An Algorithm For Computing The Distance Between Two Circular Disks

Almohamad, HA; Selim, SZ

Summary

This paper presents an algorithm for computing the distance between two circular disks in three-dimensional space. A Kurush-Kuhn-Tucker (KKT) approach is used to solve the problem. We show that when the optimal points are not both at the borders of disks, the solutions of the KKT equations can be obtained in closed-form. For the case where the points are at the circumferences, the problem has no analytical solutions [IBM J. Res. Develop. 34 (5) (1990)]. Instead, we propose for the latter case an iterative algorithm based on computing the distance between a fixed point and a circle. We also show that the point-circle distance problem is solvable in closed-form, and the convergence of the numerical algorithm is linear. (C) 2002 Elsevier Science Inc. All rights reserved.

References:
1. ALMOHAMAD HA, 2002, 20021 AM U SHARJ COM
2. BAZARAA MS, 1993, NONLINEAR PROGRAMMIN
3. CHIN F, 1983, IEEE T COMPUT, V32, P1203
4. LUMELSKY VJ, 1985, INFORM PROCESS LETT, V21, P55
5. MEYER W, 1986, IEEE INT ROB AUT, P597
6. NEFF CA, 1990, IBM J RES DEV, V34
7. ORLOWSKI M, 1985, SIAM C GEOM MODL ROB
8. SCHWARTZ J, 1981, IPL, V13, P168

For pre-prints please write to: abstracts@kfupm.edu.sa