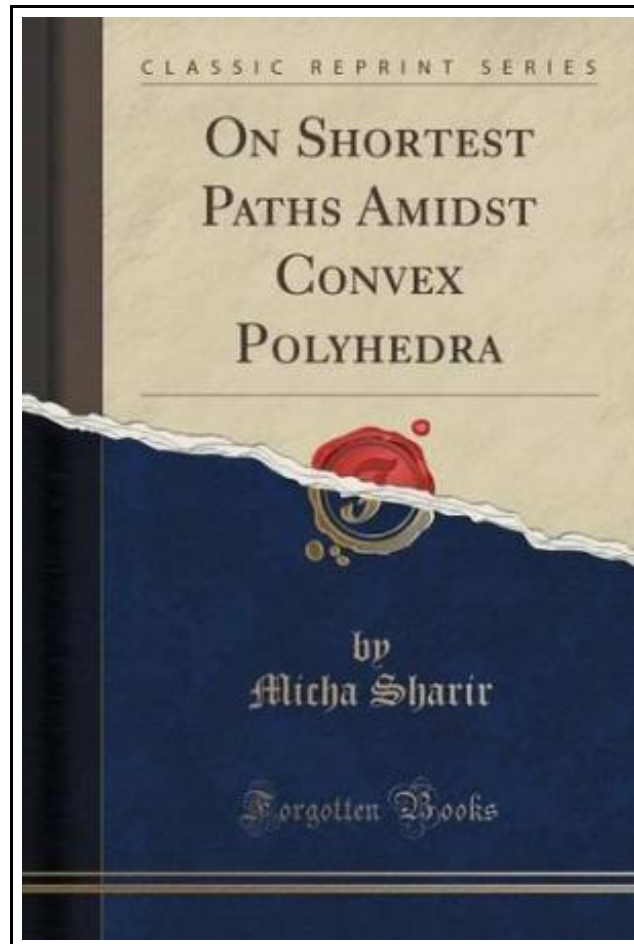# On Shortest Paths Amidst Convex Polyhedra (Classic Reprint)

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Reviews

This pdf is indeed gripping and interesting. It is definitely simplistic but shocks within the 50 percent of your book. Once you begin to read the book, it is extremely difficult to leave it before concluding. (Michael Spinka)

ON SHORTEST PATHS AMIDST CONVEX POLYHEDRA (CLASSIC REPRINT)

Forgotten Books, United States, 2015. Paperback. Book Condition: New. 229 x 152 mm. Language: English . Brand New Book ***** Print on Demand *****.Excerpt from On Shortest Paths Amidst Convex Polyhedra Let K be a 3-D convex polyhedron having n vertices. A sequence of edges of K is called a shortest-path sequence if there exist two points X, Y on the surface S of K such that is the sequence of edges crossed by the shortest path from X to Y along S. We show that the number of shortest-path sequences for K is polynomial inn, and as a consequence prove that the shortest path between two points in 3-space which must avoid the interiors of a fixed number of disjoint convex polyhedral obstacles, can be calculated in time polynomial in the total number of vertices of these obstacles (but exponential in the number of obstacles). 1. Introduction In this paper we study several problems related to the problem of calculating the Euclidean shortest path between two points in 3-dimensional space, which must avoid the interiors of a collection of polyhedral obstacles having altogether n vertices. This general problem seems to be intractable, and the only known algorithms for it require exponential time ([SS], [RS]), although no lower bounds are known as yet for this problem. On the other extreme hand we have the problem of finding the shortest path between two points in 3-space which must avoid the interior of a single convex polyhedral obstacle. In this case the problem is solvable in time 0(n log n) ([SS], [Mo]). Interpolating between these two extreme cases, one might consider the problem in which the polyhedral obstacles consist of a fixed number k of disjoint convex polyhedra (having altogether n vertices), and attempt to calibrate the complexity of this problem as...

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