Stat 534 Project: Point Process Intensity Surface Models

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1 Introduction

unobserved point processes – only observe events in subregions selected by practitioner but want to make inference about inhomogeneous intensity over entire region

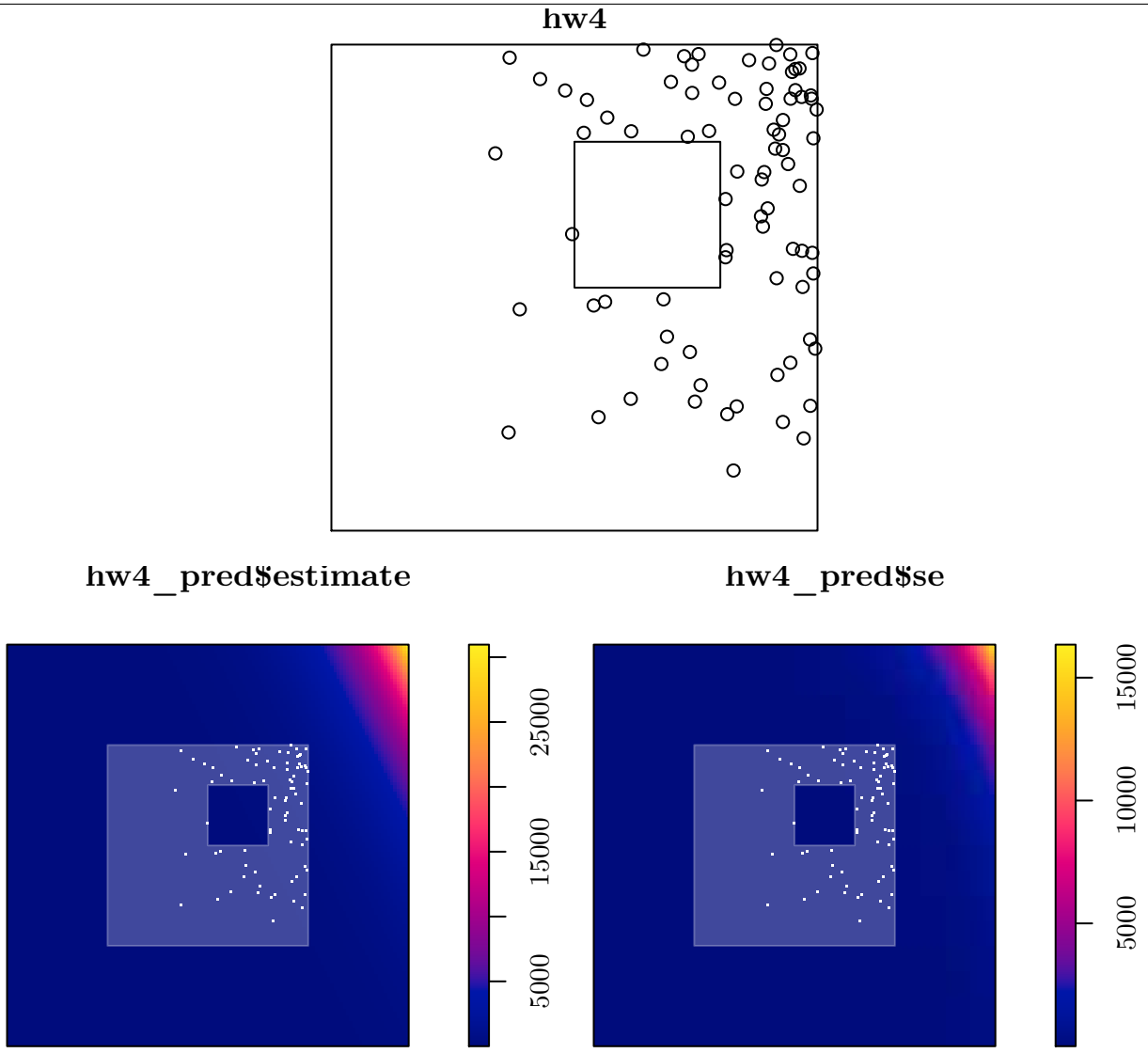
know something is in the vicinity but want to know where specifically – examples: endangered clustered plant species in underbrush of thick forest, conservationists want to know where the clusters are; subsurface geomagnetic anomalies that could be unexploded ordnance – concerned with mapping the intensity of this realization, not estimating parameters of the process

2 Surface Fitting

Baddeley and Turner (2000), Baddeley et al. (2014), Berman and Turner (1992), Diggle (2013), Diggle et al. (1994), and Flagg (2016)

3 Simple Examples

loglinear example from HW4



easy site, realization 2,000, 390 ft spacing

4 Simulation Study

5 Discussion and Conclusion

A R Code Appendix

References

Baddeley, Adrian and Rolf Turner (2000). "Practical maximum pseudolikelihood for spatial point patterns". In: *Australian & New Zealand Journal of Statistics* 42.3, pp. 283–322.

Baddeley, Adrian et al. (2014). "Logistic regression for spatial Gibbs point processes". In: *Biometrika* 101.2, pp. 377–392.

Berman, Mark and Rolf Turner (1992). "Approximating point process likelihoods with GLIM". In: *Applied Statistics*, pp. 31–38.

Diggle, Peter J. (2013). *Statistical Analysis of Spatial and Spatio-Temporal Point Patterns*. 3rd ed. CRC Press.

Diggle, Peter J et al. (1994). "On parameter estimation for pairwise interaction point processes". In: *International Statistical Review/Revue Internationale de Statistique*, pp. 99–117.

Flagg, KA (2016). "Visual Sample Plan and Unexploded Ordnance: What do we need to know to find UXO?" M.S. writing project. Montana State University, Bozeman. URL: `https://github.com/kflagg/vspuxo`.