Collision Computation Of Moving Bodies

Selim, SZ; Almohamad, HA

Summary

In this paper, an explicit mathematical representation of n-dimensional bodies moving in translation along general trajectories is derived. This representation is used to find out if two moving bodies are going to collide. An optimization problem is developed for finding the time and location of collision. We consider the special cases of linear and piecewise linear trajectories. The collision in this case can be obtained by solving a linear program or a sequence of linear programs, respectively. The problem of finding the collision time and location of several moving bodies is cast as an integer programming problem. A comprehensive simulation study shows that this approach requires much lesser computation time when compared with the current approach of finding the collision between all pairs of bodies. (C) 1999 Elsevier Science B.V. All rights reserved.

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