A new algorithm for computing minimum distance

Abstract

This paper presents a new algorithm for computing the minimum distance between convex polyhedras. The algorithm of Gilbert-Johnson-Keerthi (GJK) and the algorithm of Lin-Canny (LC) are well-known fast solutions to the problem. We show how a mix between LC's idea and the GJK's algorithm can be used to solve the problem. In our algorithm, we use local methods to calculate the distance between features and new "updating" conditions to add stability. These new conditions enable one to ensure more stability when compared to GJK. We also modify our terminating conditions to add robustness to our approach. Our experiments also show that the expected running time of our approach is constant, independent of the complexity of the polyhedra. We present some comparisons of our method with GJK.