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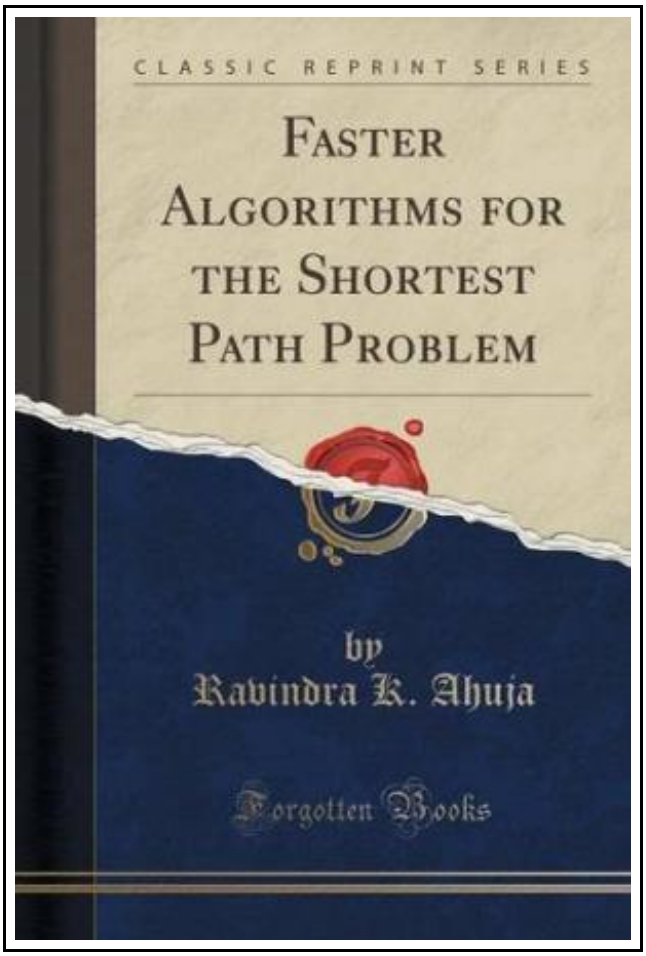

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Reviews

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(Eulalia Schamberger)

FASTER ALGORITHMS FOR THE SHORTEST PATH PROBLEM (CLASSIC REPRINT) (PAPERBACK)

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Forgotten Books, United States, 2015. Paperback. Book Condition: New. 229 x 152 mm. Language: English . Brand New Book ***** Print on Demand *****.Excerpt from Faster Algorithms for the Shortest Path Problem In this paper, we present the fastest known algorithms for the shortest path problem with nonnegative integer arc lengths We consider networks with n nodes and m arcs and in which C represents the largest arc length in the network. Our algorithms are obtained by implementing Dijkstra s algorithm using a new data structure which we call a redistributive heap The one-level redistributive heap consists of O(log C) buckets, each with an associated range of integer numbers Each bucket stores nodes whose temporary distance labels lie in its range Further, the ranges are dynamically changed during the execution, which leads to a redistribution of nodes to buckets. The resulting algorithm runs in O(m] n log C) time. Using a two-level redistributive heap, we improve the complexity of this algorithm to O(m + n log C/ log log nC). Finally, we use a modified version of Fibonacci heaps to reduce the complexity of our algorithm to O(m + n log C). This algorithm, under the assumption that the largest arc length is bounded by a polynomial function of n, runs in O(m + n log n) time, which improves over the best previous strongly polynomial bound of O(m + n log n) due to Fredman and Tarjan. We also analyse our algorithms in the semi-logarithmic model of computation. In this model, it takes [log x/log n] time to perform arithmetic on integers of value x. It is shown that in this model of computation, some of our algorithms run in linear time for sufficiently large values of C. About the Publisher Forgotten Books publishes hundreds of...

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