DESIGN AND DEVELOPMENT OF MULTIFUNCTIONAL ROBOT ASSISTANT FOR PATIENT CARE IN HOSPITAL

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ABSTRACT

Artificial Potential Field (APF) is a path planning strategy that is widely used in robotics. Unfortunately, this method is susceptible to the local minimum problem, especially in the Symmetrically Aligned Robot-Obstacle-Goal (SAROG) configuration. In this study, we propose a modified APF by adding perpendicular force to get out of the local minima condition due to SAROG. Furthermore, this modified APF is also applied to the Leader-Follower robot system. In this system, Leaders are assigned to achieve goals while avoiding obstacles. At the same time, Followers need to follow the Leader while maintaining a safe distance. The effectiveness of this method is verified by numerical simulations. The results show that the modified APF using perpendicular force is better in providing navigation for the Leader robot to reach its destination. At the same time, the Follower robot can follow and maintain a tolerable distance from the Leader robot.

Kata Kunci: *Artificial Potential Field, Path Planning, Leader-Follower System, Perpendicular Force, SAROG*