

Adaptive Consensus Control of Multi-Agent Systems with Large Uncertainty and Time Delays*

Li Liu

*School of Mechanical Engineering
University of Science and Technology Beijing, Beijing 100083, China*

Yu Meng**

*School of Mechanical Engineering
University of Science and Technology Beijing, Beijing 100083, China*

Dongxu Zou

*School of Automation and Electrical Engineering
University of Science and Technology Beijing, Beijing 100083, China*

Weicun Zhang

*School of Automation and Electrical Engineering
University of Science and Technology Beijing, Beijing 100083, China*

*** Corresponding author. E-mail: myu@ustb.edu.cn*

Abstract

A weighted multi-model adaptive control (WMMAC) method is proposed to achieve consensus of multi-agent system with large parameter uncertainty and communication delays, in which H^∞ control is adopted as local control strategy to deal with smaller parameter uncertainty. Moreover a simple and effective weighting algorithm is adopted to assign weights for each local controller, based on which the global control law is obtained as a weighted sum of all the local control at each time instant. The simulation results demonstrate the effectiveness of the proposed method.

Keywords: Adaptive consensus; Multi-agent system; WMMAC; H^∞ control.

*This work was supported by Major State Basic Research Development Program (973 Program) (No. 2012CB821200), National High-Tech Research and Development Program of China (863 Program) (No. 2011AA060408), Beijing Higher Education Young Elite Teacher Project (No. YETP0362), National Key Technology Research and Development Program of China (No. 2013BAB02B07)

