

**A NOVEL APPROXIMATION FOR MULTI-HOP
CONNECTED
CLUSTERING PROBLEM IN WIRELESS NETWORKS**

MICANS INFOTECH

ABSTRACT

Wireless sensor networks (WSNs) have been widely used in a plenty of applications. To achieve higher efficiency for data collection, WSNs are often partitioned into several disjointed clusters, each with a representative cluster head in charge of the data gathering and routing process. Such a partition is balanced and effective, if the distance between each node and its cluster head can be bounded within a constant number of hops, and any two cluster heads are connected. Finding such a cluster partition with minimum number of clusters and connectors between cluster heads is defined as minimum connected d -hop dominating set (d -MCDS) problem, which is proved to be NP-complete.

MICHAEL S. FORBES



CONT...

In this paper, we propose a distributed approximation named CS-Cluster to address the d -MCDS problem under unit disk graph. CS-Cluster constructs a sparser d -hop maximal independent set (d -MIS), connects the d -MIS, and finally checks and removes redundant nodes.

We prove the approximation ratio of CS-Cluster is $(2d+1)\lambda$, where λ is a parameter related with d but is no more than 18.4. Compared with the previous best result $O(d^2)$, our approximation ratio is a great improvement. Our evaluation results demonstrate the outstanding performance of our algorithm compared with previous works.



EXISTING SYSTEM

- Due to the battery limitation of sensors, energy conservation is always an important factor for extending the lifetime of WSNs, and a lot of researches have been done for this problem.
- In addition, sensor nodes also have constraints on communication bandwidth, communication range, and storage space. Thus, a message may be transferred multiple times through several intermediate nodes along a path to its destination.
- This kind of flooding-like routing scheme causes huge amount of traffic collision, message redundancy, and energy consumption.



PROPOSED SYSTEM

- The most important part for clustering scheme is to efficiently partition the given WSN into disjointed clusters and many algorithms were proposed to achieve this purpose.
- In , through coordination of nodes in the same cluster, the authors proposed a clustering algorithm to optimize the energy conservation. Load balancing is also a crucial issue for clustering mechanisms.

MICANS INFOTECH



HARDWARE REQUIREMENTS

- Processor - Pentium-IV
- Speed - 1.1 Ghz
- RAM - 256MB(min)
- Hard Disk - 20 GB
- Key Board - Standard Windows Keyboard
- Mouse - Two or Three Button Mouse
- Monitor - SVGA

MICANS INFOTECH



SOFTWARE REQUIREMENTS

- Tool - Network Simulator-2
- Operating system - LINUX
- Front end - OTCL (Object Oriented Tool Command Language)

MICANS INNOTECH



REFERENCES

- [1] J. Wang, Z. Cao, X. Mao, and Y. Liu, “Sleep in the dins: Insomnia therapy for duty-cycled sensor networks,” in *Proc. IEEE INFOCOM*, Apr./May 2014, pp. 1186–1194.
- [2] S. Guo, C. Wang, and Y. Yang, “Mobile data gathering with Wireless Energy Replenishment in rechargeable sensor networks,” in *Proc. IEEE INFOCOM*, Apr. 2013, pp. 1932–1940.
- [3] Q. Liao *et al.*, “Visualizing anomalies in sensor networks,” *ACM SIGCOMM Comput. Commun. Rev.*, vol. 41, no. 4, pp. 460–461, 2011.
- [4] I. F. Akyildiz, W. Su, Y. Sankarasubramaniam, and E. Cayirci, “A survey on sensor networks,” *IEEE Commun. Mag.*, vol. 40, no. 8, pp. 102–114, Aug. 2002.

