

Formation Control for Linear Multi-Robot System with Switched Directed Topology and Time-Varying Delays

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Abstract : This study investigate the formation problem for high-order continuous-time multi-robot with bounded symmetric time-varying delay protocol under switched directed communication topology. By using a linear transformation, the formation problem is transformed to stability analysis of a switched delay system. Under the assumption that each communication topology has a directed spanning tree, sufficient conditions are presented in terms of linear matrix inequalities (LMIs) that the multi-robot system can achieve a desired formation by the trade-off among the pre-exist topologies with the help of the scheme of average dwell time. A numeral example is presented to illustrate the effectiveness of the obtained results.

Keywords : multi-robot systems, formation, switched directed topology, symmetric time-varying delay, average dwell time, linear matrix inequalities (lmis)

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