83–104
- Loh WY, Vanichsetakul N (1988) Tree-structured classification via generalized discriminant analysis (with discussion). *J Am Stat Assoc* 83:715–728
- Lovejoy S, Schertzer D, Tessier Y, Gaonac'h H (2001) Multifractals and resolution-dependent remote sensing algorithm: the example of ocean colour. *Int J Rem Sens* 22:1191–1234
- Luo JC, Leung Y, Zheng J, Ma JH (2004) An elliptical basis function for the classification of remote sensing images. *J Geogr Syst* 6:219–236
- Ma Z, Jiang M (1987) Strong earthquake periods and episodes in China (in Chinese with English Abstract). *J Earthquake Res China* 3(1):47–51
- MacQueen J (1967) Some methods for classification and analysis of multivariate observations. In: Proceedings of 5th Berkeley Symposium on Mathematical Statistics and Probability, 1, pp. 281–297
- Maguire DJ, Goodchild MF, Rhind D (1991) Geographical information systems: principles and applications, Vol. 1: Principles; Vol.2: Applications. Longman, Harlow
- Mak M, Kung S (2000) Estimation of elliptical basis function parameters by the EM algorithm with application to speaker verification. *IEEE Trans Neural Network* 11(4):961–969
- Man Y, Gath I (1994) Detection and separation of ring-shaped clusters using fuzzy clustering. *J IEEE Trans Pattern Anal Mach Intell* 16:855–861
- Manago M, Kodratoff Y (1991) Induction of decision trees from complex structured data. In: Piatetsky-Shapiro G, Frawley WJ (eds) Knowledge discovery in databases. AAAI Press, Menlo Park, CA, pp 289–306
- Mandelbrot BB (1974) Intermittent turbulence in self-similar cascades: divergence of high moments and dimension of the carrier. *J Fluid Mech* 62:331–358
- Mandelbrot BB (1985) Self-affine fractals and fractal dimension. *Phys Scripta* 32:257–260
- Mandelbrot BB (1999a) Multifractals and 1/f noise: wild self-affinity in physics. Springer, New York
- Mandelbrot BB (1999b) Renormalization and fixed points in finance, since 1962. *Phys A* 263(1):477–487
- Mandelbrot BB, Van Ness LW (1968) Fractional Brownian motions, fractional noises and applications. *SIAM Rev* 10:422–437
- Mannan B, Roy J, Ray AK (1998) Fuzzy ARTMAP supervised classification of multi-spectral remotely-sensed images. *Int J Rem Sens* 19(4):767–774
- Maragos P (1989) Pattern spectrum and multiscale shape representation. *J IEEE Trans Pattern Anal Mach Intell* 11(7):701–716

- Mather PM (1999) Land cover classification revisited. In: Atkinson PM, Tate NJ (eds) *Advances in remote sensing and GIS analysis*. Wiley, London, pp 7–16
- McIver JP, Carmines EG (1981) *Unidimensional scaling*. Sage Publications, Beverly Hills, CA
- McLachlan GJ (1992) *Discriminant analysis and statistical pattern recognition*. Wiley, New York
- McLachlan GJ, Basford KE (1988) *Mixture models: inference and applications to clustering*. Marcel Dekker, New York
- McLachlan GJ, Krishnan T (1997) *The EM algorithm and extensions*. Wiley, London
- Medsker LR (1994) *Hybrid neural network and expert systems*. Kluwer, Dordrecht
- Mei CL, He SY, Fang KT (2004) A note on the mixed geographically weighted regression model. *J Reg Sci* 44:143–157
- Menard SW (1995) *Applied logistic regression analysis*. Sage Publication, Thousand Oaks, CA
- Meneveau C, Scrrnivasan KR (1991) The multifractal nature of turbulent energy dissipation. *J Fluid Mech* 224:429–484
- Meng DY, Xu ZB (2006) Visual learning theory (unpublished paper)
- Meng DY, Xu ZB, Leung Y, Fung T (2008) The strong convergence of visual method and its applications in disease diagnosis. Paper presented at the 3rd international conference on pattern recognition in bioinformatics, Melbourne Australia
- Mi JS, Wu WZ, Zhang WX (2004) Approaches to knowledge reduction based on variable precision rough sets model. *Inform Sci* 159:255–272
- Miline P, Milton S, Smith JL (1993) Geographical object-oriented databases—a case study. *Int J Geogr Inform Syst* 7:39–55
- Miller D, Rose K (1996) Hierarchical, unsupervised learning with growing via phase transitions. *J Neural Comput* 8:425–450
- Miller HJ, Han J (2001) *Geographic data mining and knowledge discovery*. Taylor and Francis, London
- Milne P, Milton S, Smith JL (1993) Geographical object-oriented databases – a case study. *Int J Geogr Inform Syst* 7:39–55
- Mola F, Siciliano R (1997) A fast splitting procedure for classification trees. *Stat Comput* 7:208–216
- Monin AS, Yaglom AM (1975) *Statistical fluid mechanism*, vol 2. MIT, Cambridge, MA
- Moody J, Darken CJ (1989) Fast learning in network of locally-tuned processing units. *Neural Comput* 1:281–294
- Moran PAP (1950) Notes on continuous stochastic phenomena. *Biometrika* 37:17–23
- Murai H, Omatu S (1997) Remote sensing image analysis using a neural network and knowledge-based processing. *Int J Rem Sens* 18(4):811–828
- Murray AT, Estivill-Castro V (1998) Cluster discovery techniques for exploratory spatial data analysis. *J Int J Geogr Inform Sci* 12:431–443
- Neter J, Kutner MH, Nachtsheim CJ, Wasserman W (1996) *Applied Linear Regression Models*, 4th edn. Irwin, Chicago
- Ng R, Han J (1994) Efficient and effective clustering method for spatial data mining. In: *Proceedings of 1994 international conference on very large data bases (VLDB'94)*, pp. 144–155
- Nicolin B, Cabler R (1987) A knowledge-based system for the analysis of aerial images. *IEEE Trans Geosci Rem Sens* 25(3):317–329
- Novikov EA (1994) Infinitely divisible distributions in turbulence. *Phys Rev E* 50(5):3303–3305
- O'hara Hines RJ (1997) An application of retrospective sampling in the analysis of a very large clustered data set. *J Stat Comput Simul* 59:63–81
- Ohashi Y (1984) Fuzzy clustering and robust estimation. In: 9th Meet. SAS Users Group International FL, Hollywood Beach
- Openshaw S (1993) Exploratory space-time-attribute pattern analysis. In: Fotheringham AS, Rogerson PA (eds) *Spatial Analysis and GIS*. Taylor and Francis, London, pp 147–163
- Openshaw S, Charlton M, Wymer C, Craft AW (1987) A mark I geographical analysis machine for the automated analysis of point data sets. *Int J Geogr Inform Syst* 1:359–377

- Ord JK, Getis A (1995) Local spatial autocorrelation statistics distributional issues and an application. *Geogr Anal* 27:286–306
- Ord JK, Getis A (2001) Testing for local spatial autocorrelation in the presence of global autocorrelation. *J Reg Sci* 41:411–432
- Osuna E, Freund R, Girosi F (1997) Training support vector machines: an application to face detection. In: *Proceedings of CVPR '97*. Puerto Rico
- Pao YH (1989) *Adaptive pattern recognition and neural networks*. Addison-Wesley, Reading, MA
- Paola JD, Schowengerdt RA (1995) A review and analysis of back-propagation neural networks for classification of remotely-sensed multi-spectral imagery. *Int J Rem Sens* 16:3033–3058
- Park D, Kandel A, Langholz G (1994) Genetic-based new fuzzy reasoning models with application to fuzzy control. *IEEE Trans Syst Man Cybern* 24(1):39–47
- Park KR, Lee C (1996) Scale-space using mathematical morphology. *J IEEE Trans Pattern Anal Mach Intell* 18(11):1121–1126
- Pawlak Z (1982) Rough sets. *Int J Inform Comput Sci* 11:341–356
- Pawlak Z (1991) *Rough sets: theoretical aspects of reasoning about data*. Kluwer, Boston
- Pearl J (1988) *Probabilistic reasoning in intelligent systems: networks of plausible inference*. Morgan Kaufmann, San Mateo, CA
- Pearson ES (1959) Note on an approximation to the distribution of non-central χ^2 . *Biometrika* 46:364
- Peddle DR (1995) Knowledge formulation for supervised evidential classification. *Photogramm Eng Rem Sens* 61(4):409–417
- Peleg S, Naor J, Hartley R, Avnir D (1984) Multiple resolution texture analysis and classification. *IEEE PAMI* 6:518–523
- Peng CK, Buldyrev SV, Havlin S, Simmons M, Stanley HE, Goldberger AL (1994) Mosaic organization of DNA nucleotides. *Phys Rev E* 49(2):1685
- Pentland A (1984) Fractal based description of natural scenes. *IEEE Trans PAMI* 6:661–674
- Pernell C, Themlin J, Renders J, Acheroy M (1995) Optimization of fuzzy expert systems using genetic algorithms and neural networks. *IEEE Trans Fuzzy Syst* 3(3):300–312
- Piramuthu S (1999) Feature selection for financial credit-risk evaluation. *Inform J Comput* 11(3):258–266
- Pliner V (1984) A class of metric scaling models. *J Autom Rem Contr* 47:560–567
- Pliner V (1996) Metric unidimensional scaling and global optimization. *J Classif* 13:3–18
- Podlubny I (1999) *Fractional differential equations*. Academic, San Diego, MA
- Pohl C, Van Genderen JL (1998) Multisensor image fusion in remote sensing: concepts, methods, and applications. *Int J Remote Sens* 19:823–854
- Polkowski L, Skowron A (eds) (1998) *Rough sets in knowledge discovery 1: methodology and applications, 2: Applications*. Physica-Verlag, Heidelberg
- Polkowski L, Tsumoto S, Lin TY (2000) *Rough set methods and applications*. Physica-Verlag, Heidelberg
- Postaire JG, Zhang RD, Botte CL (1993) Cluster Analysis by Binary Morphology. *J IEEE Trans Pattern Anal Mach Intell* 15(2):170–180
- Powell MJD (1987) Radial basis functions for multivariable interpolation: a review. In: Mason JC, Cox MG (eds) *Algorithms for Approximation of Functions and Data*. Oxford University Press, Oxford, pp 143–167
- Preparata FP (1979) An optimal real-time algorithm for planar convex hull. *Commun ACM* 22:402–405
- Preparata FP, Hong SJ (1977) Convex hulls of finite sets of points in two and three dimensions. *Commun ACM* 20:87–93
- Preparata FP, Shamos MI (1985) *Computational geometry: an introduction*. Springer, Berlin
- Prieto L, Herrera RG, Díaz J, Hernández E, Teso T (2004) Minimum extreme temperatures over Peninsular Spain. *Global Planet Change* 44:19–71
- Qian WH, Lin X (2004) Regional trends in recent temperature indices in China. *Clim Res* 27:119–134

- Qin CZ, Leung Y, Zhang JS (2006) Identification of seismic activities through visualization and scale-space filtering. In: Ruan D, D'hondt P, Fantoni PF, De Cock M, Nachtegael M, Kerre EE (eds) Applied artificial intelligence, proceedings of the 7th international FLINS conference. World Scientific, New Jersey, pp 643–650
- Quagliarella D, Periaux J, Poloni C, Winter G (eds) (1998) Genetic algorithms and evolution strategies in engineering and computer science. Wiley, England
- Quandt RE, Ramsey JB (1978) Estimating mixtures of normal distributions and switching regressions. *J Am Stat Assoc* 73(364):730–738
- Quattrochi DA, Goodchild MF (eds) (1997) Scale in remote sensing and GIS. CRC Lewis, Boca Raton, FL
- Quinlan JR (1986) Induction of decision trees. *Mach Learn* 1:81–106
- Rafanelli M, Ferri F, Maceratini R, Sindoni G (1995) An object oriented decision support system for the planning of health resource allocation. *Comput Methods Programs Biomed* 48(1–2):163–168
- Ramoni M, Sebastiani P (1996) Robust learning with missing data. Technical Report Kmi-TR-28, Knowledge Media Institute, The Open University
- Ranchin T, Wald L (1993) The wavelet transform for the analysis of remotely sensed data. *Int J Rem Sens* 14:615
- Rangarajan G, Ding M (eds) (2003) Processes with long-range correlations: theory and applications. Springer, Berlin
- Redner RA, Walker HF (1984) Mixture densities, maximum likelihood and the EM algorithm. *SIAM Rev* 26(2):195–239
- Rees WG (1995) Characterization of imaging of fractal topography. In: Wilkinson G (Ed.) *Fractals in geoscience and remote sensing*. Luxembourg: Office for Official Publications of the European Communities, pp. 298–325
- Richards JA, Jia XP (1998) Remote sensing digital image analysis: an introduction. Springer, New York
- Riedi RH, Crouse MS, Ribeiro VJ, Baraniuk RG (1999) A multifractal wavelet model with application to network traffic. *IEEE Trans Inform Theor* 45(3):992–1019
- Ripley BD (1996) Pattern recognition and neural networks. Cambridge University Press, Cambridge
- Roberts SJ (1997) parametric and non-parametric unsupervised clustering analysis. *J Pattern Recogn* 30(2):261–272
- Rose K, Gurewitz E, Fox G (1990) A deterministic annealing approach to clustering. *J Pattern Recogn Lett* 11:589–594
- Rosenblatt F (1958) The Perceptron: a probabilistic model for information storage and organization in the brain. *Psychol Rev* 65:386–408
- Rottensteiner FJ, Trinder SC, Kubik K (2005) Using the Dempster–Shafer method for the fusion of LIDAR data and multi-spectral images for building detection. *Inform Fusion* 6(4):283–300
- Rousseeuw PJ, Leroy AM (1987) Robust regression and outlier detection. Wiley, New York
- Royston JP (1982) An extension of Shapiro and Wilk's W test for normality to large samples. *Appl Stat* 31(2):115–124
- Rubinstein YD, Hastie TJ (1997) Discriminative vs informative learning. In: Proceedings of 3rd international conference on knowledge discovery and data mining. AAAI Press, Menlo Park, CA, pp. 49–53
- Rudolph G (1994) Convergence properties of canonical genetic algorithms. *IEEE Trans Neural Network* 5(1):96–101
- Rumelhart DE, McClelland JL, the PDP Research Group (1986) Parallel distributed processing: exploration in the microstructure of cognition, vol 1. MIT, Cambridge
- Sadjadi F (2005) Comparative image fusion analysis, 2nd Joint IEEE International Workshop on Object Tracking and Classification in and Beyond the Visible Spectrum (OTCBVS) Program. San Diego, CA, USA, June 20, 2005 (http://www.cse.ohio-state.edu/OTCBVS/05/OTCBVS-05-FINALPAPERS/W01_13.pdf)

- SAS Institute Inc (1995) Logistic regression examples using the SAS System, Version 6, vol 1. SAS Institute, Cary, NC
- Schistad Solberg AH, Jain AK, Taxt T (1994) Multisource classification of remotely sensed data: fusion of Landsat TM and SARimages. *IEEE Trans Geosci Rem Sens* 32(4):768–778
- Schistad Solberg AH, Taxt T, Jain AK (1996) A Markov random field model for classification of multisource satellite imagery. *IEEE Trans Geosci Rem Sens* 34:100–112
- Scholkopf B, Burges CJC, Smola AJ (1999) *Advances in kernel methods: support vector learning*. MIT, Cambridge
- Scholkopf B, Sung KK, Burges CJC, Girosi F, Niyogi P, Poggio T, Vapnik VN (1997) Comparing support vector machines with Gaussian Kernels to radial basis function classifiers. *IEEE Trans Signal Process* 45(11):2758–2765
- Sen S, Dave RN (1998) Clustering of relational data containing noise and outliers. In: *Proceedings of 1998 IEEE international conference on fuzzy systems 2*, pp. 1411–1416
- Serpico SB, Bruzzone L, Roli F (1996) An experimental comparison of neural and statistical non-parametric algorithms for supervised classification of remote-sensing images. *Pattern Recogn Lett* 17:1331–1341
- Shafer G (1976) *A mathematical theory of evidence*. Princeton, Princeton University Press
- Sheikholeslami G, Chatterjee S, Zhang A (1998) WaveCluster: a multi-resolution clustering approach for very large spatial databases. In: *Proceedings of 1998 international conference on very large data bases (VLDB'98)*, pp. 428–439
- Simantiraki E (1996) Unidimensional scaling: a linear programming approach minimizing absolute deviations. *J Classif* 13:19–25
- Simone G, Morabito FC, Farina A (2000) Radar image fusion by multiscale Kalman filtering. *FUSION 2000*. In: *Proceedings of the 3rd international conference on information fusion, 10–13 July 2000, Vol. 2, pp WED3/10 - WED3/17*
- Simpson EH (1951) The interpretation of interaction in contingency tables. *J Roy Stat Soc B* 13:238–241
- Skowron A, Rauszer C (1992) The discernibility matrices and functions in information systems. In: Slowinski R (ed) *Intelligent decision support-Handbook of applications and advances of the rough sets theory*. Kluwer, London, pp 331–362
- Smith CAB (1947) Some examples of discrimination. *Ann Eugen* 13:272–282
- Sokal RR, Oden NL, Thomson BA (1998) Local spatial autocorrelation in a biological model. *Geogr Anal* 30:331–354
- Stanfill C, Waltz D (1986) Toward memory-based reasoning. *Commun ACM* 29:1213–1228
- Stell JG, Worboys MF (1998) Stratified map spaces: a formal basis for multiresolution spatial databases. In: Poiker TK, Chisman N (eds) *SDH'98 proceedings 8th international symposium on spatial data handling*. International Geographical Union, pp. 180–189
- Steward JB, Angman ET, Feddes TA, Kerr Y (eds) (1966) *Scaling up in hydrology using remote sensing*. Wiley, London
- Stewart CV (1995) MINPRAN: a new robust estimator for computer vision. *IEEE Trans Pattern Anal Mach Intell* 17(10):925–938
- Stuart A, Ord JK (1994) *Kendall's advanced theory of statistics, vol 1, 6th edn, Distribution theory*. Edward Arnold, London
- Sundararajan N, Saratchandran P, Lu Y (1999) Radial basis function neural networks with sequential learning. World Scientific, Singapore
- Tadjudin S, Landgrebe DA (2000) Robust parameter estimation for mixture model. *IEEE Trans Geosci Rem Sens* 38(1):439–445
- Tang AY, Adams TM, Usery EL (1996) A spatial data model design for feature-based geographical information systems. *Int J Geogr Inform Syst* 10:643–659
- Taven P, Grubmuller H, Huhnel H (1990) Self-organization of associative memory and pattern classification: recurrent signal processing on topological feature maps. *J Biol Cybern* 64:95–105

- Thomas LC, Crook JN, Edelman DB (eds) (1992) Credit scoring and credit control. Clarendon Press, Oxford
- Tiefelsdorf M (1998) Some practical applications of Moran's I 's exact conditional distribution. *Pap Reg Sci* 77:101–129
- Tiefelsdorf M (2000) Modelling spatial processes: the identification and analysis of spatial relationships in regression residuals by means of Moran's I . Springer, Berlin
- Tiefelsdorf M, Boots B (1995) The exact distribution of Moran's I . *Environ Plann A* 27:985–999
- Tiefelsdorf M, Boots B (1996) Letter to the editor: the exact distribution of Moran's I . *Environ Plann A* 28:1900
- Tiefelsdorf M, Boots B (1997) A note on the extremities of local Moran's I_i s and their impact on global Moran's I . *Geogr Anal* 29:248–257
- Tinkler KJ (1971) Statistical analysis of tectonic patterns in areal volcanism: the Bunyaraguru volcanic field in Western Uganda. *Math Geol* 3:335–355
- Titterton DM, Smith AFM, Makov UE (1987) Statistical analysis of finite mixture distributions. Wiley, New York
- Tong H (1990) Non-linear time series: a dynamical system approach. Oxford University Press, New York
- Ulfarsson MO, Benediktsson JA, Sveinsson JR (2003) Data fusion and feature extraction in the wavelet domain. *Int J Remote Sens* 24:3933–3945
- Unwin A (1996) Exploratory spatial analysis and local statistics. *Computation Stat* 11:387–400
- Vapnik VN (1995) The nature of statistical learning theory. Springer, New York
- Vapnik VN (1998) Statistical learning theory. Wiley, London
- Vapnik VN (1999) An overview of statistical learning theory. *IEEE Trans Neural Network* 10 (5):988–999
- Vaughan RA, Antony R, Kirby RP (1988) Geographical information systems and remote sensing for local resource planning. Remote Sensing Products and Publications, Dundee
- Vergin H (1995) Developing and testing of an error propagation model for GIS overlay operations. *Int J Geogr Inform Syst* 9:595–619
- Waldemark J (1997) An automated procedure for cluster analysis of multivariate satellite data. *J Int J Neural System* 8(1):3–15
- Wand MP, Jones MC (1995) Kernel smoothing. Chapman and Hall, London
- Wang F (1991) Integrating GIS's and remote sensing image analysis systems by unifying knowledge representation schemes. *IEEE Trans Geosci Rem Sens* 29(4):656–663
- Wang F, Newkirk R (1998) A knowledge-based systems for highway network extraction. *IEEE Trans Geosci Rem Sens* 26(5):525–531
- Wang L, Souza PG (2004) Integration of pixel-based and object-based classification for mapping mangroves with IKONOS imagery. *Int J Remote Sens* 25(24):5655–5668
- Wang M, Leung Y, Zhou CH, Pei T, Luo JC (2006) A mathematical morphology based scale space method for the mining of linear features in geographic data. *Data Min Knowl Discov* 12:97–118
- Wang N, Mei CL, Yan XD (2005) Analysis of spatial relationship between mean and extreme temperatures in China with geographically weighted regression technique (unpublished paper)
- Wang N, Mei CL, Yan XD (2008) Local linear estimation of spatially varying coefficient models: an improvement on the geographically weighted regression technique. *Environ Plann A* 40 (4):986–1005
- Wang SL, Li D, Shi WZ, Wang XZ (2002) Geo-rough space. *Geo-Spatial Inform Sci* 6:54–61
- Wang SL, Wang XZ, Shi WZ (2001) Development of a data mining method for land control. *Geo-Spatial Inform Sci* 4:68–76
- Wang W, Yang J, Muntz R (1997) STING: A Statistical Information Grid Approach to Spatial Data Mining. In: Proceedings of 1997 interface conference on very large data bases (VLDB'97), pp. 186–195
- Wennmyr E (1989) A convex hull algorithm for neural networks. *J IEEE Trans Circuits Syst* 36:1478–1484

- Wilhelm A, Steck R (1998) Exploring spatial data by using interactive graphics and local statistics. *Statistician* 47:423–430
- Wilkinson GG, Folving S, Kanellopoulos I, McCormick N, Fullerton K, Megier J (1995) Forest mapping from multi-source satellite data using neural network classifiers - an experiment in Portugal. *Rem Sens Rev* 12:83–106
- Wille R (1982) Restructuring lattice theory: an approach based on hierarchies of concepts. In: Rival I (ed) *Ordered Sets*. Reidel, Dordrecht, pp 445–470
- Wilson R, Spann M (1990) A new approach to clustering. *J Pattern Recogn* 23(12):1413–1425
- Witkin AP (1983) Scale space filtering. In: *Proceedings of International Joint Conference on Artificial Intelligence*, Karlsruhe, pp. 1019–1022
- Witkin AP (1984) Scale space filtering: a new approach to multi-scale description. In: Ullman S, Richards W (eds) *Image understanding*. Norwood, NJ, Ablex
- Wolfer J, Roberge J, Grace T (1994) Robust multi-spectral road classification in Landsat thematic mapper imagery. In *Proceedings of World Congress on Neural Networks – San Diego*, I260–I268
- Wolke R, Schwetlik H (1988) Iteratively reweighted least squares: algorithms, convergence and numerical comparisons. *SIAM J Sci Stat Comput* 9:907–921
- Wong HS, Guan L (2001) A neural learning approach for adaptive image restoration using a fuzzy model-based network architecture. *J IEEE Trans Neural Network* 12:516–531
- Wong YF (1993) Clustering data by melting. *J Neural Comput* 5(1):89–104
- Worboys MF (1992) A generic model for planar geographical objects. *Int J Geogr Inform Syst* 6:353–372
- Worboys MF (1994) Object-oriented approaches to geo-referenced information. *Int J Geogr Inform Syst* 8:385–399
- Worboys MF (1998a) Computation with imprecise geographical data. *Comput Environ Urban Syst* 22:85–106
- Worboys MF (1998b) Imprecision in finite resolution spatial data. *GeoInformatica* 2:257–279
- Worboys MF, Hearnshaw HM, Maguire DJ (1990) Object-oriented data modeling for spatial databases. *Int J Geogr Inform Syst* 4(4):369–383
- Wu WZ, Zhang M, Li HZ, Mi JS (2005) Knowledge reduction in random information systems via Dempster-Shafer theory of evidence. *Inform Sci* 174:143–164
- Xu ZB, Leung Y (2004) How neural networks can be made more effective and efficient: a view of learning theory (unpublished paper)
- Xu ZB, Leung Y, He XW (1994) Asymmetric bidirectional associative memories. *IEEE Trans Syst Man Cybern* 24:1558–1564
- Yan Z, Yang C, Jones P (2001) Influence of inhomogeneity on the estimation of mean and extreme temperature trends in Beijing and Shanghai. *Adv Atmos Sci* 18:309–321
- Yao X (1999) Evolving artificial neural networks. In: *Proceedings of the IEEE 89*, IEEE, pp. 1423–1447
- Yasdi R (1996) Combining rough sets learning and neural learning: method to deal with uncertain and imprecise information. *Neuralcomputing* 7:61–84
- Yu JG, Leung Y, Chen YQ, Zhang Q (2008) Multifractal analyses of daily rainfall in the Pearl River delta of China (unpublished paper)
- Zadeh LA (1994) Fuzzy logical and soft computing: issues, contentions and perspectives. In: *Proceedings of 3rd international conference on fuzzy logical, neural networks and soft computing*. Fuzzy Logic Systems Institute, Japan, pp. 1–2
- Zhai PM, Pan XH (2003) Trends in temperature extremes during 1951–1999 in China. *Geophys Res Lett* 30(17):1913
- Zhai PM, Sun AJ, Ren FM, Liu XN, Gao B, Zhang Q (1999) Changes of climate extremes in China. *Clim Change* 42:203–218
- Zhang D, Lutz T (1989) Structural control of igneous complexes and kimberlites: a new statistical method. *J Tectonophys* 159:137–148
- Zhang JS, Leung Y (2001) A method for robust fuzzy relational clustering (unpublished paper)

- Zhang Q, Xu CY, Becker S, Jiang T (2006a) Sediment and runoff changes in the Yangtze past 50 years. *J Hydrol* 331:511–523
- Zhang TS, Ramakrishnan R, Livny M (1996) BIRCH: an efficient data clustering method for very large databases. In: *Proceedings of 1996 ACM-SIGMOD International Conference on Management of Data (SIGMOD'96)*, pp. 103–114
- Zhang WX, Mi JS (2004) Incomplete information system and its optimal selections. *Comput Math Appl* 48:691–698
- Zhang WX, Leung Y, Wu WZ (2003a) *Information systems and knowledge discovery*. Science Press, Beijing in Chinese
- Zhang WX, Mi JS, Wu WZ (2003b) Approaches to knowledge reductions in inconsistent systems. *Int J Intell Syst* 18:989–1000
- Zhang WX, Xu ZB, Leung Y, Leung KS (2006b) Theory of inclusion. *Fuzzy Math Syst* 10(4):1–9 in Chinese
- Zhang Y (2000) A method for continuous extraction of multispectrally classified urban rivers. *Photogramm Eng Rem Sens* 66(8):991–999
- Zhang Y, Hong G (2005) An IHS and wavelet integrated approach to improve pan-sharpening visual quality of natural colour IKONOS and QuickBird images. *Inform Fusion* 6(3):225–234
- Zhou W (1999) Verification of the non-parametric characteristics of back-propagation neural networks for image classification. *IEEE Trans Geosci Rem Sens* 37(2):771–779
- Zhuang X, Huang Y, Zhao Y (1996) Gaussian mixture density modeling, decomposition, and applications. *IEEE Trans Image Process* 5(9):1293–1301
- Zhuang X, Wang T, Zhang P (1992) A highly robust estimator through partially likelihood function modeling and its application in computer vision. *J IEEE Trans Pattern Anal Mach Intell* 14:19–35
- Zupan B, Bohanec M (1997) A database decomposition approach to data mining and machine discovery. In: *Proceedings of 1st international conference on knowledge discovery and data mining*, pp. 299–303

Author Index

A

Abrahamse, A.P.I., 255
Acharya, R.N., 276
Acton, S.T., 37
Aha, D.W., 99
Ahlqvist, O., 197
Ahuja, N., 86
Aldridge, C.H., 197
Allenby, G.M., 118
Allen, R.J., 250
Amari, S., 191
Amorese, D., 37
Anderberg, M.R., 15
Anderson, J.A., 99
Andreo, B., 286
Angulo, C., 136, 316
Angulo, J.M., 314, 316
Anh, V.V., 292, 293, 296, 297, 303,
307–309, 313–316
Ankerst, M., 71
Anselin, L., 223–228, 235, 237, 254, 255,
258
Arbia, G., 64, 225
Arbib, M.A., 157
Asano, T., 37
Atallah, M.J., 85
Atkinson, P.M., 156, 162, 216

B

Babaud, J., 17
Bacry, E., 286

Bajcsy, P., 325
Ball, G., 15
Banfield, J.D., 15
Bao, S., 225, 226
Barnett, V., 29
Basak, J., 82
Basford, K.E., 71, 172, 260, 265, 266
Benediktsson, J.A., 156–158, 162, 165
Beniston, M., 250, 251
Bennett, R.J., 277
Bentley, J.L., 85
Beran, J., 277, 278
Berkson, J., 99
Bern, M.W., 85
Bezdek, J.C., 15, 37, 50, 51, 54, 55, 59, 61
Bischof, H., 157
Bishop, C.M., 144, 158
Bittner, T., 197
Blatt, M., 14, 48
Blum, R.S., 326
Bonsal, B.R., 250, 251
Boots, B., 224–226, 232, 255
Borgas, M.S., 295
Box, G.E.P., 277, 278
Breiman, L., 143–145, 153, 156
Brown, M., 131
Brunsdon, C., 224, 225, 237, 240, 254, 258
Bruzzone, L., 71, 158, 169, 173
Burges, C., 141
Burges, C.J.C., 130, 141
Burrige, P., 255
Burrough, P.A., 322

C

Cao, Z., 43, 184
 Carmines, E.G., 62
 Caron, F., 325
 Carpenter, G.A., 89, 140, 144, 162
 Casetti, E., 237, 259
 Catala, A., 136
 Caudill, S.B., 276
 Celeux, G., 15
 Chakravarthy, S.V., 48
 Chen, H., 158
 Chen, T., 158
 Chen, Z., 318
 Chmielewski, M.R., 201
 Cihlar, J., 313
 Civco, D.L., 157
 Cleveland, W.S., 224, 237, 240, 254
 Cliff, A.D., 223, 224, 254
 Collett, D., 99
 Cordy, C.B., 254
 Coren, S., 25, 28, 217, 219
 Costanzo, C.M., 226
 Cox, K.R., 224
 Cressie, N.A.C., 223
 Curran, P.J., 216

D

Dacey, M.F., 224
 Danforth, S., 322
 Darken, C.J., 158
 Das Gupta, S., 98
 Daubechies, I., 278, 282
 Dave, R.N., 50, 53–55, 71, 72, 261
 David, B., 322
 Davis, A., 314
 De Cola, L., 313
 DeGaetano, A.T., 250
 Dempster, A.P., 172
 Derin, H., 71
 Devlin, S.J., 237, 254
 Di, K., 38
 Ding, M., 278
 Djamdji, J-P., 313
 Donninger, C., 254
 Dubes, R.O., 13–15, 50
 Dubois, D., 183
 Duda, R.O., 13

E

Efron, B., 130
 Eiumnoh, A., 165
 Ester, M., 38, 39, 71
 Estivill-Castro, V., 13
 Everitt, B.S., 13

F

Falconer, K.J., 297
 Falco, T., 313
 Feder, J., 318
 Feldman, D.S., 183
 Ferro, C.J.S., 216
 Fischer, M.M., 158, 162
 Fisher, R.A., 98
 Fisher, Y., 286
 Fitzpatrick, D.B., 113
 Fix, E., 98
 Foody, G.M., 158
 Foster, S.A., 237
 Fotheringham, A.S., 225, 237, 240, 258
 Friedman, J.H., 143
 Frigui, H., 50
 Frisch, U., 277, 293, 295
 Fukunaga, K., 221
 Fu, L., 43, 158
 Fung, T., 205, 215, 218, 314, 315
 Fu, Z., 39, 43, 158

G

Gahegan, M.N., 322
 Ganter, B., 323
 Gaonac'h, H., 314
 Gao, Y., 189
 Garvey, M., 322
 Gath, I., 82
 Gaucherel, C., 286
 Geary, R.C., 225, 254
 Geisser, S., 98
 Getis, A., 157, 224–227, 229, 230
 Ghosh, J., 48
 Giroso, F., 144, 160
 Goldberg, D.E., 78, 144
 Golin, M., 85
 Gomm, J.B., 171
 Gong, P., 158

Goodchild, M.F., 313, 322, 324, 325
 Gopal, S., 162, 325
 Gorden, R.L., 62
 Gorr, W.L., 237
 Govaert, G., 15
 Gowda, K.C., 60
 Graham, R.L., 85
 Granger, C.W., 277
 Grassberger, P., 308, 309
 Grégoire, E., 324
 Griffith, D.A., 225, 254, 255
 Grossberg, S., 89, 144, 162
 Grzymala-Busse, J.W., 201
 Guadagni, P., 118
 Guan, L., 82
 Guha, S., 14
 Guibas, L., 85
 Gunther, O., 322
 Guttman, L., 62, 63

H

Hall, D., 15, 37
 Hand, D.J., 97, 102, 221, 305
 Han, E.H., 15
 Han, J., 13, 15
 Han, J.W., 13
 Hart, P.E., 13, 99
 Harvey, D.A., 314
 Hastie, T.J., 98, 100, 113, 114, 130
 Hathaway, R.J., 50, 54–56, 59, 61
 Hawkins, D., 29
 Hayes, R.R., 221
 Hearst, M.A., 141
 Heermann, P.D., 158
 Heino, R., 251
 Henley, W.E., 97, 102
 Henry, M., 225, 226
 Hentschel, H.E., 295
 Hepple, L.W., 225, 232, 255
 Hermes, L., 131
 Heuvelink, G.B.M., 325
 Heyde, C.C., 314
 Hilfer, R., 314, 315
 Hinneburg, A., 71
 Hocking, R.R., 241, 254
 Hodges, J.L., 98
 Holden, M., 314, 315

Holland, J.H., 78, 183
 Honda, K., 37
 Hong, G., 325
 Hopfield, J.J., 144
 Hosmer, D.W., 99
 Hsu, C.N., 261
 Huang, Q., 43
 Huang Y., 244
 Hubert, L., 14
 Hu, K., 317, 318
 Hummel, R., 17, 218
 Hwang, Y.K., 86

I

Imhof, J.P., 232, 234, 255–257
 Ishibuchi, H., 183, 184, 186, 195

J

Jackson, D.D., 43
 Jain, A.K., 13–15, 50
 Jenkins, G.M., 277, 278
 Jenson, J.R., 201
 Jevrejeva, S., 286
 Jiang, M., 43, 44
 Jiang, X.H., 287
 Jia, X.P., 156
 Ji, M., 201
 John, G.H., 261
 Johnson, R.A., 58
 Johnson, S.C., 14
 Johnston, R.J., 224
 Jones, J.P. III., 237
 Jones, M.C., 98, 257
 Jones, R.H., 37

K

Kagan, Y.Y., 43
 Kahane, J-P., 295
 Kanal, L.N., 71
 Kantelhardt, J.W., 317
 Kantz, H., 277
 Karr, L., 183
 Karypis, G., 14, 15
 Katoh, N., 37
 Kaufman, L., 14, 15, 50, 56

- Keerthi, S.S., 141
 Keim, D.A., 71
 Keller, J.M., 54, 313
 Kendall, M.G., 267
 Kersten, M., 338
 Khazenie, N., 158
 Kim, W., 322
 Kirpatrick, S., 15
 Knoblock, C.A., 261
 Knoke, J.D., 221
 Kodratoff, Y., 322
 Koenderink, J.J., 17, 25, 218
 Koerts, J., 255
 Kohavi, R., 101, 112
 Kohonen, T., 15, 144
 Konieczny, S., 324
 Kosko, B., 145, 183
 Krishnan, T., 71, 172
 Krishnapuram, R., 50, 54, 71, 72, 261
 Kryszkiewicz, M., 202
 Kulkarni, A.D., 156
 Kulldorf, M., 224
 Kung, S., 172, 175, 176
- L**
- Labat, D., 286
 Laferrière, A., 314
 Laferte, J.-M., 324
 Lamerts, J., 322
 Lam, K.C., 313
 Lam, N.S.N., 313
 Landgrebe, D.A., 71, 178
 Langari, R., 201
 Langley, P., 101, 261
 Lau, K., 62
 Laurini, R., 322
 Lawson, A.B., 84
 Lee, C., 37
 Lee, S.C., 325
 Lee, T., 324
 Lemeshow, S., 99
 Leonenko, N.N., 315, 316
 Lepage, R., 82
 Leung, K.S., 64, 102, 105, 110, 112, 115,
 118, 119, 122, 129, 147, 148, 156, 201,
 202, 224, 227, 229, 230, 233–235, 287
 Leung, P.L., 50, 52, 54–56, 58, 144, 158
 Leung, Y., 15, 17, 26, 28–30, 32, 38, 48, 50,
 62, 84, 85, 87, 89, 90, 92, 158, 165, 178,
 183, 184, 191, 235, 241, 242, 244, 249,
 254–257, 259, 262, 263, 265, 267–270,
 273–275, 322, 323, 326
 Lewis, T., 29
 Li, D.Y., 196
 Linneman, H.V., 224
 Lin, X., 151
 Lippmann, R.P., 160, 175
 Little, J., 118
 Loh, W.Y., 144
 Lovejoy, S., 313, 314
 Luo, J.C., 173, 174, 176, 178
 Lutz, T., 37
- M**
- MacQueen, J., 15
 Maguire, D.J., 322
 Mahata, D., 82
 Mak, M., 172, 175, 176
 Manago, M., 322
 Mandelbrot, B.B., 278, 279, 297
 Mannan, B., 162
 Man, Y., 82
 Maragos, P., 37
 Marshak, A., 297
 Mather, P.M., 156
 Ma, Z., 43, 44
 McClelland, J.L., 144
 McIver, J.P., 62
 McLachlan, G.J., 71, 98, 172, 260,
 265, 266
 Medsker, L.R., 158
 Mei, C.L., 252
 Menard, S.W., 118
 Meneveau, C., 293
 Meng, D.Y., 218, 219
 Mi, J.S., 202
 Miller, D., 14, 48
 Miller, H.J., 13
 Milne, P., 322
 Mola, F., 148
 Monin, A.S., 296
 Moniot, R., 17, 218
 Moody, J., 158
 Moran, P.A.P., 225, 254
 Mukherjee, D.P., 37

Murai, H., 158
Murray, A.T., 13

N

Neter, J., 254
Ng, R., 15
Novikov, E.A., 302

O

O'hara Hines, R.J., 276
Ohashi, Y., 50
Omatu, S., 158
Openshaw, S., 224, 237
Ord, J.K., 223–227, 229, 230, 254

P

Pan, X.H., 251
Paola, J.D., 157
Pao, Y.H., 156
Park, D., 183, 184
Pawlak, Z., 145, 196, 200
Pearl, J., 101
Pearson, E.S., 234
Peddle, D.R., 158
Peleg, S., 313
Peng, C.K., 318
Pentland, A., 313
Pernell, C., 183
Piramuthu, S., 102
Pitts, T.C., 237
Pliner, V., 62, 63
Podlubny, I., 315
Pohl, C., 324, 325
Polkowski, L., 196
Postaire, J.G., 37
Powell, M.J.D., 99, 158
Prade, H., 183
Preparata, F.P., 85, 95
Prieto, D.F., 158, 169, 173
Prieto, L., 251
Procaccia, I., 295, 308, 309

Q

Qian, W.H., 251
Qin, C.Z., 43

Quattrochi, D.A., 313, 324
Quinlan, J.R., 143, 144

R

Rafanelli, M., 322
Raftery, A.E., 15
Ramoni, M., 112
Ranchin, T., 313
Rangarajan, G., 278
Rauszer, C., 204
Redner, R.A., 260
Rees, W.G., 313
Rey, S., 226
Richards, J.A., 156
Riedi, R.H., 286
Ripley, B.D., 144
Roberts, S.A., 322
Roberts, S.J., 14, 27, 48
Rose, K., 14, 15, 48
Rosenblatt, F., 144
Rossi, P.E., 118
Rottensteiner, F.J., 324
Rousseuw, P.J., 14, 15, 50, 56
Rubinstein, Y.D., 100, 130
Rudolph, G., 188
Rumelhart, D.E., 144

S

Sadjadi, F., 325
Sage, S., 101
SAS Institute Inc., 121, 127
Schistad Solberg, A.H., 324
Scholkopf, B., 134, 136, 141, 160
Schowengerdt, R.A., 157
Schreider, T., 277
Sebastiani, P., 112
Sedgewick, 85
Sen, S., 50, 54
Serpico, S.B., 160
Shafer, G., 165
Shamos, M.I., 95
Shao, J., 313
Shawe-Taylor, J., 130
Sheikholeslami, G., 15
Shrestha, R.P., 165
Siciliano, R., 148
Simantiraki, E., 62

Simone, G., 325
 Simpson, E.H., 223
 Skowron, A., 196, 204
 Smith, C.A.B., 98
 Sokal, R.R., 225, 226
 Spann, M., 14, 23
 Stanfill, C., 99
 Steck, R., 225
 Stell, J.G., 197
 Stephenson, D.B., 250, 251
 Stewart, C.V., 266
 Stuart, A., 235
 Sundararajan, N., 144

T

Tadjudin, S., 71, 173, 178
 Tang, A.Y., 322
 Tatnall, A.R.L., 156, 162
 Taven, P., 14, 48
 Thomas, L.C., 113
 Thompson, D., 322
 Tibshirani, R.J., 98, 113, 114
 Tiefelsdorf, M., 225, 226, 232, 235, 255
 Tinkler, K.J., 224
 Titterington, D.M., 276
 Tomlinson, C., 322
 Tong, H., 277

U

Ulfarsson, M.O., 325
 Unwin, A., 225

V

Van Genderen, J.L., 325
 Vanichsetakul, N., 144
 Van Ness, L.W., 278
 Vapnik, V.N., 99, 130, 266
 Vaughan, R.A., 322

W

Waldemark, J., 14, 48
 Wald, L., 313
 Walker, H.F., 260

Waltz, D., 99
 Wand, M.P., 98, 237, 240
 Wang, F., 165
 Wang, M., 38
 Wang, N., 38, 252, 259
 Wang, S.L., 38, 197
 Wang, W., 15
 Wang, X.Z., 197
 Warner, T.A., 216
 Wennmyr, E., 85
 Wichern, D.W., 58
 Wilhelm, A., 225
 Wilkinson, G.G., 156, 158
 Wille, R., 323
 Wilson, R., 14, 23, 48
 Witkin, A.P., 17, 218
 Wong, H.S., 82
 Wong, Y.F., 48
 Worboys, M.F., 197, 322
 Wu, W.Z., 202

X

Xu, Z.B., 100, 144, 218, 219

Y

Yaglom, A.M., 296
 Yan, Z., 251
 Yao, X., 158
 Yasdi, R., 196
 Yu, D., 171
 Yu, J.G., 319

Z

Zadeh, L.A., 183
 Zhai, P.M., 251
 Zhang, D., 37
 Zhang, M., 325
 Zhang, Q., 289
 Zhang, T.S., 14, 323
 Zhang, W.X., 202, 289
 Zhang, X., 50, 52, 54–56, 58
 Zhang, Y., 325
 Zhou, W., 157
 Zhuang, X., 71, 72, 261, 266–268

Subject Index

A

Algorithm

- expectation maximization (EM), 15, 71, 114, 172, 173, 176–183, 260, 261
- Gaussian mixture density decomposition (GMDD), 71, 72, 261
- Guttman, 63
- learning, 144, 157, 158, 162, 164
- Pliner, 63–64
- regression-class mixture decomposition (RCMD), 71, 72, 74–78, 260–276

Approximation

- lower, 198–200
- Pawlak, 198
- upper, 198–200

B

Bayes

- naive, 100–102, 105–113, 143
- rules, 98, 100, 101

Boolean

- function, 204, 207, 208, 212
- reasoning, 203, 204

- Brownian motion, fractional, 278, 286, 297–299

C

Classification

- accuracy, 106, 117, 165, 169, 210–213, 215, 216
- algorithmic, 137, 216
- image, 37, 165, 216, 217

- land cover, 138, 139, 141, 159, 166–172, 178

- rates, 129, 151, 153, 156, 195, 196, 220
- of remote sensing data, 194–196
- rules, 7, 8, 11, 12, 97, 100–103, 113, 143–221, 267, 274, 321, 322
- statistical, 97–100
- supervised, 100, 131, 137, 162
- unsupervised, 97
- vision-based, 217–220

- Classification and regression tree (CART), 143–156

Classifier

- Gaussian, 157
- maximum likelihood (MLC), 167, 181, 197
- non-parametric statistical, 99
- parametric statistical, 98, 117, 169

- Client segmentation, 102–112, 117–119, 148–156

Cluster

- characterization, 84–96
- compactness of, 44, 45, 48
- isolation of, 28
- lifetime of, 26, 29, 31, 39, 42
- validity check, 17, 25–29, 43

Clustering

- fuzzy, 50, 56, 57
- hierarchical
 - life time of, 30
 - nested, 14, 21, 26, 29, 30, 33
 - non-nested, 14, 21–22, 26, 29, 31
- mixture decomposition, 17, 70–84

- partitioning, 14, 16, 17, 49, 62
- robust fuzzy relational, 49–61
- Concept lattice, 323, 324
- Convex hull
 - circumscribed approximation of, 87
 - inscribed approximation of, 87
- D
- Data
 - mining, 1–4, 7, 10–13, 16, 17, 37, 71, 74, 97, 100, 112, 145, 156, 173, 197, 223, 224, 234, 271, 276, 277, 279, 286, 321–325, 327
 - multi-scale, 3, 4, 10, 321, 324–326
 - multi-source, 3–5, 157, 321, 324–326
 - multi-type, 3, 5, 327
 - object-oriented, 5, 323
 - raster-based, 326
 - relational spatial, 322–324
 - remote sensing, 156, 157, 173, 194–196, 201, 279, 312–316
 - temporal, 3–5, 11, 42, 277–319, 321, 322, 327
 - time series, 5, 12, 277–297, 307–312
 - vector-based, 3, 36–42, 325
- Decision
 - table, 199, 200, 202, 212
 - trees, 143, 144
- Dimension
 - box-counting, 308
 - correlation, 295, 308, 309
 - information, 295, 307, 308
- Discriminant analysis
 - linear (LDA), 98–101, 105, 110, 111, 113–117, 130, 143
 - mixture, 98, 113–117
 - quadratic, 98
- Distribution
 - mixture, 17, 70–74, 172, 173, 224, 263
 - spatial, 65, 74, 246–251, 253, 285
- E
- Earthquakes, 6, 37, 39, 43–49, 317
- Error
 - analysis, 325
 - matrix, 67, 70, 140, 141, 167, 168, 172, 180, 182, 209
 - propagation, 325, 326
- Extreme temperature, 3, 250–252
- F
- Feature
 - mining of, 75, 80–84
 - selection, 101–102, 215
- Fractal
 - geometry, 313
 - mono, 296, 297, 317, 319
 - multi, 279, 286, 293–298, 301–303, 307–311, 313, 314, 317, 319
- Fuzzy
 - adaptive resonance theory (ART), 162, 163
 - classification, 145, 183–186, 190, 194, 195
 - c-line, 37, 41, 42
 - c-mean, 16, 51, 55, 56
 - graph, 16
 - logic, 184, 324
 - partition, 144, 183, 184, 194
 - relational data, 16, 49–61
 - relationship matrix, 185, 186, 190, 191, 193
 - rules, 183–196
 - sets, 15, 143–145, 183, 194, 197, 216
 - systems, 183, 184, 186, 190–195
- G
- Gaussian
 - curve, 239
 - distribution, 72, 75, 157, 280
 - mixture, 31, 71, 72, 174, 176, 177
- Geary's *c*
 - global, 225, 226, 229
 - local, 225, 227–229, 234
- Genetic algorithm
 - canonical, 186–189
 - with no genetic operator (GANGO), 184, 186–196
- G statistic, 227, 229–231
- I
- Information system
 - geographical (GIS)

- measurement-based, 325
 - object-oriented, 5, 322
 - raster-based, 326
 - vector-based, 160, 322, 326
- interval-valued, 200–205
- real-valued, 197, 198, 200
- Intermittency, 279, 292–307, 314

- K
- Kernel methods, 98, 99
- Knowledge
 - reduction, 202, 203, 323

- L
- Learning
 - supervised, 97, 162
 - unsupervised, 13, 162
- LISA, 225–227, 230, 234, 235, 258
- Long-range
 - correlation, 2, 317, 319
 - dependence, 278, 279, 292–301, 303, 312–319

- M
- Markov chain, 188, 189
- Matrix
 - discernibility, 203, 204
 - dissimilarity, 50, 55, 57, 59–62
 - error, 67, 70, 140, 141, 167, 168, 172, 180, 182, 209
 - weighting, 238–240, 244, 245
- Missing values, 11, 102–105, 110, 115, 117–119, 148, 153, 221
- Moran's I
 - global, 225, 226
 - local, 225–228, 234
- Multifractal
 - analysis, 307–308, 313
 - detrended fluctuation analysis (MF-DFA), 317
- Multiplicative cascade, 295, 301–302, 307, 308

N

- Neural network
 - adaptive resonance theory (ART), 82, 89
 - convex hull computing (CHCNN), 85–89
 - elliptical basis function (EBF), 172–183
 - knowledge integrated, 158–172
 - multilayer feedforward, 100, 144, 157, 160, 197
 - radial basis function (RBF), 48, 99, 130, 136, 137, 140, 144, 158–172, 174
 - recurrent, 144
- Noise, treatment of, 16, 20

O

- Operator
 - crossover, 79, 187
 - mutation, 79, 144, 187–189
 - selection, 187
- Outliers, 3, 11, 14–17, 29, 35, 37, 47, 50, 51, 54, 55, 71, 73–76, 81, 86, 216, 260, 261, 263–268, 270, 272, 273, 276

Q

- Quadratic form
 - distribution of, 232, 234
 - ratio of, 226–235

R

- Rainfall intensity, 279, 309–312
- Random walk, 278, 314
- Reduction, classification, 214
- Regional industrialization, 244–250
- Regression
 - class
 - mixture decomposition (RCMD), 71, 75–78, 224
 - geographically weighted
 - goodness-of-fit test of, 240–244
 - spatial correlation in, 254–258
 - logistic, 12, 99, 100, 117–119, 121, 122, 124–127, 129, 130, 143
 - varying parameter, 224, 236–237, 260
- Remotely sensed
 - data, 62, 66–70, 156, 159, 169, 172, 178, 194, 197, 200, 205–214, 275, 325, 326

- image, 3, 4, 7, 32–36, 67, 69, 71, 74, 75, 80–84, 158, 159, 162, 165, 173, 178, 214, 218, 275, 313, 325
 - Remote sensing, multiscaling, 312–316
 - Rough set, 145, 196–216, 323
 - Runoff changes, 286–292
- S**
- Scale
 - characteristic, 278
 - invariant, 10, 278, 313
 - Scale space
 - clustering, 20, 29, 32, 33, 35, 36, 42–45
 - filtering, 17–49
 - theory, 18–20, 49, 218, 220
 - Scaling
 - behavior, 10, 12, 278, 279, 295, 317–319, 322
 - multidimensional (MDS), 62
 - multiple, 279, 292–293, 314
 - parameter, 279
 - unidimensional (UDS), 16, 61–70
 - Seismic
 - belts, 3, 6, 36–42
 - episode, 43–45, 47
 - Self-similarity, 12, 278, 279, 286, 322
 - Separation surfaces, 12, 97–221
 - Spatial
 - association, 7, 12, 223–235, 258, 321
 - autocorrelation, 3, 11, 223, 231, 233–235, 252, 254–258
 - non-stationarity, 224, 236–254, 260–276
 - relationship, 1, 5, 12, 223–276
 - variability, 279, 307–313
 - Support vector machine (SVM)
 - linear, 135
 - nonlinear, 134–137
- T**
- Time series
 - non-stationary, 278, 279, 301, 317, 318
 - scaling in, 278–293, 317–319
 - stationary, 278, 317
 - Tree
 - classification and regression (CART), 143, 145–156
 - decision, 143, 144
- W**
- Wavelet
 - Harr, 280, 281
 - Mexican hat, 280, 282, 285, 290
 - Morlett, 282–284
 - transform
 - continuous, 280–284, 290
 - discrete, 280, 284–285