

Wireless synchronization protocols for collaborative robotic and sensor environments

Stratulat, B. ; Barzeianu, S. ; Micea, M. ; Groza, V. ;
Dept. of Comput. & Software Eng., Politeh. Univ. of Timisoara, Timisoara, Romania

This paper appears in: Robotics in Alpe-Adria-Danube Region (RAAD), 2010 IEEE 19th International Workshop on

Issue Date : 24-26 June 2010

On page(s): 25 - 30

Location: Budapest

Print ISBN: 978-1-4244-6885-0

INSPEC Accession Number: 11446988

Digital Object Identifier : 10.1109/RAAD.2010.5524616

Date of Current Version : 26 July 2010

ABSTRACT

In this paper we consider the problem of time synchronization in collaborative environments of robots and intelligent sensors. Due to its superior performance, the Precision Time Protocol (PTP) has been implemented and tested using various topologies of complex, multi-hop networks. Two distinct approaches have been studied. The first one uses boundary clocks, while the second uses a transparent clock for the intermediary nodes. A set of experiments and simulations have been conducted with the OMNeT++ environment. Finally, we propose and discuss a modified version of the PTP protocol, specifically designed to consider the particular problems of networks with mobile robotic nodes.

INDEX TERMS

- **INSPEC**

- **Controlled Indexing**

- cooperative systems , intelligent sensors , mobile robots , multi-robot systems , protocols , synchronisation , telecommunication network topology , wireless sensor networks

- **Non Controlled Indexing**

- OMNeT++ environment , boundary clocks , collaborative robotic environments , intelligent sensors , mobile robotic nodes , multihop networks , network topologies , precision time protocol , sensor environments , time synchronization , transparent clock , wireless synchronization protocols

- **Author Keywords**

- Precision Time Protocol , collaborative environments , robotic collectives , synchronization protocols , wireless sensor networks