Robot path planning using Laplacian behaviour-based control via half-sweep Gauss-Seidel (LBBC-HSGS) Iterative method

Abstract

Essentially, a truly autonomous mobile robot be capable of finding its own path from start to goal location without colliding with any obstacles. This paper investigates the effectiveness of a robot path planning technique that utilizes Laplacian Behaviour-Based Control (LBBC) for robot control and uses Laplace's Equation for generating potential function in the configuration space model. The robot control namely LBBC would enable the robot to recover from getting stuck in a flat region. Furthermore, an efficient iteration technique via Half-Sweep Successive Over-Relaxation (HSSOR) would provide fast computation for solving the Laplace's equation that represents the potential values of the configuration space.