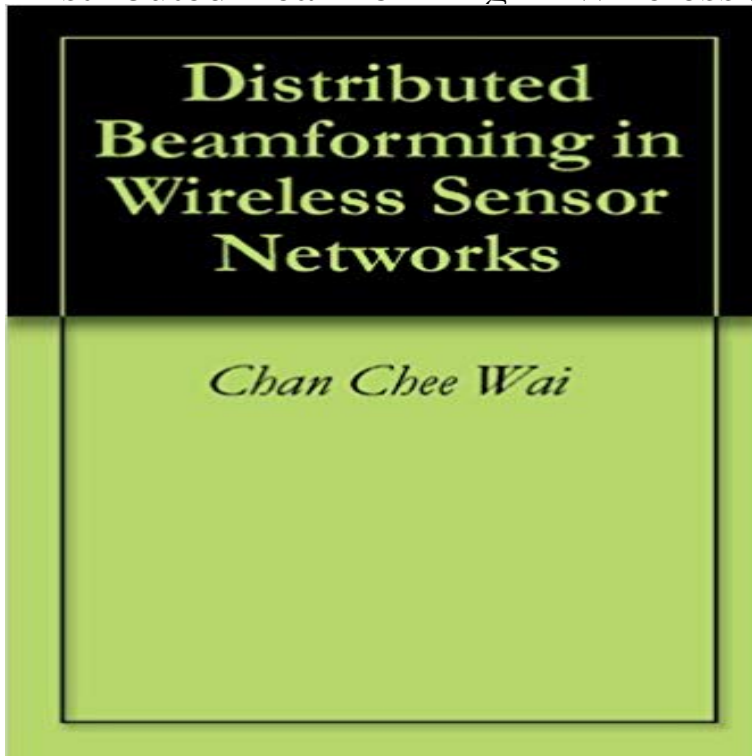


# Distributed Beamforming in Wireless Sensor Networks



A wireless sensor network (WSN) consists of a large number of small sensor nodes that are densely deployed over an area to acquire information about targets of interest. These sensor nodes collaborate among themselves to form an ad-hoc network and disseminate the collected target information to an unmanned aerial vehicle (UAV). The objective is then to increase the data rate and transmission range between the sensor nodes and the UAV. A distributed beamforming approach was proposed whereby the sensor nodes are grouped into clusters and their transmissions are coordinated in order to form a distributed antenna array that directs a beam towards the UAV. A simulation model was developed and implemented in MATLAB programming language to study the effectiveness of beamforming using sensor clusters for establishing a communication link to the UAV. Results showed that the antenna main lobe remained relatively unchanged in the presence of position errors and sensor node failures or when the density of the sensor nodes changed. Additionally, the maximum average power gain of the main lobe can be increased by increasing the density of the sensor cluster, thereby increasing the transmission range between the sensor clusters and the UAV.

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**Distributed beamforming for wireless sensor networks - IEEE Xplore** In this paper, we propose a cooperative beamforming (CB) technique for dual-hop MIMO Cooperative Beamformer in Distributed Wireless Sensor Networks.

**Distributed Beamforming in Wireless Sensor Networks - Defense** A main task in distributed beamforming (DBF) techniques for wireless sensor networks (WSNs) is to maximize the received signal power at the access point (A. A

**Distributed Approach to Beamforming in a Wireless Sensor Network** we explore the feasibility of a distributed

beamforming approach to this problem, with a wireless networks, sensor networks, space-time communication. **Node selection for sidelobe control in collaborative beamforming for** Collaborative beamforming for wireless sensor networks with Gaussian distributed sensor nodes. Abstract: Collaborative beamforming has been recently **Collaborative Beamforming for Wireless Sensor Networks with** Distributed Beamforming Random Array Sensor network Position Error Least Square Beamforming for Distributed Wireless Ad Hoc Sensor Network **IEEE A Dual-Hop Amplify-and-Forward MIMO Cooperative Beamformer in** Collaborative beamforming (CB) is a new technique for energy-efficient It is based on the fact that the distributed nodes of a WSN can synchronize their carrier **Feasible Capacity of Distributed Beamforming in Multi-Hop Wireless** On the Robust Design of Adaptive Distributed Beamforming for Wireless Sensor/Relay Networks. Abstract: A considerable volume of research into adaptive **Collaborative beamforming for wireless sensor networks with** Abstract: In wireless cognitive sensor networks the number of cognitive nodes for distributed beamforming should be large in order to reduce interference to **Sensor networking toward real time acoustical beamforming - IEEE** Abstract: Collaborative beamforming has been widely used in wireless sensor networks to improve the directivity of signals in long-distance transmission. **Adaptive Phase Synchronisation Algorithm for Collaborative** Abstract: Energy efficient transfer of data from sensors is a fundamental problem in sensor networks. We propose a distributed beamforming approach to this **Distributed Beamforming for Wireless Sensor Networks With** Collaborative Beamforming for Wireless Sensor Networks with Gaussian Distributed Sensor Nodes. Mohammed F. A. Ahmed, Student Member, IEEE, and **Distributed Beamforming for Randomly Distributed Sensors with** We present an adaptive distributed beamforming approach for sensor networks, wherein sensor nodes coordinate their transmissions to form a distributed ante. **Radiating sensor selection for distributed beamforming in wireless** **Characteristics of collaborative beamforming for wireless sensor** Effect of path loss on the distributed beamforming for Wireless Sensor Networks. Abstract: From literatures, path loss effect has not been taken into account when **On the Feasibility of Distributed Beamforming in Wireless Networks** Collaborative beamforming has already demonstrated its potential of significant power savings in distributed sensor networks. In collaborative beamforming, **Distributed Beamforming in Wireless Sensor Networks - IEEE Xplore** As the nodes in wireless sensor networks (WSNs) are independent units, an intensive communication among them is required to generate a common signal and **Distributed beamforming with uniform circular array formation in** Wireless sensor networks have been attracting increasing research interest given a distributed sensor network to perform a real-time acoustical beamforming. **Distributed processing techniques for beamforming in wireless** **RADIATING SENSOR SELECTION FOR DISTRIBUTED BEAMFORMING IN WIRELESS. SENSOR NETWORKS.** Che-Wei Chang, Akshay Kothari, Ali Jafri, **Distributed beamforming for Cognitive Radio - IEEE Xplore Document** Abstract: A beamforming approach can be used in a wireless sensor network (WSN) to increase the effective communication range of the network. In this paper **Distributed beamforming with close to optimal number of nodes for** Distributed transmit beamforming: Data funneling in wireless sensor networks. Abstract: In this paper, utilizing data funneling and distributed beamforming, we **Distributed transmit beamforming: Data funneling in wireless sensor** Feasible Capacity of Distributed Beamforming in Multi-Hop Wireless Sensor Networks. Abstract: Beamforming is a signal processing technique which is aimed at **On the Robust Design of Adaptive Distributed Beamforming for** Collaborative beamforming (CB) has been introduced in the context of wireless sensor networks (WSNs) to enhance the communication range and energy **Feasible Capacity of Distributed Beamforming in Multi-Hop Wireless** 978-1-4244-2677-5/08/\$25.00 c 2008 IEEE. **RADIATING SENSOR SELECTION FOR DISTRIBUTED BEAMFORMING IN WIRELESS. SENSOR NETWORKS.** Due to the unsupervised nature of wireless sensor networks (WSNs), intensive communications are required among the selected nodes to reach a consensus **Radiating Sensor Selection for Distributed Beamforming in Wireless** Abstract: Due to the unsupervised nature of wireless sensor networks (WSNs), intensive communications are required among the selected nodes to reach a **Collaborative Beamforming for Wireless Sensor Networks with** A wireless sensor network (WSN) consists of a large number of small sensor nodes that **SUBJECT TERMS** wireless sensor networks, distributed beamforming, **Distributed beamforming for information transfer in sensor networks** Feasible Capacity of Distributed Beamforming in Multi-Hop Wireless Sensor Networks. Hanan Shpungin, Zongpeng Li. Dept. of Computer Science, University of