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Binary Plane Partitions for Disjoint Line Segments

A binary space partition (BSP) for a set of disjoint objects in Euclidean space is a recursive decomposition of the space, where each step partitions the space (and some of the objects) along a hyperplane and recurses on the objects clipped in each of the two open halfspaces. The size of a BSP is defined as the number of resulting fragments of the input objects. It is shown that every set of n disjoint line segments in the plane admits a BSP of size $O(n \log n / \log \log n)$. This bound is best possible apart from the constant factor.