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A J -function for marked point patterns

Received: 5 July 2004 / Revised: 7 February 2005 / Published online: 30 May 2006
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Abstract We propose a new summary statistic for marked point patterns. The underlying principle is to compare the distance from a marked point to the nearest other marked point in the pattern to the same distance seen from an arbitrary point in space. Information about the range of interaction can be inferred, and the statistic is well-behaved under random mark allocation. We develop a range of Hanisch style kernel estimators to tackle the problems of exploding tail variance earlier associated with J -function plug-in estimators, and carry out an exploratory analysis of a forestry data set.

Keywords Empty space function · J -function · Marked point pattern · Mark correlation function · Nearest neighbour distance distribution function · Product density · Random labelling · Reduced second moment measure · Spatial interaction · Spatial statistics