A VLSI ALGORITHM FOR 2-D DCT USING PARALLEL CIRCULAR AND PSEUDO-CIRCULAR CORRELATION STRUCTURES

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Abstract. A new VLSI algorithm, that uses circular correlation and pseudo-circular correlation structures, is proposed. It can be efficiently used for the VLSI implementation of the 2-D DCT based on the systolic array paradigm. It can be shown that this VLSI algorithm can be used with an appropriate design approach that is based on the advantages of circular correlation and pseudo-circular correlation computational structures. Thus, the proposed algorithm can be mapped on a linear systolic array. High computing speed can be obtained with a low I/O cost characterized by a small number of I/O channels. The resulted architecture that can be obtained with the proposed algorithm is highly modular and regular with local connections being well suited for the VLSI implementation.

Key words: VLSI algorithms; VLSI architectures; systolic arrays; DCT transform.