吉首大学学报自然科学版 » 2011, Vol. 32 » Issue (1): 56-62 DOI:



# 无线传感器网络数据采集关键技术及研究进展

（1.吉首大学物理科学与信息工程学院,湖南 吉首 416000；2.中山大学信息科学与技术学院,广东 广州 510006；3.湖南大学电气与信息工程学院，湖南 长沙 410082）

## Key Technologies and Evolution in Wireless Sensor Network Data Gathering

(1.College of Physics Science and Information Engineering,Jishou University,Jishou 416000,China；2.School of Information Science and Technology,Sun Yat-sen University,Guangzhou 510006,China；3.College of Electricity and Information Engineering,Hunan University,Changsha 410082,China)


- 摘要
- 参考文献
- 相关文章

全文: PDF (732 KB) HTML (1 KB) 输出: BibTeX | EndNote (RIS) 背景资料


**摘要** 无线传感器网络(WSN)数据采集因自组织网络结构而具有其他网络无可比拟的优势，然而其资源有限的特点使得许多关键问题尚未有好的解决策略.总结了WSN数据采集中的关键技术及所面临的主要挑战，介绍了数据采集中WSN网络协议的主要性能指标及其研究方法，并就当前几种新技术与WSN的结合情况进行了分析和讨论，最后对无线传感器网络数据采集关键技术的未来研究进行了展望.

**关键词：** 无线传感网络 综述 数据采集 MIMO

**Abstract:** Because of the self-organization network structure,wireless sensor network (WSN) data gathering has enormous advantages compared with other networks.However,many key problems have not been resolved in wireless sensor networks yet because of limited resources.In this paper,the key technology and main challenges in WSN data gathering are summarized,and the main performance index and research methods of WSN network protocols in data gathering are introduced.At the same time,several new technology combined with WSN are analyzed and discussed.In the end,the research direction in the future is prospected.

**Key words:** wireless sensor networks summary data gathering MIMO

**服务**
- 把本文推荐给朋友
- 加入我的书架
- 加入引用管理器
- E-mail Alert
- RSS

**作者相关文章**
- 梁平原
- 陈炳权
- 谭子尤

**基金资助：**

国家自然科学基金资助项目(60673086)；湖南省教育厅科学研究项目(07C526)

**作者简介**：梁平原（1972-），男，湖南涟源人，吉首大学物理科学与信息工程学院高级实验师，中山大学信息科学与技术学院博士生，主要从事无线传感器网络、MIMO、随机多址竞争和光通信等研究.

**引用本文:**

梁平原,陈炳权,谭子尤. 无线传感器网络数据采集关键技术及研究进展 [J]. 吉首大学学报自然科学版, 2011, 32(1): 56-62.

LIANG Ping-Yuan,CHEN Bing-Quan,TAN Zi-You. Key Technologies and Evolution in Wireless Sensor Network Data Gathering[J]. Journal of Jishou University (Natural Sciences Edit, 2011, 32(1): 56-62.

[1] 孙利民,李建中,陈渝，等.无线传感器网络 [M].北京:清华大学出版社,2005.

[2] AKKAYA K,YOUNIS M.A Survey of Routing Protocols in Wireless Sensor Networks [J].Ad. Hoc. Network,2005,3(3):325-349.

[3] KOCHAN V,LEE K,KOCHAN R,et al.Sachenko,Approach to Improvement the Network Capable Application Processor Compatible with IEEE 1451 Standard [J].Technology and Application,2003,9(4):437-441.

[4] AKYIDIZ I F,SU W,SANKARASUBRAMANIAM Y,et al.A Survey on Sensor Networks [J].IEEE Communications Magazine,2002,40(8):102-114.

[5] 刘明,蒋海刚,毛莺池,等.高效节能的传感器网络数据收集和聚合协议 [J].软件学报, 2005, 16(12): 2106-2116.

[5] 刘明,龚海刚,毛莺池,等.高效节能的传感器网络数据收集和聚合协议 [J].软件学报，2005，16(12)：2 100-2 110.

[6] 石为人，袁久银，雷璐宁.无线传感器网络覆盖控制算法研究 [J].自动化学报，2009，35(5):540-545.

[7] HEINELMAN W R,CHANDRAKASAN A,BALAKRISHNAN H.Energy-Efficient Communication Protocol for Wireless Micro-Sensor Networks [M].USA:IEEE HICSS,2000:1-10.

[8] HEINZELMAN W B,CHANDRAKASAN A P,BALAKRISHNAN H.An Application-Specific Protocol Architecture for Wireless Micro-Sensor Networks [J].IEEE Transactions on Wireless Communication,2002,1(4):660-670.

[9] LINDSEY S,RAGHAVENDRA C S.PEGASIS：Power-Efficient Gathering in Sensor Information Systems [M].USA:IEEE Aerospace Conference,2002:1 125-1 130.

[10] LINDSEY S,RAGHAVENDRA C,SIVALINGGAM K M.Data Gathering Algorithms in Sensor Networks Using Energy Metrics [J].IEEE Trans. Parallel and Distributed Systems,2002，13(9):924-935.

[11] MANJESHWAR A,AGRAWAL D P.TEEN:A Routing Protocol for Enhanced Efficiency in Wireless Sensor Networks [C]//The Int' l Parallel and Distributed Processing Symposium(IPDPS' 01).USA:Hyatt Regency,2001:2 009-2 015.

[12] MANJESHWAR A,AGRAWAL D P.APTEEN:A Hybrid Protocol for Efficient Routing and Comprehensive Information Retrieval in Wireless Sensor Networks [C]//The Int' l Parallel and Distributed Processing Symposium(IPDPS' 02).USA:Fort Lauderdale,2002:195-202.

[13] BIAN X,LIU X,CHO H.Study on a Cluster-Chain Routing Protocol in Wireless Sensor Networks [C]//The 3rd Int' l Conference on Communications and Networking (China Com' 08).China:Hangzhou,2008:964-968.

[14] LIU X,BIAN X,CHO H.A Novel Cluster-Chain Channel Adaptive Routing Protocol in Wireless Sensor Networks [C]//The 5th Int' l ICST Conference on Heterogeneous Networking for Quality,Reliability,Security and Robustness (ICST Qshine).China:Hong Kong,2008:28-31.

[15] 李方敏,刘新华,旷海兰.无线传感器网络中一种高能效低延时的泛洪算法研究 [J].通信学报,2007,28(8):46-53.

[16] TANG Wei-guo,WANG Lei.Cooperative OFDM for Energy-Efficient Wireless Sensor Networks [J].IEEE Communications Society,USA:D.C.,2008.

[17] YU Young-jin,HIDEKAZU MURATA.Multi-Hop Cooperative Sensing and Transmit Power Control Based on Interference Information for Cognitive Radio [C]//The 18th Annual IEEE International Symposium on Personal,Indoor and Mobile Radio Communications (PIMRC' 07).2007.

[18] CHEBOLU M,JAYAWEERA S K.Energy Efficiency Analysis of an RLS-Based Adaptive Signal Processing Algorithm for Energy Aware Sensor Networks [C]//The 2nd International Conf. on Intelligent Sensing and Informnrion Processing [ICISIP 05).India:Chennai,2005.

[19] YE F,ZHONG G,LU S W,et al.PEAS:A Robust Energy Conserving Protocol for Long-Lived Sensor Networks [C]//Proceedings of the 10th International Conference on Network Protocols.USA:Washington D. C.,2003:200-201.

[20] ZHANG H,HOU J C.Maintaining Sensing Coverage and Connectivity in Large Sensor Networks [J].Ad. Hoc. and Sensor Networks,2005,1(1-2):89-124.

[21] CUI S,GOLDSMITH A J,BAHAI A.Energy-Efficiency of MIMO and Cooperative MIMO Techniques in Sensor Networks [J].IEEE J.Select.Areas.Commun.,2003，22（6）：1 089-1 098.

[22] SUNG Y.MISRA S,TONG L.Cooperative Routing for Distributed Detection in Large Sensor Networks [J].Selected Areas in Communications,2007,25(2):471-483.

[23] TUAN-DUC NGUYEN,OLIVIER BERDER,OLIVIER SENTIEYS.Cooperative MIMO Schemes Optimal Selection for Wireless Sensor Networks [C]//The 65th IEEE Vehicular Technology Conference.Ireland:Publin,2007:85-89.

[24] LI Xiao-hua.Energy Efficient Wireless Sensor Networks with Transmission Diversity [J].IEE Electronics Letters,2003，39：1 753-1 755.

[25] Zhanshan (Sam) MA.Insect Population Inspired Wireless Sensor Networks:A Unified Architecture with Survival Analysis,Evolutionary Game Theory,and Hybrid Fault Models [C]//International Conference on Bio Medical Engineering and Informatics.China:Hainan,2008.

[26] MA Yi-zhong,CAO Hui,MA Jun.The Intrusion Detection Method based on Game Theory in Wireless Sensor Network [C]//Ubi-Media Computing,2008 First IEEE International Conference.China:Beijing,2008:326-331.

[27] SANG-SEON BYUN.Dynamic Spectrum Allocation in Wireless Cognitive Sensor Networks:Improving Fairness and Energy Efficiency [C]//The 68th IEEE Vehicular Technology Conference.Canada:Calgary,2008:1-5.

[1] 张艳霞, 胡双炎. **多串口多线程交通信号灯数据采集软件系统设计**[J]. 吉首大学学报自然科学版, 2011, 32(4): 68-70.

通讯地址：湖南省吉首市人民南路120号《吉首大学学报》编辑部　邮编：416000
电话传真：0743-8563684　E-mail：xb8563684@163.com　办公QQ：1944107525