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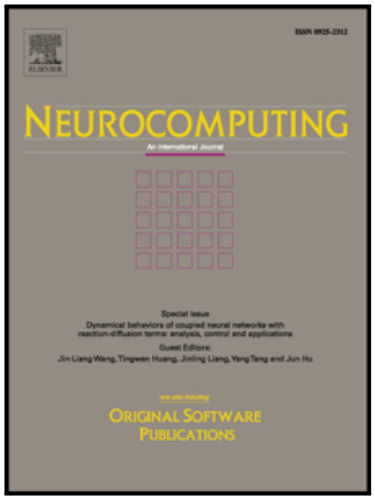

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ACCEPTED MANUSCRIPT

Distributed optimization of multi-agent systems with delayed sampled-data

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Abstract

In this paper, we study the distributed optimization problem of multi-agent systems with delayed sampled-data, where the interconnected topology is directed, weighted-balanced and strongly connected, and also local cost functions are strongly convex with globally Lipschitz gradients. Based on synchronous and asynchronous sampled-data, we construct two respective algorithms. Our main results, sufficient conditions for the convergence to an optimal solution, are obtained under assumption that all design parameters are chosen properly. We also present one example to validate our theoretical results.

Keywords: distributed optimization, consensus, sampled-data, multi-agent system

1. Introduction

Over the past years, distributed optimization problem has been a hot topic. As a result, there are an increasing number of studies conducted on distributed optimization in the context of control theory. Its wide range of applications can be found in various fields, such as statistical machine learning [1], smart grid [2, 3], sensor networks [4], and so on. Based on

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