Comparative Study of Three Different Path Tracking Controls in Mobile Robots

Abstract

This paper presents a comparative study of three different path tracking control laws for the formation of a group of nonholonomic mobile robots. By introducing a unified error of the formation and trajectory tracking using; the dynamic feedback linearization control [1], dynamic-static feedback linearization control [2] and nonlinear time-invariant control [3] are
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cmpared. The simulations results show that the dynamic-static feedback linearization
technique presents a stable tracking with smoother behaviour and avoiding discontinuities for
tracking trajectory of the robot leader. Finally, this method was implemented experimentally in
three different paths formatting a simple triangle with three mobile robots in a leader-follower
type motion. Moreover, the analysis in this paper reveals some important issues raising that the
following control on this system can be extended to underactuated AUVs in future work.

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Index Terms

Computer Science

Control Systems

Keywords

Multiple robot system  formation path tracking  nonlinear control law