AN EFFICIENT ARCHITECTURE FOR LIFTING–BASED FORWARD AND INVERSE DISCRETE WAVELET TRANSFORM (FriAmOR3)

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Abstract :
In this paper, we propose an architecture that performs both forward and inverse lifting–based discrete wavelet transform. Our architecture reduces the hardware requirement by exploiting the redundancy in the arithmetic operation involved in DWT computation. The proposed architecture does not require any extra memory to store intermediate results. The proposed architecture consists of predict module, update module, address generation module, control unit and set of registers to establish data communication between predict and update modules. The symmetrical extension of images at the boundary to reduce distorted images has been incorporated in our proposed architecture as mentioned in JPEG2000. This architecture has been described in VHDL at the RTL level and simulated successfully using ModelSim simulation environment.