

# EFFICIENT AND SECURE IMAGE AND VIDEO PROCESSING AND TRANSMISSION IN WIRELESS SENSOR NETWORKS

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## Abstract:

Sensor nodes forming a network and using wireless communications are highly useful in a variety of applications including battle field (military) surveillance, building security, medical and health services, environmental monitoring in harsh conditions, for scientific investigations on other planets, etc. But these wireless sensors are resource constricted: limited power supply, bandwidth for communication, processing speed, and memory space. One possible way of achieve maximum utilization of those constrained resource is applying signal processing and compressing the sensor readings. Usually, processing data consumes much less power than transmitting data in wireless medium, so it is effective to apply data compression by trading computation for communication before transmitting data for reducing total power consumption by a sensor node. However the existing state of the art compression algorithms are not suitable for wireless sensor nodes due to their limited resource. Therefore there is a need to design signal processing (compression) algorithms considering the resource constraint of wireless sensors. In our work, we designed a lightweight codec system aiming surveillance as a target application. In designing the codec system, we have proposed new design ideas and also tweak the existing encoding algorithms to fit the target application. Also during data transmission among sensors and between

sensors and base station, the data has to be secured. We have addressed some security issues by assessing the security of wavelet tree shuffling as the only security mechanism.

## Description:

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