PERFORMANCE ANALYSIS FOR DCT-BASED CODED IMAGE COMMUNICATION IN WIRELESS MULTIMEDIA SENSOR NETWORKS

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Abstract- The objective of this paper is to study the image communication behavior of a wireless video sensor, and analyze its performance under resource constrained wireless multimedia sensor networks. Energy consumption and rate distortion model of DCT-based coded image compression and transmission is developed. Based on energy consumption and rate distortion model proposed, resource allocation is optimized with limited energy and bandwidth. Number of DCT coefficient and step size of quantization table is adapted according to the activity of monitoring scene, and then the energy consumption will be minimized. Simulations results are conducted to show the performance of our work. The proposed scheme dramatically reduces image compression and transmission energy consumption under expected image distortion and transmission rate.

Index terms: Wireless multimedia sensor networks, image compression, image transmission, DCT.