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Distributed consensus-based formation control for multiple nonholonomic mobile robots with a specified reference trajectory.


Summary: In this paper, the distributed formation control problem for multiple nonholonomic mobile robots using consensus-based approach is considered. A transformation is given to convert the formation control problem for multiple nonholonomic mobile robots into a state consensus problem. Distributed control laws are developed for achieving the formation control objectives: a group of nonholonomic mobile robots at least exponentially converge to a desired geometric pattern with its centroid moving along the specified reference trajectory. Rigorous proofs are provided by using graph, matrix, and Lyapunov theories. Simulations are also given to verify the effectiveness of the theoretical results.

Keywords: formation control; consensus-based approach; nonholonomic mobile robots; Lyapunov stability; graph theory
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