

1096-68-1478

Eunhui Park* (eunhuipark@gmail.com), 6200 Westchester Park Dr. Apt 1502, College Park, MD 20740, and **David Mount**, College Park, MD 20740. *Output-Sensitive Well-Separated Pair Decompositions for Dynamic Point Sets.*

The well-separated pair decomposition (WSPD) is a fundamental structure in computational geometry. Given a set of n points in d -dimensional space and a positive parameter s , it is known that there exists an s -WSPD of size $O(s^d n)$. While this is linear in n , the factor of s^d is a significant consideration when the dimension d is even a moderately large constant. The actual number of pairs may be much smaller than this worst-case bound, for example, if the points are clustered near a lower dimensional subspace. Batch WSPD constructions are output sensitive, but existing algorithms for maintaining the WSPD of a dynamic point set are not. In this paper we present output-sensitive algorithms for maintaining the WSPD of a dynamic point set under insertion and deletion. (Received September 15, 2013)