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Abstract



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Limit behaviour of the coverage threshold

Let X_1, X_2, \dots be i.i.d. random uniform points in a bounded domain $A \subset \mathbb{R}^d$. Define the *coverage threshold* R_n to be the smallest r such that A is covered by the balls of radius r centred on X_1, \dots, X_n . Clearly R_n is random, and nonincreasing in n . We discuss the limiting behaviour of R_n as $n \rightarrow \infty$, including:

- limiting distribution when A is polygonal or polyhedral;
- strong laws of large numbers when A has a smooth boundary;
- limiting behaviour for the number of record times in the sequence (R_n) , i.e. instances when $R_n < R_{n-1}$.

The analysis relies on classical results by Hall and by Janson, along with a careful treatment of boundary effects. For some of our results, we can relax the requirement that the underlying density on A be uniform.