

# Author's Accepted Manuscript

A Distributed Particle Filtering Approach for Multiple Acoustic Source Tracking Using an Acoustic Vector Sensor Network

Xionghu Zhong, Arash Mohammadi, A.B. Premkumar, Amir Asif



[www.elsevier.com/locate/sigpro](http://www.elsevier.com/locate/sigpro)

PII: S0165-1684(14)00454-X  
DOI: <http://dx.doi.org/10.1016/j.sigpro.2014.09.031>  
Reference: SIGPRO5601

To appear in: *Signal Processing*

Received date: 2 September 2013  
Revised date: 21 September 2014  
Accepted date: 24 September 2014

Cite this article as: Xionghu Zhong, Arash Mohammadi, A.B. Premkumar, Amir Asif, A Distributed Particle Filtering Approach for Multiple Acoustic Source Tracking Using an Acoustic Vector Sensor Network, *Signal Processing*, <http://dx.doi.org/10.1016/j.sigpro.2014.09.031>

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 galley proof before it is published in its final citable 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.

# A Distributed Particle Filtering Approach for Multiple Acoustic Source Tracking Using an Acoustic Vector Sensor Network

Xionghu Zhong<sup>a\*</sup>, Arash Mohammadi<sup>b\*</sup>, A. B. Premkumar<sup>c\*</sup>, and Amir Asif<sup>b\*</sup>

<sup>a</sup>*Centre for Multimedia and Network Technology, The School of Computer Engineering, College of Engineering, Nanyang Technological University, Singapore. 639798.*

<sup>b</sup>*Department of Computer Science and Engineering, York University, Canada. M3J 1P3.*

<sup>c</sup>*Electrical Engineering Department, Faculty of Engineering University of Malaya, Kuala Lumpur, Malaysia.*

---

## Abstract

Different centralized approaches such as least-squares (LS) and particle filtering (PF) algorithms have been developed to localize an acoustic source by using a distributed acoustic vector sensor (AVS) array. However, such algorithms are either not applicable for multiple sources or rely heavily on sensor-processor communication. In this paper, a distributed unscented PF (DUPF) approach is proposed for multiple acoustic source tracking. At each distributed AVS node, the first order and the second order statistics of the local state are estimated by using an unscented information filter (UIF) based PF. The UIF is employed to approximate the optimum importance function due to its simplicity, by which the matrix operation is the state informa-

---

\*corresponding author, EURASIP member.

*Email addresses:* xhzhong@ntu.edu.sg (Xionghu Zhong<sup>a</sup>), marash@cse.yorku.ca (Arash Mohammadi<sup>b</sup>), benjamin.premkumar@gmail.com (A. B. Premkumar<sup>c</sup>), asif@cse.yorku.ca ( and Amir Asif<sup>b</sup>)

Download English Version:

<https://daneshyari.com/en/article/6959799>

Download Persian Version:

<https://daneshyari.com/article/6959799>

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