On Showing Lower Bounds for External Memory Computational Geometry Problems

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Abstract

In this paper we consider lower bounds for external-memory computational geometry problems. We find that it is not quite clear which model of computation to use when considering such problems. As an attempt of providing a model, we define the external memory Turing machine model, and we derive lower bounds for a number of problems, including the element distinctness problem, in this model. For these lower bounds we make the standard assumption that records are indivisible. Waiving the indivisibility assumption we show how to beat the lower bound for element distinctness.