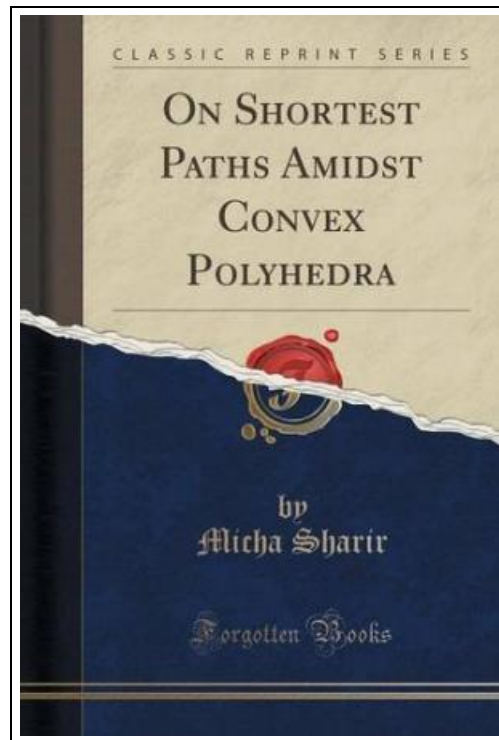


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1. Introduction In this paper we study several problems related to the problem of calculating the Euclidean shortest path between two points in 3-dimensional space, which must avoid the interiors of a collection of polyhedral obstacles having altogether 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 $O(n \log n)$ ([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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