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RESEARCH ARTICLE

IMPLEMENTATION FOR 3-D DISCRETE WAVELET TRANSFORM BY USING EFFICIENT ARCHITECTURE

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Abstract- The digital data can be transformed using Discrete Wavelet Transform (DWT). The images need to be transformed without losing of information. The Discrete Wavelet Transform (DWT) was based on time-scale representation, which provides efficient multi-resolution. The lifting based scheme (5, 3) (Here 5 Low Pass filter coefficients and the 3 High Pass filter coefficients) filter give lossless mode of information as per the JPEG 2000 Standard. The lifting based DWT are lower computational complexity and reduced memory requirements. Since Conventional convolution based DWT is area and power hungry which can be overcome by using the lifting based scheme.

The discrete wavelet transform (DWT) is being increasingly used for image coding. This is due to the fact that DWT supports features like progressive image transmission (by quality, by resolution), ease of transformed image manipulation, region of interest coding, etc. DWT has traditionally been implemented by convolution. Such an implementation demands both a large number of computations and a large storage features that are not desirable for either high-speed or low-power applications. Recently, a lifting-based scheme that often requires far fewer computations has been proposed for the DWT. In this work, the design of Lossless 3-D DWT (Discrete Wavelet Transform) using Lifting Scheme Architecture will be modeled using the Verilog HDL and its functionality were verified using the Model sim tool and can be synthesized using the Xilinx tool.

Keywords – Discrete wavelet transform; image compression, lifting; video; VLSI architecture

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