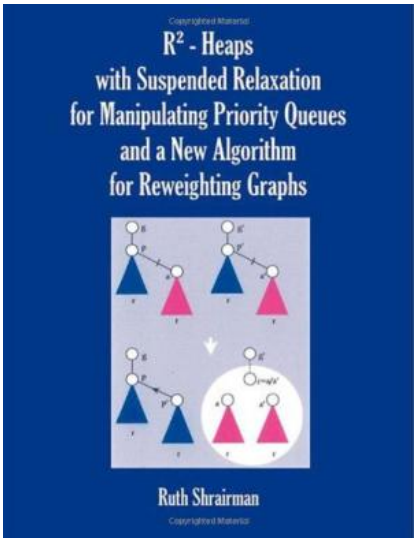

R - Heaps with Suspended Relaxation for Manipulating Priority Queues and a New Algorithm for Reweighting Graphs (Paperback)

By Ruth Shrairman

DISSERTATION.COM, United States, 2004. Paperback. Book Condition: New. 244 x 186 mm. Language: English Brand New Book ***** Print on Demand *****.This research is dedicated to two main problems in finding shortest paths in the graphs. The first problem is to find shortest paths from an origin to all other vertices in non-negatively weighted graph. The second problem is the same, except it is allowed that some edges are negative. This is a more difficult problem that can be solved by relatively complicated algorithms. We attack the first problem by introducing a new data structure - Relaxed Heaps that implements efficiently two main operations critical for the improvement of Dijkstra s shortest path algorithm. R2-heaps with suspended relaxation proposed in this research gives the best known worst-case time bounds of O(1) for a decrease key operation and O(logn) for a delete min operation. That results in the best worst-case running time for Dijkstra s algorithm O(m+nlogn), and represents an improvement over Fibonacci Heaps, which give the same, but amortized time bounds. The new data structure is simple and efficient in practical implementation. The empirical study with R2-heaps demonstrated strong advantage of its use for Dijkstra s algorithm over the raw...

Reviews

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