

Abstract

This thesis presents an approach of image transmission in wireless sensor networks which is robust to packet loss and agrees with limitations of sensor nodes. The main concept relies on a process of packetizing and block compression which aims to reduce the influence of packet loss during multi-hop communication. We have studied factors and efficiency of our proposed method by applying BTC and CDF 5/3 as compression algorithms, compared with the transmission of JPEG image over wireless sensor networks. We have simulated scenarios of sending rice field images through a 100-nodes network using TOSSIM and TinyOS software. PSNR and the amount of packets are selected as metrics for quality and energy consumption respectively. The study has revealed that our proposed method is more robust and energy-efficient compared to JPEG image transmission. In addition, reconstructed images also preserve required characteristics for agricultural applications such as color and condition of crops. The CDF 5/3 wavelet compression method shows better image quality compared to the BTC compression method at the packet loss of 16%.