

## WSN中的分布式压缩感知

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摘要:

为了解决传统的压缩感知算法在无线传感器网络中实现的难题, 首先研究了用定时器控制ADC进行随机压缩采样的压缩感知技术, 实验表明, 该方法有效可行。在此基础上提出了基于无线传感器网络的分布式压缩感知算法。该算法通过对随机压缩采样序列的拆分实现分布式压缩采样, 最后利用合并后的采样值和CoSaMP算法完成对信号的重构。仿真和实验表明, 该方法能够在星型网络拓扑中实现以1/10的标准采样频率下实现信号的重构。

关键词: 无线传感器网络; 压缩感知; 随机压缩采样; 分布式压缩感知

## Distributed Compressive Sensing in WSN

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**Abstract:**

In order to solve the problem of sampling with Compressive Sensing (CS) in Wireless Sensor Network (WSN), the method of Randomly Compressive Sampling is studied, which uses Timer to control Analogy to Digital Converter. The experimental results show that it is effective and feasible. On the basis of this, a new algorithm of Distributed Compressive Sensing in WSN is proposed, which realizes Distributed Compressive Sampling through distributing the random sequence. Then the algorithm of CoSaMP were used to reconstruct original signal with the joined sampling values. Simulation and experiment show that the proposed method can achieve analogy signal collection with a sampling frequency below 1/10 percentage of standard sampling frequency in a star network topology.

**Keywords:** Wireless Sensor Network; Compressive Sensing; Randomly Compressive Sampling; Distributed Compressive Sampling

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