

Spatial point process models of defensive strategies: Detecting changes

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Abstract

The study of stochastic processes can take many forms. Theoretical properties are important to ensure consistent model definition. Statistical inference on unknown parameters is equally important but can be difficult. This is principally because many of the standard assumptions for proving consistency and asymptotic normality of estimators involve independence and homogeneity. In the case where inference is concerned with detecting change in a spatial process from one time point to another, a statistical-computing approach can be rewarding. Regardless of the complexity of the stochastic process, if simulating from it is relatively easy, then detecting change is possible using a Monte Carlo approach. The methodology is applied in a military scenario, where a country's defensive posture changes as a function of its perceived threat. For tactical-decision purposes, it is extremely important to know whether the country's perceived threat level has changed.