

Bibliography

- [1] Aarts, G., Fieberg, J., and Matthiopoulos, J. (2012). Comparative interpretation of count, presence–absence and point methods for species distribution models. *Methods in Ecology and Evolution*, 3(1):177–187.
- [2] Affandi, R. H., Fox, E. B., Adams, R. P., and Taskar, B. (2014). Learning the parameters of determinantal point process kernels. In *Thirty-First International Conference on Machine Learning (ICML)*.
- [3] Affandi, R. H., Fox, E. B., and Taskar, B. (2013). Approximate inference in continuous determinantal processes. In *Advances in Neural Information Processing Systems 26 (NIPS)*.
- [4] Albert, J. H. and Chib, S. (1993). Bayesian analysis of binary and polychotomous response data. *Journal of the American statistical Association*, 88(422):669–679.
- [5] Andersen, M. (1992). Spatial analysis of two-species interactions. *Oecologia*, 91(1):134–140.
- [6] Andrieu, C. and Thoms, J. (2008). A tutorial on adaptive MCMC. *Statistics and Computing*, 18(4):343–373.
- [7] Augustin, N., Muggleston, M., and Buckland, S. (1996). An autologistic model for the spatial distribution of wildlife. *Journal of Applied Ecology*, pages 339–347.
- [8] Baddeley, A. (2010). Multivariate and marked point processes. In *Handbook of Spatial Statistics*, pages 373–404. CRC Press.
- [9] Baddeley, A., Møller, J., and Pakes, A. G. (2008). Properties of residuals for spatial point processes. *Annals of the Institute of Statistical Mathematics*, 60(3):627–649.
- [10] Baddeley, A., Rubak, E., and Turner, R. (2015). *Spatial point patterns: methodology and applications with R*. CRC Press.
- [11] Baddeley, A. and Turner, R. (2000). Practical maximum pseudolikelihood for spatial point patterns. *Austrian and New Zealand Journal of Statistics*, 42:283–315.
- [12] Baddeley, A. and Turner, R. (2005). spatstat: an R package for analyzing spatial point patterns. *Journal of Statistical Software*, 12(6):1–42.
- [13] Baddeley, A. and Turner, R. (2014). Bias correction for parameter estimates of spatial point process models. *Journal of Statistical Computation and Simulation*, 84(8):1621–1643.
- [14] Baddeley, A., Turner, R., Møller, J., and Hazelton, M. (2005). Residual analysis for spatial point processes (with discussion). *Journal of the Royal Statistical Society: Series B (Statistical Methodology)*, 67(5):617–666.
- [15] Baddeley, A. J., Møller, J., and Waagepetersen, R. (2000). Non- and semi-parametric estimation of interaction in inhomogeneous point patterns. *Statistica Neerlandica*, 54(3):329–350.
- [16] Banerjee, S., Carlin, B. P., and Gelfand, A. E. (2014). *Hierarchical modeling and analysis for spatial data*. CRC Press.

- [17] Banerjee, S., Gelfand, A. E., Finley, A. O., and Sang, H. (2008). Gaussian predictive process models for large spatial data sets. *Journal of the Royal Statistical Society: Series B (Statistical Methodology)*, 70(4):825–848.
- [18] Barber, J. J., Gelfand, A. E., and Silander, J. A. (2006). Modelling map positional error to infer true feature location. *Canadian Journal of Statistics*, 34(4):659–676.
- [19] Beaumont, M. A., Zhang, W., and Balding, D. J. (2002). Approximate Bayesian computation in population genetics. *Genetics*, 162:2025–2035.
- [20] Benes, V., Bodlák, K., Møller, J., and Waagepetersen, R. P. (2003). Application of log Gaussian Cox processes in disease mapping. In *The ISI International Conference on Environmental Statistics and Health*, pages 95–105. University of Santiago de Compostela.
- [21] Berger, J. O., Bernardo, J. M., and Sun, D. (2009). The formal definition of reference priors. *The Annals of Statistics*, 37(2):905–938.
- [22] Berman, M. and Turner, T. R. (1992). Approximating point process likelihoods with GLIM. *Applied Statistics*, pages 31–38.
- [23] Bernardo, J. M. and Smith, A. F. (1994). *Bayesian Theory*. John Wiley & Sons.
- [24] Berthelsen, K. K. and Møller, J. (2002). A primer on perfect simulation for spatial point processes. *Bulletin of the Brazilian Mathematical Society*, 33:351–367.
- [25] Berthelsen, K. K. and Møller, J. (2003). Likelihood and non-parametric Bayesian MCMC inference for spatial point processes based on perfect simulation and path sampling. *Scandinavian Journal of Statistics*, 30(3):549–564.
- [26] Berthelsen, K. K. and Møller, J. (2008). Non-parameteric Bayesian inference for inhomogeneous Markov point processes. *Australian & New Zealand Journal of Statistics*, 50(3):257–272.
- [27] Besag, J. (1974). Spatial interaction and the statistical analysis of lattice systems. *Journal of the Royal Statistical Society: Series B (Methodological)*, pages 192–236.
- [28] Besag, J. (1986). On the statistical analysis of dirty pictures. *Journal of the Royal Statistical Society: Series B (Statistical Methodology)*, 48:259–302.
- [29] Besag, J. and Diggle, P. J. (1977). Simple monte carlo tests for spatial pattern. *Applied Statistics*, pages 327–333.
- [30] Besag, J. E. (1975). Statistical analysis of non-lattice data. *The Statistician*, 24:179–195.
- [31] Blum, M. G. B. and Tran, V. C. (2010). HIV with contact tracing: a case study in approximate Bayesian computation. *Biostatistics*, 11:644–660.
- [32] Brix, A. and Møller, J. (2001). Space-time multi type log Gaussian Cox processes with a view to modelling weeds. *Scandinavian Journal of Statistics*, 28(3):471–488.
- [33] Carlin, B. P. and Louis, T. A. (2008). *Bayesian methods for data analysis*. CRC Press.
- [34] Carpenter, B., Gelman, A., Hoffman, M. D., Lee, D., Goodrich, B., Betancourt, M., Brubaker, M., Guo, J., Li, P., and Riddell, A. (2017). Stan: A probabilistic programming language. *Journal of Statistical Software*, 76(1).
- [35] Carroll, R. J., Ruppert, D., Crainiceanu, C. M., and Stefanski, L. A. (2006). *Measurement error in nonlinear models: a modern perspective*. Chapman and Hall/CRC.
- [36] Caspary, W. and Scheuring, R. (1993). Positional accuracy in spatial databases. *Computers, Environment and Urban Systems*, 17(2):103–110.

- [37] Cecconi, L., Grisotto, L., Catelan, D., Lagazio, C., Berrocal, V., and Biggeri, A. (2016). Preferential sampling and Bayesian geostatistics: Statistical modeling and examples. *Statistical Methods in Medical Research*, 25(4):1224–1243.
- [38] Chakraborty, A., Gelfand, A. E., Wilson, A. M., Latimer, A. M., and Silander, J. A. (2011). Point pattern modelling for degraded presence-only data over large regions. *Journal of the Royal Statistical Society: Series C (Applied Statistics)*, 60(5):757–776.
- [39] Chakraborty, A., Gelfand, A. E., Wilson, A. M., Latimer, A. M., and Silander Jr, J. A. (2010). Modeling large scale species abundance with latent spatial processes. *The Annals of Applied Statistics*, pages 1403–1429.
- [40] Claeskens, G. and Hjort, N. L. (2008). Model selection and model averaging. *Cambridge Books*.
- [41] Clark, J. S., Bell, D., Chu, C., Courbaud, B., Dietze, M., Hersh, M., HilleRis-Lambers, J., Ibáñez, I., LaDeau, S., McMahon, S., Metcalf, J., Mohan, J., Moran, E., Pangle, L., Pearson, S., Salk, C., Shen, Z., Valle, D., and Wyckoff, P. (2010). High-dimensional coexistence based on individual variation: a synthesis of evidence. *Ecological Monographs*, 80(4):569–608.
- [42] Clark, J. S., Macklin, E., and Wood, L. (1998). Stages and spatial scales of recruitment limitation in southern Appalachian forests. *Ecological Monographs*, 68(2):213–235.
- [43] Clark, J. S., Nemergut, D., Seyednasrollah, B., Turner, P. J., and Zhang, S. (2017). Generalized joint attribute modeling for biodiversity analysis: median-zero, multivariate, multifarious data. *Ecological Monographs*, 87(1):34–56.
- [44] Cressie, N. and Johannesson, G. (2008). Fixed rank kriging for very large spatial data sets. *Journal of the Royal Statistical Society: Series B (Statistical Methodology)*, 70(1):209–226.
- [45] Cressie, N. and Kornak, J. (2003). Spatial statistics in the presence of location error with an application to remote sensing of the environment. *Statistical Science*, pages 436–456.
- [46] Cressie, N. and Wikle, C. K. (2011). *Statistics for Spatio-Temporal Data*. John Wiley & Sons.
- [47] Cressie, N. A. (2005). *Statistics for spatial data*. Wiley Online Library, 2 edition.
- [48] Datta, A., Banerjee, S., Finley, A. O., and Gelfand, A. E. (2016). Hierarchical nearest-neighbor Gaussian process models for large geostatistical datasets. *Journal of the American Statistical Association*, 111:800–812.
- [49] Dempster, A. P., Laird, N. M., and Rubin, D. B. (1977). Maximum likelihood from incomplete data via the EM algorithm. *Journal of the Royal Statistical Society: Series B (Statistical Methodology)*, pages 1–38.
- [50] Dey, D. K., Gelfand, A. E., Swartz, T. B., and Vlachos, P. K. (1998). A simulation-intensive approach for checking hierarchical models. *Test*, 7(2):325–346.
- [51] Dierckx, P. (1995). *Curve and surface fitting with splines*. Oxford University Press.
- [52] Diggle, P., Menezes, R., and S, T. (2010). Geostatistical inference under preferential sampling. *Journal of the Royal Statistical Society: Series C (Applied Statistics)*, 59:191–232.
- [53] Diggle, P., Zheng, P., and Durr, P. (2005). Nonparametric estimation of spatial segregation in a multivariate point process: bovine tuberculosis in Cornwall, UK. *Journal of the Royal Statistical Society: Series C (Applied Statistics)*, 54(3):645–658.

- [54] Diggle, P. J. (2013). *Statistical analysis of spatial and spatio-temporal point patterns*. CRC Press, 3 edition.
- [55] Diggle, P. J., Eglen, S. J., and Troy, J. B. (2006). Modelling the bivariate spatial distribution of amacrine cells. In *Case Studies in Spatial Point Process Modeling*, pages 215–233. Springer.
- [56] Diggle, P. J., Tawn, J. A., and Moyeed, R. A. (1998). Model-based geostatistics. *Applied Statistics*, 47:299–350.
- [57] Dorazio, R. M. (2014). Accounting for imperfect detection and surver bias in statistical analysis of presence-only data. *Global Ecology and Biogeography*, 23:1472–1484.
- [58] Drovandi, C. C. and Pettitt, A. N. (2011). Estimation of parameters for macroparasite population evolution using approximate Bayesian computation. *Biometrics*, 67:225–233.
- [59] Efron, B. (2012). *Large-scale inference: empirical Bayes methods for estimation, testing, and prediction*, volume 1. Cambridge University Press.
- [60] Elith, J., Graham, C. H., Anderson, R. P., Dudík, M., Ferrier, S., Guisan, A., Hijmans, R. J., Huettmann, F., Leathwick, J. R., Lehmann, A., et al. (2006). Novel methods improve prediction of species’ distributions from occurrence data. *Ecography*, pages 129–151.
- [61] Enders, C. K. (2010). *Applied missing data analysis*. Guilford Press.
- [62] Engler, R., Guisan, A., and Rechsteiner, L. (2004). An improved approach for predicting the distribution of rare and endangered species from occurrence and pseudo-absence data. *Journal of Applied Ecology*, 41(2):263–274.
- [63] Epstein, E. S. (1969). A scoring system for probability forecasts of ranked categories. *Journal of Applied Meteorology*, 8(6):985–987.
- [64] Erhardt, R. J. and Smith, R. L. (2012). Approximate Bayesian computing for spatial extremes. *Computational Statistics and Data Analysis*, 56:1468–1481.
- [65] Fearnhead, P. and Prangle, D. (2012). Constructing summary statistics for approximate Bayesian computation: semi-automatic approximate Bayesian computation. *Journal of the Royal Statistical Society: Series B (Statistical Methodology)*, 74:419–474.
- [66] Feller, W. (2008). *An introduction to probability theory and its applications*. John Wiley & Sons, 2 edition.
- [67] Ferrier, S., Watson, G., Pearce, J., and Drielsma, M. (2002). Extended statistical approaches to modelling spatial pattern in biodiversity in northeast New South Wales. I. Species-level modelling. *Biodiversity & Conservation*, 11(12):2275–2307.
- [68] Finley, A., Sang, H., Banerjee, S., and Gelfand, A. E. (2009). Improving the performance of predictive process modeling for large datasets. *Computational Statistics and Data Analysis*, 53:2873–2884.
- [69] Fithian, W., Elith, J., Hastie, T., and Keith, D. A. (2015). Bias correction in species distribution models: pooling survey and collection data for multiple species. *Methods in Ecology and Evolution*, 6(4):424–438.
- [70] Fithian, W. and Hastie, T. (2013). Finite-sample equivalence in statistical models for presence-only data. *Annals of Applied Statistics*, 7:1917–1939.
- [71] Friedman, J., Hastie, T., and Tibshirani, R. (2010). Regularization paths for generalized linear models via coordinate descent. *Journal of Statistical Software*, 33:1–22.
- [72] Fuller, W. A. (1987). *Measurement error models*, volume 305. John Wiley & Sons.

- [73] Gelfand, A. E. and Ghosh, S. K. (1998). Model choice: a minimum posterior predictive loss approach. *Biometrika*, 85(1):1–11.
- [74] Gelfand, A. E., Schmidt, A. M., Banerjee, S., and Sirmans, C. (2004). Non-stationary multivariate process modeling through spatially varying coregionalization. *Test*, 13(2):263–312.
- [75] Gelfand, A. E., Schmidt, A. M., Wu, S., Silander, J. A., Latimer, A., and Rebelo, A. G. (2005). Modelling species diversity through species level hierarchical modelling. *Journal of the Royal Statistical Society: Series C (Applied Statistics)*, 54(1):1–20.
- [76] Gelfand, A. E., Silander, J. A., Wu, S., Latimer, A., Lewis, P. O., Rebelo, A. G., Holder, M., et al. (2006). Explaining species distribution patterns through hierarchical modeling. *Bayesian Analysis*, 1(1):41–92.
- [77] Gelman, A., Carlin, J. B., Stern, H. S., Dunson, D. B., Vehtari, A., and Rubin, D. B. (2014). *Bayesian Data Analysis*. CRC press Boca Raton, FL, 3 edition.
- [78] Gelman, A. and Meng, X.-L. (1998). Simulating normalizing constants: From importance sampling to bridge sampling to path sampling. *Statistical Science*, pages 163–185.
- [79] Gelman, A., Meng, X.-L., and Stern, H. (1996). Posterior predictive assessment of model fitness via realized discrepancies. *Statistica Sinica*, pages 733–760.
- [80] Georgii, H.-O. (1976). Canonical and grand canonical Gibbs states for continuum systems. *Communications in Mathematical Physics*, 48(1):31–51.
- [81] Geyer, C. J. and Møller, J. (1994). Simulation procedures and likelihood inference for spatial point processes. *Scandinavian Journal of Statistics*, pages 359–373.
- [82] Geyer, C. J. and Thompson, E. A. (1995). Annealing Markov chain Monte Carlo with applications to ancestral inference. *Journal of the American Statistical Association*, 90(431):909–920.
- [83] Giraud, C., Calenge, C., Coron, C., and Julliard, R. (2016). Capitalizing on opportunistic data for monitoring relative abundances of species. *Biometrics*, 72(2):649–658.
- [84] Girolami, M. and Calderhead, B. (2011). Riemann manifold Langevin and Hamiltonian Monte Carlo methods. *Journal of the Royal Statistical Society: Series B (Statistical Methodology)*, 73(2):123–214.
- [85] Gneiting, T. and Raftery, A. E. (2007). Strictly proper scoring rules, prediction, and estimation. *Journal of the American Statistical Association*, 102(477):359–378.
- [86] Goldstein, J., Haran, M., Simeonov, I., Fricks, J., and Chiaromonte, F. (2015). An attraction–repulsion point process model for respiratory syncytial virus infections. *Biometrics*, 71(2):376–385.
- [87] Gonçalves, F. B. and Gamerman, D. (2018). Exact Bayesian inference in spatiotemporal Cox processes driven by multivariate Gaussian processes. *Journal of the Royal Statistical Society: Series B (Statistical Methodology)*, 80(1):157–175.
- [88] Goulard, M., Särkkä, A., and Grabarnik, P. (1996). Parameter estimation for marked Gibbs point processes through the maximum pseudo-likelihood method. *Scandinavian Journal of Statistics*, 23:365–379.
- [89] Grabarnik, P. and Särkkä, A. (2009). Modelling the spatial structure of forest stands by multivariate point processes with hierarchical interactions. *Ecological Modelling*, 220(9-10):1232–1240.

- [90] Graham, C. H., Ferrier, S., Huettman, F., Moritz, C., and Peterson, A. T. (2004). New developments in museum-based informatics and applications in biodiversity analysis. *Trends in Ecology & Evolution*, 19(9):497–503.
- [91] Green, P. J. (1995). Reversible jump Markov chain Monte Carlo computation and Bayesian model determination. *Biometrika*, 82(4):711–732.
- [92] Guan, Y. (2006). A composite likelihood approach in fitting spatial point process models. *Journal of the American Statistical Association*, 101:1502–1512.
- [93] Guisan, A., Edwards Jr, T. C., and Hastie, T. (2002). Generalized linear and generalized additive models in studies of species distributions: setting the scene. *Ecological Modelling*, 157(2-3):89–100.
- [94] Guttorp, P. and Thorarinsdottir, T. L. (2012). Bayesian inference for non-Markovian point processes. In *Advances and Challenges in Space-time Modelling of Natural Events*, pages 79–102. Springer.
- [95] Häggström, O., Van Lieshout, M.-C. N., and Møller, J. (1999). Characterization results and Markov chain Monte Carlo algorithms including exact simulation for some spatial point processes. *Bernoulli*, 5(4):641–658.
- [96] Hastie, T. and Fithian, W. (2013). Inference from presence-only data; the ongoing controversy. *Ecography*, 36(8):864–867.
- [97] Higdon, D. (2002). Space and space-time modeling using process convolutions. In *Quantitative Methods for Current Environmental Issues*, pages 37–56. Springer.
- [98] Higgs, M. D. and Hoeting, J. A. (2010). A clipped latent variable model for spatially correlated ordered categorical data. *Computational Statistics & Data Analysis*, 54(8):1999–2011.
- [99] Högmander, H. and Särkkä, A. (1999). Multitype spatial point patterns with hierarchical interactions. *Biometrics*, 55(4):1051–1058.
- [100] Huang, F. and Ogata, Y. (1999). Improvements of the maximum pseudolikelihood estimators in various spatial statistical models. *Journal of Computational and Graphical Statistics*, 8:510–530.
- [101] Illian, J., Penttinen, A., Stoyan, H., and Stoyan, D. (2008). *Statistical analysis and modelling of spatial point patterns*, volume 70. John Wiley & Sons.
- [102] Illian, J. B., Martino, S., Sørbye, S. H., Gallego-Fernández, J. B., Zunzunegui, M., Esquivias, M. P., and Travis, J. M. (2013). Fitting complex ecological point process models with integrated nested Laplace approximation. *Methods in Ecology and Evolution*, 4(4):305–315.
- [103] Illian, J. B., Møller, J., and Waagepetersen, R. P. (2009). Hierarchical spatial point process analysis for a plant community with high biodiversity. *Environmental and Ecological Statistics*, 16(3):389–405.
- [104] Illian, J. B., Sørbye, S. H., and Rue, H. (2012). A toolbox for fitting complex spatial point process models using integrated nested Laplace approximation (INLA). *The Annals of Applied Statistics*, pages 1499–1530.
- [105] Jensen, J. L. and Møller, J. (1991). Pseudolikelihood for exponential family models of spatial point processes. *The Annals of Applied Probability*, pages 445–461.
- [106] Kelly, F. P. and Ripley, B. D. (1976). A note on Strauss’ model for clustering. *Biometrika*, 63:357–360.
- [107] Kelsall, J. E. and Diggle, P. J. (1995). Non-parametric estimation of spatial variation in relative risk. *Statistics in Medicine*, 14(21-22):2335–2342.
- [108] Kelsall, J. E. and Diggle, P. J. (1998). Spatial variation in risk of disease: a nonparametric binary regression approach. *Journal of the Royal Statistical Society: Series C (Applied Statistics)*, 47(4):559–573.

- [109] Kendall, W. S. (1998). Perfect simulation for the area-interaction point process. In *Probability Towards 2000*, pages 218–234. Springer.
- [110] Kendall, W. S. and Møller, J. (1999). *Perfect Metropolis-Hastings simulation of locally stable point processes*. University of Aarhus. Centre for Mathematical Physics and Stochastics (MaPhySto)[MPS].
- [111] Kendall, W. S. and Møller, J. (2000). Perfect simulation using dominating processes on ordered spaces, with application to locally stable point processes. *Advances in Applied Probability*, 32:844–865.
- [112] King, R., Illian, J. B., King, S. E., Nightingale, G. F., and Hendrichsen, D. K. (2012a). A Bayesian approach to fitting Gibbs processes with temporal random effects. *Journal of Agricultural, Biological, and Environmental Statistics*, 17(4):601–622.
- [113] King, R., Illian, J. B., King, S. E., Nightingale, G. F., and Hendrichsen, D. K. (2012b). A Bayesian approach to fitting Gibbs processes with temporal random effects. *Journal of Agricultural Biological and Environmental Statistics*, 17:601–622.
- [114] Kopecký, J. and Mrkvička, T. (2016). On the Bayesian estimation for the stationary Neyman-Scott point processes. *Applications of Mathematics*, 61(4):503–514.
- [115] Kottas, A. and Sansó, B. (2007). Bayesian mixture modeling for spatial Poisson process intensities, with applications to extreme value analysis. *Journal of Statistical Planning and Inference*, 137(10):3151–3163.
- [116] Kuo, H.-H. (2006). *Introduction to Stochastic Integration*. Springer.
- [117] Last, G. and Brandt, A. (1995). *Marked point processes on the real line: the dynamical approach*. Springer Science & Business Media.
- [118] Latimer, A. M., Wu, S., Gelfand, A. E., and Silander, J. A. (2006). Building statistical models to analyze species distributions. *Ecological Applications*, 16(1):33–50.
- [119] Lavancier, F., Møller, J., and Rubak, E. (2015). Determinantal point process models and statistical inference. *Journal of the Royal Statistical Society: Series B (Statistical Methodology)*, 77(4):853–877.
- [120] Lax, P. D. (2002). *Functional Analysis*. John Wiley & Sons.
- [121] Leininger, T. J. and Gelfand, A. E. (2017). Bayesian inference and model assessment for spatial point patterns using posterior predictive samples. *Bayesian Analysis*, 12(1):1–30.
- [122] Lewis, P. A. W. and Shedler, G. S. (1979). Simulation of a nonhomogeneous Poisson process by thinning. *Naval Logistics Quarterly*, 26:403–413.
- [123] Liang, S., Carlin, B. P., and Gelfand, A. E. (2009). Analysis of minnesota colon and rectum cancer point patterns with spatial and nonspatial covariate information. *The Annals of Applied Statistics*, 3(3):943–962.
- [124] Lim, K., Treitz, P., Wulder, M., St-Onge, B., and Flood, M. (2003). LiDAR remote sensing of forest structure. *Progress in Physical Geography*, 27(1):88–106.
- [125] Lindgren, F., Rue, H., and Lindström, J. (2011). An explicit link between Gaussian fields and Gaussian Markov random fields: the stochastic partial differential equation approach. *Journal of the Royal Statistical Society: Series B (Statistical Methodology)*, 73(4):423–498.
- [126] Liu, J. S. (2001). *Monte Carlo strategies in scientific computing*. Springer.
- [127] Lobo, J. M., Baselga, A., Hortal, J., Jiménez-Valverde, A., and Gómez, J. F. (2007). How does the knowledge about the spatial distribution of Iberian

- dung beetle species accumulate over time? *Diversity and Distributions*, 13(6):772–780.
- [128] Loisel, B. A., Jørgensen, P. M., Consiglio, T., Jiménez, I., Blake, J. G., Lohmann, L. G., and Montiel, O. M. (2008). Predicting species distributions from herbarium collections: does climate bias in collection sampling influence model outcomes? *Journal of Biogeography*, 35(1):105–116.
- [129] Lotwick, H. and Silverman, B. (1982). Methods for analysing spatial processes of several types of points. *Journal of the Royal Statistical Society: Series B (Statistical Methodology)*, pages 406–413.
- [130] Marin, J.-M., Pudlo, P., Robert, C. P., and Ryder, R. J. (2012). Approximate Bayesian computational methods. *Statistics and Computing*, 22:1167–1180.
- [131] Marinari, E. and Parisi, G. (1992). Simulated tempering: a new Monte Carlo scheme. *Europhysics Letters*, 19(6):451.
- [132] Marjoram, P., Molitor, J., Plagnol, V., and Tavaré, S. (2003). Markov chain Monte Carlo without likelihoods. *Proceedings of the National Academy of Sciences*, 100:15324–15328.
- [133] Mase, S., Møller, J., Stoyan, D., Waagepetersen, R. P., and Döge, G. (2001). Packing densities and simulated tempering for hard core Gibbs point processes. *Annals of the Institute of Statistical Mathematics*, 53(4):661–680.
- [134] Mattfeldt, T., Eckel, S., Fleischer, F., and Schmidt, V. (2007). Statistical modelling of the geometry of planar sections of prostatic capillaries on the basis of stationary Strauss hard-core processes. *Journal of Microscopy*, 228:272–81.
- [135] McKean, H. P. (1969). *Stochastic integrals*, volume 353. American Mathematical Society.
- [136] McLachlan, G. and Peel, D. (2004). *Finite mixture models*. John Wiley & Sons.
- [137] Møller, J. (1999). Perfect simulation of conditionally specified models. *Journal of the Royal Statistical Society: Series B (Statistical Methodology)*, 61(1):251–264.
- [138] Møller, J. (2001). A review of perfect simulation in stochastic geometry. *Lecture Notes-Monograph Series*, pages 333–355.
- [139] Møller, J. (2012). Aspects of spatial point process modelling and Bayesian inference. *Presentation at Bayes Lectures 2012, Edinburgh, UK*.
- [140] Møller, J., Pettitt, A. N., Reeves, R., and Berthelsen, K. K. (2006). An efficient Markov chain Monte Carlo method for distributions with intractable normalising constants. *Biometrika*, 93(2):451–458.
- [141] Møller, J., Syversveen, A. R., and Waagepetersen, R. P. (1998). Log gaussian cox processes. *Scandinavian Journal of Statistics*, 25(3):451–482.
- [142] Møller, J. and Waagepetersen, R. P. (2003). *Statistical inference and simulation for spatial point processes*. CRC Press.
- [143] Møller, J. and Waagepetersen, R. P. (2007). Modern statistics for spatial point processes. *Scandinavian Journal of Statistics*, 34(4):643–684.
- [144] Murray, I., Adams, R. P., and MacKay, D. J. (2010). Elliptical slice sampling. *Journal of Machine Learning Research: Workshop and Conference Proceedings (AISTATS)*, 9:541–548.
- [145] Murray, I., Ghahramani, Z., and MacKay, D. J. C. (2006). MCMC for doubly-intractable distributions. In *Proceedings of the 22nd Annual Conference on Uncertainty in Artificial Intelligence (UAI)*. AUAI Press.
- [146] Neal, R. M. (1993a). Bayesian learning via stochastic dynamics. In *Advances in neural information processing systems*, pages 475–482.

- [147] Neal, R. M. (1993b). Probabilistic inference using Markov chain Monte Carlo methods. Technical report, Department of Computer Science, University of Toronto Toronto, Ontario, Canada.
- [148] Neal, R. M. (1996). *Bayesian learning for neural networks*, volume 118. Springer.
- [149] Newbold, T., Gilbert, F., Zalat, S., El-Gabbas, A., and Reader, T. (2009). Climate-based models of spatial patterns of species richness in Egypt's butterfly and mammal fauna. *Journal of Biogeography*, 36(11):2085–2095.
- [150] Nychka, D. and Anderson, J. L. (2010). Data assimilation. In *Handbook of spatial statistics*, pages 477–493. CRC Press.
- [151] Nychka, D. and Saltzman, N. (1998). Design of air-quality monitoring networks. In *Case studies in environmental statistics*, pages 51–76. Springer.
- [152] Øksendal, B. (2003). *Stochastic Differential Equations*. Springer, 6 edition.
- [153] Ovaskainen, O., Roy, D. B., Fox, R., and Anderson, B. J. (2016). Uncovering hidden spatial structure in species communities with spatially explicit joint species distribution models. *Methods in Ecology and Evolution*, 7(4):428–436.
- [154] Ovaskainen, O. and Soininen, J. (2011). Making more out of sparse data: hierarchical modeling of species communities. *Ecology*, 92(2):289–295.
- [155] Pacifici, K., Reich, B. J., Miller, D. A., Gardner, B., Stauffer, G., Singh, S., McKerrow, A., and Collazo, J. A. (2017). Integrating multiple data sources in species distribution modeling: A framework for data fusion. *Ecology*, 98(3):840–850.
- [156] Pati, D., Reich, B. J., and Dunson, D. B. (2011). Bayesian geostatistical modelling with informative sampling locations. *Biometrika*, 98:35–48.
- [157] Pearce, J. L. and Boyce, M. S. (2006). Modelling distribution and abundance with presence-only data. *Journal of Applied Ecology*, 43:405–412.
- [158] Peterson, A. T. and Kluza, D. A. (2003). New distributional modelling approaches for gap analysis. *Animal Conservation*, 6(1):47–54.
- [159] Phillips, S. J., Anderson, R. P., and Schapire, R. E. (2006). Maximum entropy modeling of species geographic distributions. *Ecological Modelling*, 190:231–259.
- [160] Phillips, S. J., Dudík, M., Elith, J., Graham, C. H., Lehmann, A., Leathwick, J., and Ferrier, S. (2009). Sample selection bias and presence-only distribution models: implications for background and pseudo-absence data. *Ecological Applications*, 19(1):181–197.
- [161] Picchini, U. (2013). Inference for SDE models via approximate Bayesian computation. *Journal of Computational and Graphical Statistics*, 23:1080–1100.
- [162] Pritchard, J., Seielstad, M., Perez-Lezaun, A., and Feldman, M. (1999). Population growth of human Y chromosomes: a study of Y chromosome microsatellites. *Molecular Biology and Evolution*, 16:1791–1798.
- [163] Propp, J. G. and Wilson, D. B. (1996). Exact sampling with coupled Markov chains and applications to statistical mechanics. *Random Structures and Algorithms*, 9(1-2):223–252.
- [164] Propp, J. G. and Wilson, D. B. (1998). How to get a perfectly random sample from a generic Markov chain and generate a random spanning tree of a directed graph. *Journal of Algorithms*, 27(2):170–217.
- [165] Rathbun, S. L. and Cressie, N. (1994). Asymptotic properties of estimators for the parameters of spatial inhomogeneous Poisson point processes. *Advances in Applied Probability*, 26(1):122–154.
- [166] Reese, G. C., Wilson, K. R., Hoeting, J. A., and Flather, C. H. (2005).

- Factors affecting species distribution predictions: a simulation modeling experiment. *Ecological Applications*, 15(2):554–564.
- [167] Renner, I. W., Elith, J., Baddeley, A., Fithian, W., Hastie, T., Phillips, S. J., Popovic, G., and Warton, D. I. (2015). Point process models for presence-only analysis. *Methods in Ecology and Evolution*, 6(4):366–379.
- [168] Ripley, B. D. (1977). Modelling spatial patterns. *Journal of the Royal Statistical Society. Series B (Methodological)*, pages 172–212.
- [169] Ripley, B. D. (1981). *Spatial statistics*. John Wiley & Sons.
- [170] Roberts, G. O. and Rosenthal, J. S. (1998a). Markov-chain Monte Carlo: Some practical implications of theoretical results. *Canadian Journal of Statistics*, 26(1):5–20.
- [171] Roberts, G. O. and Rosenthal, J. S. (1998b). Optimal scaling of discrete approximations to Langevin diffusions. *Journal of the Royal Statistical Society: Series B (Statistical Methodology)*, 60(1):255–268.
- [172] Roberts, G. O. and Rosenthal, J. S. (2007). Coupling and ergodicity of adaptive Markov chain Monte Carlo algorithms. *Journal of Applied Probability*, 44(2):458–475.
- [173] Roberts, G. O., Rosenthal, J. S., et al. (2001). Optimal scaling for various Metropolis-Hastings algorithms. *Statistical Science*, 16(4):351–367.
- [174] Roberts, G. O. and Stramer, O. (2002). Langevin diffusions and Metropolis-Hastings algorithms. *Methodology and computing in applied probability*, 4(4):337–357.
- [175] Royle, J. A., Chandler, R. B., Yackulic, C., and Nichols, J. D. (2012). Likelihood analysis of species occurrence probability from presence-only data for modelling species distributions. *Methods in Ecology and Evolution*, 3(3):545–554.
- [176] Rue, H., Martino, S., and Chopin, N. (2009). Approximate Bayesian inference for latent Gaussian models by using integrated nested Laplace approximations. *Journal of the Royal Statistical Society: Series B (Statistical Methodology)*, 71(2):319–392.
- [177] Rundel, C. W., Schliep, E. M., Gelfand, A. E., and Holland, D. M. (2015). A data fusion approach for spatial analysis of speciated PM_{2.5} across time. *Environmetrics*, 26(8):515–525.
- [178] Sahu, S. K., Gelfand, A. E., and Holland, D. M. (2010). Fusing point and areal level space–time data with application to wet deposition. *Journal of the Royal Statistical Society: Series C (Applied Statistics)*, 59(1):77–103.
- [179] Särkkä, A. (1995). Pseudo-likelihood approach for Gibbs point processes in connection with field observations. *Statistics: A Journal of Theoretical and Applied Statistics*, 26(1):89–97.
- [180] Schliep, E., Gelfand, A., and Holland, D. (2015). Autoregressive spatially varying coefficients model for predicting daily PM_{2.5} using VIIRS satellite AOT. *Advances in Statistical Climatology, Meteorology and Oceanography*, 1(1):59.
- [181] Schliep, E. M., Dong, T. Q., Gelfand, A. E., and Li, F. (2014). Modeling individual tree growth by fusing diameter tape and increment core data. *Environmetrics*, 25(8):610–620.
- [182] Schliep, E. M., Lany, N. K., Zarnetske, P. L., Schaeffer, R. N., Orians, C. M., Orwig, D. A., and Preisser, E. L. (2018). Joint species distribution modelling for spatio-temporal occurrence and ordinal abundance data. *Global Ecology and Biogeography*, 27(1):142–155.

- [183] Shimatani, K. (2001). Multivariate point processes and spatial variation of species diversity. *Forest Ecology and Management*, 142(1-3):215–229.
- [184] Shirota, S. and Gelfand, A. E. (2017). Approximate Bayesian computation and model assessment for repulsive spatial point processes. *Journal of Computational and Graphical Statistics*, 26(3):646–657.
- [185] Silverman, B. W. (2018). *Density estimation for statistics and data analysis*. Chapman & Hall/CRC.
- [186] Simpson, D., Illian, J. B., Lindgren, F., Sørbye, S. H., and Rue, H. (2016). Going off grid: Computationally efficient inference for log-Gaussian Cox processes. *Biometrika*, 103(1):49–70.
- [187] Sisson, S. A. and Fan, Y. (2011). Likelihood-free Markov chain Monte Carlo. In *Handbook of Markov Chain Monte Carlo*, pages 313–338. Chapman and Hall/CRC.
- [188] Soubeyrand, S., Carpentier, F., Guiton, F., and Klein, E. K. (2013). Approximate Bayesian computation with functional statistics. *Statistical Applications in Genetics and Molecular Biology*, 12(1):17–37.
- [189] Stein, M. L. (1999). *Interpolation of spatial data: some theory for kriging*. Springer Science & Business Media.
- [190] Stein, M. L., Chi, Z., and Welty, L. J. (2004). Approximating likelihoods for large spatial data sets. *Journal of the Royal Statistical Society: Series B (Statistical Methodology)*, 66(2):275–296.
- [191] Stoyan, D. and Grabarnik, P. (1991). Second-order characteristics for stochastic structures connected with Gibbs point processes. *Mathematische Nachrichten*, 151(1):95–100.
- [192] Stoyan, D. and Penttinen, A. (2000). Recent applications of point process methods in forestry statistics. *Statistical Science*, 15:61–78.
- [193] Strauss, D. J. (1975). A model for clustering. *Biometrika*, 62:467–475.
- [194] Taddy, M. A. (2010). Autoregressive mixture models for dynamic spatial Poisson processes: Application to tracking intensity of violent crime. *Journal of the American Statistical Association*, 105(492):1403–1417.
- [195] Taddy, M. A. and Kottas, A. (2012). Mixture modeling for marked Poisson processes. *Bayesian Analysis*, 7(2):335–362.
- [196] Taylor, B. M. and Diggle, P. J. (2014). INLA or MCMC? a tutorial and comparative evaluation for spatial prediction in log-Gaussian Cox processes. *Journal of Statistical Computation and Simulation*, 84(10):2266–2284.
- [197] Thapa, K. and Bossler, J. (1992). Accuracy of spatial data used information systems. *Photogrammetric Engineering & Remote Sensing*, 58(6):835–841.
- [198] Tibshirani, R. (1996). Regression shrinkage and selection via the lasso. *Journal of the Royal Statistical Society: Series B (Statistical Methodology)*, 58:267–288.
- [199] Tierney, L., Kass, R. E., and Kadane, J. B. (1989). Fully exponential Laplace approximations to expectations and variances of nonpositive functions. *Journal of the American Statistical Association*, 84(407):710–716.
- [200] Titterton, D. M., Smith, A. F., and Makov, U. E. (1985). *Statistical analysis of finite mixture distributions*. Wiley.
- [201] Tyre, A. J., Tenhumberg, B., Field, S. A., Niejalke, D., Parris, K., and Possingham, H. P. (2003). Improving precision and reducing bias in biological surveys: Estimating false-negative error rates. *Ecological Applications*, 13(6):1790–1801.
- [202] Van Lieshout, M. and Baddeley, A. J. (2001). Extrapolating and interpolat-

- ing spatial patterns. In *In Spatial Cluster Modelling*. Citeseer, Chapman & Hall/CRC.
- [203] Velázquez, E., Martínez, I., Getzin, S., Moloney, K. A., and Wiegand, T. (2016). An evaluation of the state of spatial point pattern analysis in ecology. *Ecography*, 39(11):1042–1055.
- [204] Veloz, S. D. (2009). Spatially autocorrelated sampling falsely inflates measures of accuracy for presence-only niche models. *Journal of Biogeography*, 36(12):2290–2299.
- [205] Ver Hoef, J. M., Cressie, N., Fisher, R. N., and Case, T. J. (2001). Uncertainty and spatial linear models for ecological data. In *Spatial Uncertainty in Ecology*, pages 214–237. Springer.
- [206] Waagepetersen, R. (2004). Convergence of posteriors for discretized log Gaussian Cox processes. *Statistics & Probability Letters*, 66(3):229–235.
- [207] Waagepetersen, R., Guan, Y., Jalilian, A., and Mateu, J. (2016). Analysis of multispecies point patterns by using multivariate log-Gaussian Cox processes. *Journal of the Royal Statistical Society: Series C (Applied Statistics)*, 65(1):77–96.
- [208] Waagepetersen, R. and Schweder, T. (2006). Likelihood-based inference for clustered line transect data. *Journal of Agricultural, Biological, and Environmental Statistics*, 11(3):264.
- [209] Wakefield, J. and Lyons, H. (2010). Spatial aggregation and the ecological fallacy. In *Handbook of spatial statistics*, pages 541–558. CRC Press.
- [210] Wakefield, J. and Shaddick, G. (2006). Health-exposure modeling and the ecological fallacy. *Biostatistics*, 7(3):438–455.
- [211] Ward, G., Hastie, T., Barry, S., Elith, J., and Leathwick, J. (2009). Presence-only data and the EM algorithm. *Biometrics*, 65:554–563.
- [212] Warton, D. I. and Shepherd, L. C. (2010). Poisson point process models solve the pseudo-absence problem for presence-only data in ecology. *Annals of Applied Statistics*, 4:1383–1402.
- [213] West, M. and Harrison, J. (1997). *Bayesian Forecasting and Dynamic Models*. Springer, 2 edition.
- [214] Wikle, C. K. and Berliner, L. M. (2007). A Bayesian tutorial for data assimilation. *Physica D: Nonlinear Phenomena*, 230(1-2):1–16.
- [215] Wikle, C. K., Milliff, R. F., Nychka, D., and Berliner, L. M. (2001). Spatiotemporal hierarchical Bayesian modeling tropical ocean surface winds. *Journal of the American Statistical Association*, 96(454):382–397.
- [216] Wisz, M. S., Hijmans, R., Li, J., Peterson, A. T., Graham, C., Guisan, A., and Group, N. P. S. D. W. (2008). Effects of sample size on the performance of species distribution models. *Diversity and Distributions*, 14(5):763–773.
- [217] Wolpert, R. L. and Ickstadt, K. (1998). Poisson/gamma random field models for spatial statistics. *Biometrika*, 85(2):251–267.
- [218] Xanh, N. X. and Zessin, H. (1979). Integral and differential characterizations of the Gibbs process. *Mathematische Nachrichten*, 88(1):105–115.
- [219] Xiao, S., Kottas, A., and Sansó, B. (2015). Modeling for seasonal marked point processes: An analysis of evolving hurricane occurrences. *The Annals of Applied Statistics*, 9(1):353–382.
- [220] Zhou, Z., Matteson, D. S., Woodard, D. B., Henderson, S. G., and Micheas, A. C. (2015). A spatio-temporal point process model for ambulance demand. *Journal of the American Statistical Association*, 110(509):6–15.