传感技术学报
中国微米纳米技术学会
全国高校传感技术研究会 主办

基于无线传感网络的大体积混凝土裂缝监控技术

作　者：孙红兵, 俞阿龙

单　位：淮阴师范学院物理与电子电气工程学院

基金项目：江苏省产学研前瞻性联合研究项目

摘　要：

对大体积混凝土浇灌过程中的温度和温度应力进行监测与控制，可以有效防止裂缝的产生。在分析了大体积混凝土温度和应力常见监测方法的特点后，提出一种基于无线传感网络和移动agent技术的分布式温度和应力监控系统。系统利用无线传感器节点采集混凝土温度和应力等信号，实现并行的分布式信息采集与处理，安装布置简便；将移动agent应用于无线传感网络以解决异构系统间协作、协调及信息融合，有效降低了冗余数据的传输及节点能耗。详细分析了系统结构组成及设计方法，并利用该系统进行了现场测试，实验结果表明,该系统能够较好实现对混凝土施工过程中的温度、应变情况进行实时在线监测。

关键词：无线传感网络;大体积混凝土;裂缝;移动agent;

Mass concrete crack monitoring technology based on wireless sensor networks

Author's Name:

Institution:

Abstract:

The monitor and control of temperature and temperature stress for large volume concrete casting process can effectively prevent the generation of cracks. After analyzing the characteristics of the usual monitoring methods for mass concrete temperature and stress, the paper has presented a distributed temperature and stress monitoring system based on wireless sensor networks and mobile agent technology. By using wireless sensor node for the concrete temperature and stress, the parallel distributed information collection and processing are realized. The operation and installment are convenient and reliable with network topology and the real overall distributed pattern. By applying mobile agent into wireless sensor networks to solve the collaboration, coordination and information fusion between heterogeneous systems, the transmission of the redundant data and the node energy consumption are effectively reduced. The experimental results show that the system can achieve real-time online monitor of the temperature and strain of the concrete construction.

Keywords: Wireless sensor network; Mass concrete; crack; Mobile agent;

投稿时间：**2012-12-09**

查看pdf文件