Abstract

A robust and an efficient source and channel coding algorithms is proposed in this paper for the purpose of progressive transmission of images over wireless communication systems. This paper presents a modified orthogonal frequency division multiplexing system for robust progressive image transmission. A joint source channel coder is employed in the modified OFDM system. The set Partioning hierarchical trees (SPIHT) used as source code and low density parity check code used as channel coder. The input image is applied with discrete wavelet transforms, by using an wavelet type of biorthogonal wavelet family, in turn then the SPIHT algorithm is applied for the further process, while decoding an IDWT is applied for the
reconstruction of the image. The modified OFDM system includes an adaptive clipping technique as a peak to average power ratio reduction technique for the OFDM signal. This proposed PAPR reduction technique is based on adaptive clipping for the amplitude of the input signal, where each of the signals related to the different four groups of the modified SPIHT coder is clipped with a different clipping level according to the group sensitivity, also this work is carried on a 1024*1024 image. Finally this paper demonstrates the efficiency of the modified OFDM system with proposed PAPR reduction technique, when compared with a normal OFDM system without the adaptive clipping technique, and also a CCDF (complementary Cumulative Distributive function) comparison of PAPR is done for the modified OFDM system with and without adaptive clipping over AWGN with QPSK and QAM16 modulation technique. The simulation results are presented based on bit error rate (BER), the peak signal to noise ratio (PSNR) and PAPR over AWGN channel. Based on the simulation results, the proposed structure provides a significant improvement in BER and PSNR performances and a reduction in PAPR is achieved.

References

- Junqing Liu, Dangui Xie, Shuifa Sun, "Progressive imagetransmission based on joint source channel distortion model," International Conference on Computer Application and System Modeling (ICCASM 2010)
PAPR Reduction using OFDM Technique with Rate and Power Allocation Employed with JSCC Coding Technique


Index Terms

Computer Science

Signal Processing

Keywords

Ofdm Papr Spiht Wavelet Biorthogonal Ccdf Ldpc Unequal Error Protection (uep) Awgn Channel.