Abstract

This paper introduces an Advanced Artificial Potential Field (AAPF) controller which is used to control the robot’s motion in cluttered environments. The proposed approach gives less computation and increases the reaction speed of the robot at obstacle avoidance situations. The increasing of robot’s reaction speed doesn’t affect on the smoothness of its path due to the use of Genetic algorithms (GA) which select the optimum factors of the forces applied to the robot. A measure of smoothness is used to guide the genetic algorithm to select forces; factors with minimum smoothness. Of course more smoothness means less distance and more speed to reach the goal. The Advanced controller using GA is simulated with different cases on Windows Vista using Matlab Software. These cases include environments with single obstacle up to three obstacles and multi-knee corridor. Results are compared to previous works.

Index Terms

Computer Science
Control Systems
Keywords

Artificial Potential Field  Obstacle Avoidance  Virtual Sensor