

Rotated TOR-5P laplacian iteration path navigation for obstacle avoidance in stationary indoor simulation

ABSTRACT

Lately, autonomous navigation has undergone constant research to develop superior path searching capabilities for self-directed navigation. This study attempt to improve the path navigation competence of a mobile robot by using the computational technique, namely the Half-Sweep Two-Parameter Over Relaxation 5-Point Laplacian (HSTOR-5P) method, to solve pathfinding problems iteratively. The harmonic functions, which are the solution of Laplace's equation, are the sources for generating the potential function of the mobile robot's configuration space. As a result, the experiment shows that a smooth and optimal path in a given space is capable to create from any departure to the target point. Furthermore, it is proved that the HSTOR-5P approach was more effective than its predecessors in solving mobile robot pathfinding problems.