

Laplacian behaviour-based Control (LBBC) for Robot Path Planning using Explicit Group Successive Over-Relaxation via Nine-Point Laplacian (EGSOR9L) Iterative Method

Abstract

This paper proposed a behaviour-based paradigm approach known as Laplacian Behaviour-Based Control (LBBC) for solving path planning problem for a mobile robot operating in a structured indoor environment. LBBC relies on the use of Laplace's Equation to model the potential function in the environment model. For solving the Laplace's Equation, a numerical technique using a weighted block technique based on a block of four points known as Four Point-EGSOR (4EGSOR) iterative method is used to provide guidance in generating path for the robot. The simulation results show that LBBC provides robust motion for the robot, whilst 4EGSOR ensure faster computation than the previous methods.