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A maximum likelihood method for encounters of unmarked animals at points

Starting with Chandler and Royle (2013), there has been a proliferation of Bayesian inference methods for spatially explicit detection data for partially-marked or unmarked populations. These models involve latent activity centres that are modelled as arising from a spatial point process. Frequentist inference from such data has been hampered by the lack of a tractable likelihood function that marginalises out the latent activity centres. In this talk I develop a tractable likelihood, illustrate its use on simulated and real data, for both the case in which there are some marked individuals in the population and the case in which there are only observations of unmarked individuals. I also discuss some strengths and weaknesses of this kind of inference.