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Abstract
With the improvement of the science and technology, the usage digital image is more popular and convenient in the recent years. To lower the amount of transmitted image data, low-bit-rate compression is then necessary in image transmission and storage. There are several techniques of image coding being mentioned so far, and among them, the wavelet transform offers the best way in image coding. Wavelet transform can be considered as a multi-resolution signal analysis, which decomposes a signal into its components in different frequency bands. On the basis of wavelet transform, the embedded zerotree wavelet (EZW) is widely used in the image compression. The EZW compression technique provides several superior properties like progressive, coding-length-control, and fault tolerance such that it can be applied for real-time compression systems.
Nevertheless, the conventional progressive image coding notoriously is costly and memory-consuming. The paper proposes that Embedded Zreotree Wavelet algorithm and the architecture of the modified EZW algorithm will have the property of regularity, modularity, and Scalability, and also possess the function. The modified EZW architecture needs less memory units than the original one, and functionality as effective as the original architecture. The design has been synthesized on Synopsys Design Compiler with the standard cell from UMC 0.18um cell library. Finally, the layout for the design was generated with the Avant! tools, Apollo (for floorplan, placement and routing). It core size and gate count are about 1173×1109 mm2 and 3545, respectively Modified EZW Encoder for 256×256 image size. The critical path delay is only 2.1427 ns, leading to an operating frequency of more than 400MHz.
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