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Title: Distributed Adaptive Dynamic Event-Triggered Control for Multiple Quadrotors

Authors: Hao Wang, Jinjun Shan

Abstract: This paper studies formation control problems for leader-follower multi-quadrotor systems subject to unknown perturbations and limited resources via an event-triggered mechanism. A distributed adaptive dynamic event-triggered formation control (ADETFC) protocol is designed by utilizing a sliding-mode control (SMC) approach, such that the integral sliding-mode manifold can be reached in finite time for the states of the nonlinear, coupled and underactuated system with unknown external disturbances. A distributed integral sliding-mode surface is proposed to guarantee the formation tracking performance as the state trajectories of multi-quadrotor systems move on the constructed sliding manifold. Then, a novel adaptive dynamic triggering strategy is developed to adjust the triggering interval dynamically, and thus reduce the unnecessary resource consumption. Via the Lyapunov stability theory and Barbalat lemma, sufficient conditions to ensure the formation tracking results are derived for leader-follower multi-quadrotor systems. Simulations and experiments to validate the effectiveness of the proposed control scheme are conducted.

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