

Path planning for indoor mobile robot using half-sweep SOR via nine-point Laplacian (HSSOR9L)

Abstract

This paper proposed fast Half-Sweep SOR via Nine-Point Laplacian (HSSOR9L) iterative method for solving path planning problem for a mobile robot operating in indoor environment model. It is based on the use of Laplace's Equation to constraint the distribution of potential values in the environment of the robot. Fast computation with half-sweep iteration is obtained by considering only half of whole points in the configuration model. The inclusion of SOR and 9-point Laplacian into the formulation further speeds up the computation. The simulation results show that HSSOR9L performs much faster than the previous iterative methods in computing the potential values to be used for generating smooth path from a given initial point to a specified goal position.