Abstract :

In this paper, a new decentralized fuzzy sliding mode control (DFSMC) strategy for a class of large-scale nonlinear systems (LSNS) with strong unknown interconnections is proposed. The main objective of our contribution is to reduce the used switching gains in the decentralized sliding mode controller (DSMC) to decrease the chattering amplitude in the presence of strong interconnections in each sub-system. To achieve this objective, the global system is decomposed into sub-systems, then, two fuzzy logic approximations are constructed, the first one is used to approximate the unknown interconnections terms in order to provide a better system modelling, and the second is used to generate the discontinuous part of the control law in the (DSMC). Finally, a Quadrotor attitude angles example is presented to show the effectiveness of the proposed control strategy.