Real Time Adaptive Obstacle Avoidance in Dynamic Environments with Different D-S

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Abstract : In this paper a real-time obstacle avoidance approach for both autonomous and non-autonomous dynamical systems (DS) is presented. In this approach the original dynamics of the controller which allow us to determine safety margin can be modulated. Different common types of DS increase the robot's reactiveness in the face of uncertainty in the localization of the obstacle especially when robot moves very fast in changeable complex environments. The method is validated by simulation and influence of different autonomous and non-autonomous DS such as important characteristics of limit cycles and unstable DS. Furthermore, the position of different obstacles in complex environment is explained. Finally, the verification of avoidance trajectories is described through different parameters such as safety factor.

Keywords : limit cycles, nonlinear dynamical system, real time obstacle avoidance, safety margin

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