Atallah, Mikhail J.; Tsay, Jyh-Jong
On the parallel-decomposability of geometric problems. (English) Zbl 0748.68079

Summary: There is a large and growing body of literature concerning the solutions of geometric problems on mesh-connected arrays of processors. Most of these algorithms are optimal (i.e., run in time $O(n^{1/d})$ on a $d$-dimensional $n$-processor array), and they all assume that the parallel machine is trying to solve a problem of size $n$ on an $n$-processor array. Here we investigate the situation where we have a mesh of size $p$ and we are interested in using it to solve a problem of size $n > p$. The goal we seek is to achieve, when solving a problem of size $n > p$, the same speed up as when solving a problem of size $p$. We show that for many geometric problems, the same speedup can be achieved when solving a problem of size $n > p$ as when solving a problem of size $p$.

MSC:
68U05 Computer graphics; computational geometry (digital and algorithmic aspects)
68W15 Distributed algorithms

Keywords:
mesh-connected arrays of processors

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References:


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