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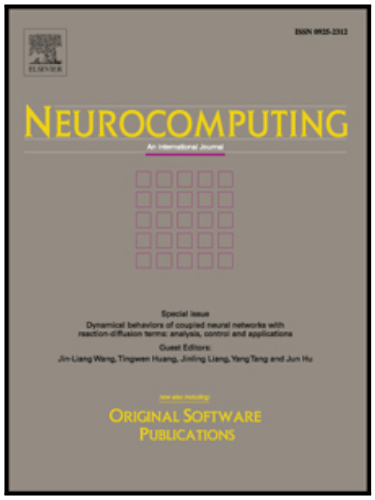

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Yun Shang, Bing Chen, Chong Lin

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Neural adaptive tracking control for a class of high-order non-strict feedback nonlinear multi-agent systems*†

Yun Shang[a,b], Bing Chen[a], and Chong Lin[a]

a. Institute of Complexity Science, Qingdao University, Qingdao, Shandong, P. R. China

b. School of Mathematics and Physics, Qingdao University of Science and Technology, Qingdao, P. R. China

Abstract

This research is mainly concerned with the consensus tracking problem for a class of high-order non-strict feedback nonlinear multi-agent systems, in which the virtual and the actual control items of each follower dynamics are the power functions with positive odd integers rather than linear items. Due to this structural feature of the high-order systems, adding a power integrator technique is employed in controller design to overcome the obstacle caused by high power of virtual and real control items. Meanwhile, Radial Basis Function Neural Networks are used to approximate the uncertain nonlinearities. An adaptive tracking strategy is proposed for this type of multi-agent systems. It is shown that the suggested control scheme can guarantee the boundedness of all the closed-loop signals and ensure that all outputs of follower agents track the leader signal synchronously. Since high-order non-strict feedback nonlinear multi-agent systems include some existing nonlinear multi-agent systems as the special case, our result can be used to control more general nonlinear multi-agent systems. Finally, a numerical example is presented to further verify the effectiveness of the proposed algorithm.

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†Corresponding author: B. Chen (email: chenbing1958@126.com).