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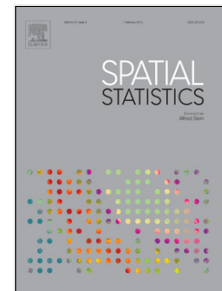
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# Distance to the Border in Spatial Point Patterns

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## Abstract

The analysis of spatial point patterns is commonly focused on the distances to the nearest neighbor. The distance of organisms to the edge of the enclosure is also of interest in some biological studies performed in the laboratory. We define the  $B$  (border) function and derive its shape assuming complete spatial randomness (CSR) for square, rectangular, circular, and some three-dimensional arenas. The idea is then extended outside the laboratory setting to work with maps and points located in geographical regions. Commands in R ([1]) to calculate and plot the empirical  $\hat{B}$  function are included. The  $B$  function, based on distances to the nearest edge, in addition to the  $G$  function, based on distances to the nearest neighbor, contributes to the understanding of the spatial distribution of the points.

*Keywords:* distance to nearest edge, nearest neighbor, maps, experimental enclosures

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## 1. Introduction

Statistical methods to analyze spatial point patterns are used in several fields such as ecology, public health, and biology. In the analysis of spatial point patterns, the distances from each point to its nearest neighbor receives

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