A Simple Data Compression Algorithm
for Wireless Sensor Networks

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Abstract. The energy consumption of each wireless sensor node is one of critical issues that require careful management in order to maximize the lifetime of the sensor network since the node is battery powered. The main energy consumer in each node is the communication module that requires energy to transmit and receive data over the air. Data compression is one of possible techniques that can reduce the amount of data exchanged between wireless sensor nodes. In this paper, we proposed a simple lossless data compression algorithm that uses multiple Huffman coding tables to compress WSNs data adaptively. We demonstrate the merits of our proposed algorithm in comparison with recently proposed LEC algorithm using various real-world sensor datasets.

Keywords: Wireless Sensor Networks, Energy Efficiency, Data Compression, Signal Processing, Adaptive Entropy Encoder, Huffman Coding.

1 Introduction

Wireless sensor networks (WSNs) are very large scale deployments of tiny smart wireless sensor devices working together to monitor a region and to collect data about the environment. Sensor nodes are generally self-organized and they communicate with each other wirelessly to perform a common task. The nodes are deployed in large quantities (from tens to thousands) and scattered randomly in an ad-hoc manner in the sensor field (a large geographic area). Through advanced mesh networking protocols,

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