

Leader-following consensus of nonlinear multi agent systems based on position and velocity estimations

ABSTRACT

In this paper, leader-following consensus problem of nonlinear multi-agent systems is studied. In order to obtain control law in multi-agent systems, usually agents' information should be exactly known, which may not be available in real applications. In this work, a method is proposed to estimate the position and velocity of agents with arbitrary initial conditions of followers and leaders. Then, the estimations are used to obtain a consensus control law. At first, a single integrator nonlinear multi-agent system with a leader is considered, and a consensus law is proposed using followers' position estimations. Then, for a double integrator nonlinear system, a controller is obtained based on position and velocity estimations. Several simulations are performed to validate the proposed method.