Abstract

In this paper, we present an evaluation of various wavelet filters in the context of an energy efficient integer wavelet transform on SPARTAN 3E FPGA. The usage of different wavelet filters (Daubechies-9/7, Daubechies-5/3, Haar, etc.) for differential frames is investigated, where we mainly focus on computation time and average image quality of the video stream. We port this software system to a hardware system. Based on wavelet transform, we propose an Energy Efficient Wavelet Image Transform Algorithm (EEIWTA) for lossy compression of video, enabling significant reductions in computation as well as communication energy needed, with minimal degradation in image quality. Additionally, we identify video compression parameters that can be used to effect trade-offs between the energy savings, quality of the image and required communication bandwidth. Finally, the proposed system was implemented. We present energy efficient, adaptive data codec for image and video that can significantly minimize the energy required for wireless image communication, while meeting bandwidth constraints of the wireless networks, as the image quality and latency constraints of the wireless service. In this paper, the optimum method of wavelet transformation is explored. Performance Measure of different Wavelets is compared with and without elimination scheme. Simulation results show the important properties of wavelet, which have to be considered for, image compression. Peak signal to noise ratio (PSNR) is used as a measure to compare
wavelet filters. By using these wavelets and compression, we can achieve an optimum balance between the performance metrics like PSNR and Compression Ratio and reduces the Mean Square Error. Our results provide better results in terms of computation time and PSNR ratio.

Reference


Index Terms

Electronics Multimedia Communication

Key words

Component

DWT

EEWTA

Spartan 3E FPGA