

Accepted Manuscript

Local Node Cooperative Estimation of Stochastic Systems Using a Switching Network of Heterogeneous Sensors with Communication Delay

Mazda Moattari , Vahid Johari Majd

PII: S0020-0255(18)30203-2
DOI: [10.1016/j.ins.2018.03.024](https://doi.org/10.1016/j.ins.2018.03.024)
Reference: INS 13502



To appear in: *Information Sciences*

Received date: 20 March 2017
Revised date: 7 February 2018
Accepted date: 11 March 2018

Please cite this article as: Mazda Moattari , Vahid Johari Majd , Local Node Cooperative Estimation of Stochastic Systems Using a Switching Network of Heterogeneous Sensors with Communication Delay, *Information Sciences* (2018), doi: [10.1016/j.ins.2018.03.024](https://doi.org/10.1016/j.ins.2018.03.024)

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.

Local Node Cooperative Estimation of Stochastic Systems Using a Switching Network of Heterogeneous Sensors with Communication Delay

Mazda Moattari, Vahid Johari Majd*

Intelligent Control Systems Laboratory, School of Electrical and Computer Engineering, Tarbiat Modares University, Tehran, Iran.

Abstract:

This paper addresses the cooperative stochastic state estimation of a moving target using a switching sensor network that may contain communication delays. The switching in the graph of the sensor network may be due to local communication failures of the neighboring sensors or due to their movements. The network may have heterogeneous sensors with different measurement vectors of various combinations of states. Using a Kalman filter, the states of the target system are estimated at each node having only its local neighboring information. The network nodes cooperate locally with a packet-based communication to improve the estimation. Finally, numerical examples are provided to show the effectiveness of the scheme. The results are compared with the centralized and local estimations.

Keywords: Cooperative estimation, sensor network, heterogeneous sensors, switching topology, delay.

1. Introduction

Multi-agent systems, group networks, and wireless sensor networks (WSNs) have attracted increasing interest due to their widespread applications such as target tracking, formation control, satellite groups, network traffic control, automated highway systems, and mobile robots [3,13,15]. As the measurements are distributed over a network of sensors, the network nodes should cooperate with each other by intercommunication; hence, cooperative estimation and control are suitable approaches in these problems [11,23]. An important challenge in WSNs especially mobile WSNs is

* Corresponding Author, Address: P.O. Box 14115-194, Tehran, Iran, E-mail address: majd@modares.ac.ir (V.J. Majd), web page: <http://www.modares.ac.ir/~majd>, Tel./Fax: +98 21 8288-3353.

Download English Version:

<https://daneshyari.com/en/article/6856463>

Download Persian Version:

<https://daneshyari.com/article/6856463>

[Daneshyari.com](https://daneshyari.com)