

# Opportunistic Source Coding for Data Gathering in Wireless Sensor Networks

Tao Cui  
California Institute of Technology  
MC 136-93  
Caltech  
Pasadena, CA 91125  
cuitao52@hotmail.com

## ABSTRACT

We propose a jointly opportunistic source coding and opportunistic routing (OSCOR) protocol for correlated data gathering in wireless sensor networks. OSCOR improves data gathering efficiency by exploiting opportunistic data compression and multi-user diversity on wireless broadcast. OSCOR attacks challenges across network protocol layers by incorporating a slightly modified 802.11 MAC, a distributed source coding scheme based on Lempel-Ziv code and network coding, and a node compression ratio dependent metric combined with a modified Dijkstra's algorithm for path selection. We simulate OSCOR's performance and show it reduces the number of transmissions by nearly 25% compared with other schemes in small networks.