

# Workshop: spatial data analysis

Roger Bivand\*

4–5 October 2018

## 1 Thursday

### References

- Belsley, D. A., Kuh, E., and Welsch, R. E. (1980). *Regression Diagnostics: Identifying Influential Data and Sources of Collinearity*. John Wiley & Sons, New York.
- Bivand, R. (2015). Spatial diffusion and spatial statistics: Revisiting hägerstrand's study of innovation diffusion. *Procedia Environmental Sciences*, 27:106 – 111. Spatial Statistics conference 2015.
- Bivand, R. (2017). Revisiting the Boston data set — changing the units of observation affects estimated willingness to pay for clean air. *REGION*, 4(1):109–127.
- Bivand, R., Sha, Z., Osland, L., and Thorsen, I. S. (2017). A comparison of estimation methods for multilevel models of spatially structured data. *Spatial Statistics*, 21:440–459.
- Bivand, R. S. (1980). Nowe podejście do problemu przekazu informacji w modelach dyfuzji. *Sprawozdania PTPN, Wydzia Matematyczno-Przyrodniczy*, 96:20–23.
- Cliff, A. D. (1970). Computing the spatial correspondence between geographical patterns. *Transactions of the Institute of British Geographers*, 50:143–154.
- Cliff, A. D. and Ord, J. K. (1973). *Spatial Autocorrelation*. Pion, London.
- Gilley, O. W. and Pace, R. K. (1996). On the harrison and rubinfeld data. *Journal of Environmental Economics and Management*, 31(3):403–405.

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- Gotway, C. A. and Young, L. J. (2002). Combining incompatible spatial data. *Journal of the American Statistical Association*, 97:632–648. pp. 17.
- Harrison, D. and Rubinfeld, D. L. (1978). Hedonic housing prices and the demand for clean air. *Journal of Environmental Economics and Management*, 5:81–102.
- Hägerstrand, T. (1953). *Innovationsforloppet ur Korologisk Synspunkt*. Gleerup, Lund.
- Hägerstrand, T. (1967). On monte carlo simulation of diffusion. In Garrison, W. L., editor, *Quantitative Geography: Economic and Cultural Topics*, number 13 in Studies in Geography, pages 1–32. Northwestern University.
- Ingram, G. K. and Fauth, G. R. (1974). *TASSIM: A Transportation and Air Shed SIMulation model, volume 1. case study of the Boston region*. Department of City and Regional Planning, Harvard University.
- Ingram, G. K., Fauth, G. R., and Kroch, E. A. (1974). *TASSIM: A Transportation and Air Shed SIMulation model, volume 2: program user's guide*. Department of City and Regional Planning, Harvard University.
- Kamiński, Z. (1988). Räumliche simulation in der diffusionsforschung. *Erdkunde*, 42:225–233.
- Lam, N. S. N., Arenas, H., Pace, K., LeSage, J., and Campanella, R. (2012). Predictors of business return in new orleans after hurricane katrina. *PLOS ONE*, 7(10):1–8.
- LeSage, J., Pace, R. K., Campanella, R., Lam, N., and Liu, X. (2011a). Do what the neighbours do. *Significance*, 8(4):160–163.
- LeSage, J. P., Kelley Pace, R., Lam, N., Campanella, R., and Liu, X. (2011b). New orleans business recovery in the aftermath of hurricane katrina. *Journal of the Royal Statistical Society: Series A (Statistics in Society)*, 174(4):1007–1027.
- Pace, R. K. and Gilley, O. (1997). Using the spatial configuration of the data to improve estimation. *Journal of the Real Estate Finance and Economics*, 14:333–340.
- Pebesma, E. (2018). Simple Features for R: Standardized Support for Spatial Vector Data. *The R Journal*, 10(1):439–446.
- Tennekes, M. (2018). tmap: Thematic maps in r. *Journal of Statistical Software, Articles*, 84(6):1–39.
- Tinline, R. (1971). Linear operators in diffusion research. In Chisholm, M., Frey, A. E., and Haggett, P., editors, *Regional Forecasting: Proceedings of the Twenty-Second Symposium of the Colston Research Society*, pages 71–81. Butterworth, London.

## 2 Friday

### References

- Bakar, K. and Sahu, S. (2015). sptimer: Spatio-temporal bayesian modeling using r. *Journal of Statistical Software, Articles*, 63(15):1–32.
- Brooks, M. E., Kristensen, K., van Benthem, K. J., Magnusson, A., Berg, C. W., Nielsen, A., Skaug, H. J., Mächler, M., and Bolker, B. M. (2017). glmmTMB Balances Speed and Flexibility Among Packages for Zero-inflated Generalized Linear Mixed Modeling. *The R Journal*, 9(2):378–400.
- Bucklin, D. and Basille, M. (2018). rpostgis: Linking R with a PostGIS Spatial Database. *The R Journal*, 10(1):251–268.
- Bürkner, P.-C. (2017). brms: An r package for bayesian multilevel models using stan. *Journal of Statistical Software, Articles*, 80(1):1–28.
- Bürkner, P.-C. (2018). Advanced Bayesian Multilevel Modeling with the R Package brms. *The R Journal*, 10(1):395–411.
- Finley, A., Banerjee, S., and Gelfand, A. (2015). spbayes for large univariate and multivariate point-referenced spatio-temporal data models. *Journal of Statistical Software, Articles*, 63(13):1–28.
- Gräler, B., Pebesma, E., and Heuvelink, G. (2016). Spatio-Temporal Interpolation using gstat. *The R Journal*, 8(1):204–218.
- Jenness, S., Goodreau, S., and Morris, M. (2018). Epimodel: An r package for mathematical modeling of infectious disease over networks. *Journal of Statistical Software, Articles*, 84(8):1–47.
- Jing, L. and Oliveira, V. D. (2015). geocount: An r package for the analysis of geostatistical count data. *Journal of Statistical Software, Articles*, 63(11):1–33.
- Lee, D. (2013). Carbayes: An r package for bayesian spatial modeling with conditional autoregressive priors. *Journal of Statistical Software, Articles*, 55(13):1–24.
- Lee, D., Rushworth, A., and Napier, G. (2018). Spatio-temporal areal unit modeling in r with conditional autoregressive priors using the carbayesst package. *Journal of Statistical Software, Articles*, 84(9):1–39.
- Meyer, S., Held, L., and Höhle, M. (2017). Spatio-temporal analysis of epidemic phenomena using the r package surveillance. *Journal of Statistical Software, Articles*, 77(11):1–55.

- Moraga, P. (2018). Small Area Disease Risk Estimation and Visualization Using R. *The R Journal*, 10(1):495–506.
- Muenchow, J., Schratz, P., and Brenning, A. (2017). RQGIS: Integrating R with QGIS for Statistical Geocomputing. *The R Journal*, 9(2):409–428.
- Simon, T., Fabsic, P., Mayr, G. J., Umlauf, N., and Zeileis, A. (2018). Probabilistic forecasting of thunderstorms in the eastern alps. *Monthly Weather Review*, 146(9):2999–3009.
- Suesse, T. (2018a). Estimation of spatial autoregressive models with measurement error for large data sets. *Computational Statistics*, 33(4):1627–1648.
- Suesse, T. (2018b). Marginal maximum likelihood estimation of sar models with missing data. *Computational Statistics & Data Analysis*, 120:98 – 110.
- Suesse, T. and Zammit-Mangion, A. (2017). Computational aspects of the em algorithm for spatial econometric models with missing data. *Journal of Statistical Computation and Simulation*, 87(9):1767–1786.
- Taylor, B. and Rowlingson, B. (2017). spatsurv: An r package for bayesian inference with spatial survival models. *Journal of Statistical Software, Articles*, 77(4):1–32.
- Umlauf, N., Klein, N., and Zeileis, A. (2018). Bamlss: Bayesian additive models for location, scale, and shape (and beyond). *Journal of Computational and Graphical Statistics*, 0(0):1–16.
- Weller, Z. (2018). sptest: An r package implementing nonparametric tests of isotropy. *Journal of Statistical Software, Articles*, 83(4):1–24.