Local Avoidance Techniques for Real-Time Crowd Simulation

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Abstract

In this paper I demonstrate the use of Reciprocal Velocity Obstacle, RVO, as a viable local avoidance model for real time agent based crowd simulation.

1 Introduction

Crowd simulation is a growing in films and games, where complete CG worlds are brought to life with their own CG inhabitants. Of course it is not feasible to animate 300 pedestrians in the background of a 10 second shot, or thousands of fans in a sports arena. So the use of crowd simulation tools were bought to life.

2 Local Avoidance in Crowd Simulation

Local avoidance is the avoidance of agents within close proximity of each other, it is useful when there are multiple moving objects in the world that the global navigation system may ignore. Global navigation differs from local avoidance because it looks at finding a route from one location to another, while local avoidance just considers its surroundings and desired direction inn order to avoid collisions while steering towards its goal. Artificial Intelligence also differs from local avoidance although the two can be linked together, AI focuses on creating behaviours of the agents which can indirectly incorporate local avoidance but often this isn't enough to satisfy a collision free system, hence local avoidance can be 'layered' on top.