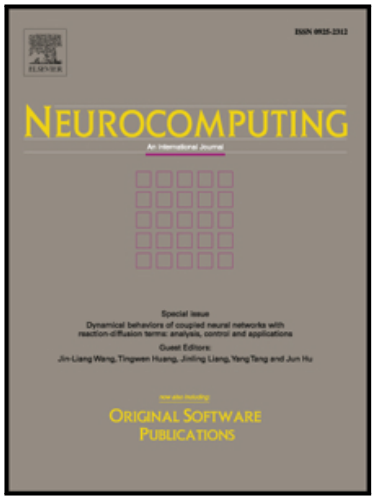
Communicated by Dr Chenguang Yang

Accepted Manuscript



Neural network control of networked redundant manipulator system with weight initialization method

Naijing Jiang, Jian Xu, Shu Zhang

PII: S0925-2312(18)30473-9
DOI: 10.1016/j.neucom.2018.04.039
Reference: NEUCOM 19506

To appear in: *Neurocomputing*

Received date: 24 November 2017
Revised date: 22 March 2018
Accepted date: 16 April 2018

Please cite this article as: Naijing Jiang, Jian Xu, Shu Zhang, Neural network control of networked redundant manipulator system with weight initialization method, *Neurocomputing* (2018), doi: 10.1016/j.neucom.2018.04.039

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

Neural network control of networked redundant manipulator system with weight initialization method

Naijing Jiang[a], Jian Xu[a], Shu Zhang[a,*]

[a]*School of Aerospace Engineering and Applied Mechanics, Tongji University, 1239 Siping Road, Shanghai, China*

Abstract

In this paper, a novel controller is proposed to reach tracking synchronization in task space for networked redundant manipulators in circumstance of unknown system parameters, disturbance and sub-task requirements. We notice that the initial neural weights of neural network controller in existing literatures are sloppily selected which may have influence on tracking performance. In the proposed controller, a universal method is proposed to carefully assign the initial neural weights that are commonly close to the ideal values, and consequently the tracking performance can be improved. Meanwhile, input dimension of neural network is reduced and approximability of neural network is ensured. Simulations are given to show the effectiveness of the proposed controller.

Keywords: Adaptive control, Neural network, Redundant manipulator, Networked Lagrange system

1. Introduction

Control of manipulators has been a hot research spot due to the increasing usage of manipulators in many industrial fields. Coordinated control of redundant manipulators receives particular attention because end effectors are often required to track a given trajectory in task space in industrial applications, such as spraying, welding and slicing, and the redundant joint provides the possibility of completing multi-tasks simultaneously, such as

*Corresponding author.
Email address: zhangshu@tongji.edu.cn (Shu Zhang)

Download English Version:

https://daneshyari.com/en/article/6863740

Download Persian Version:

https://daneshyari.com/article/6863740

Daneshyari.com