Autonomous Navigation and Obstacle Avoidance for a Wheeled Mobile Robots: A Hybrid Approach

Abstract

In this paper, an autonomous navigation and obstacle avoidance strategy is proposed for an omnidirectional mobile robot. The robot plans a path, starting from an initial point going to a target point. A hybrid approach has been developed where a global approach has been applied to the motion along the desired path (DP) using 2nd order polynomial planning, while a local reactive approach is used to avoid collisions with static and/or dynamic obstacles based on the "sensing vector" and the "gap vector" concepts. The "sensing vector" is a binary vector which provides information about obstacles detection, while the "gap vector" provides information about a possible nearest gap the robot can pass through it.

References

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**Index Terms**

Computer Science   Applied Sciences

**Keywords**

Omnidirectional mobile robot; autonomous navigation; path planning; obstacle avoidance; hybrid approach.