On the Dynamic One-dimensional Interval Management Problem in External Memory

Mircea Adam

Department of Mathematics and Computer Science
University of Bucharest
Academiei 14, Bucharest, Romania
e-mail: madam@math.math.unibuc.ro

Abstract

The external interval tree is a space and I/O-optimal external memory data structure for answering stabbing queries on a set of dynamically maintained intervals. In this paper we present a variant of this structure based on the weight-balanced *B*-tree, an externalization of the *BB[α]*-tree, developed by L.Arge and J.S.Vitter, whose nodes are augmented with secondary structures for storing the intervals as points in the two-dimensional space. With this structure we obtain the same worst-case optimal bounds as in [1], but with a different more compact implementation.

Keywords: dynamic interval management, stabbing query, 2-dimensional range searching, weight-balanced *B*-tree, interval tree, indexing.