**A GENERALIZED ALGORITHM AND RECONFIGURABLE ARCHITECTURE FOR EFFICIENT AND SCALABLE ORTHOGONAL APPROXIMATION OF DCT**

**Abstract:**

This proposed paper presents architecture of generalized recursive function to generate approximation of orthogonal function DCT with an approximate length N could be derived from a pair of DCTs of length (N/2) at the cost of N additions for input preprocessing. Approximation of DCT is useful for reducing its computational complexity without impact on its coding performance. Most of the existing design for approximation of the DCT target only the small transform lengths DCT, and some of them are non-orthogonal. Proposed method is highly scalable for hardware and software implementation of DCT of higher lengths, and it can make use of the present approximation of 8-point DCT to obtain DCT approximation of any power of two length, N>8. It is shown that proposed design involves lower arithmetic complexity compared with the other existing design. One uniquely interesting feature of the proposed method is that it could be composed for the calculation of a 32-point DCT or for parallel calculation of two 16-point DCTs or four 8-point DCTs. The proposed method is found to offer many advantages in terms of hardware regularity, modularity and complexity. The design is implemented in Xillinx IES 10.1 design suite and synthesized using Cadence Encounter.

**Keywords:** Algorithm-Architecture Codesign, DCT Approximation, Discrete Cosine Transform (DCT), High Efficiency Video Coding (HEVC).

**TOOLS:**

1. **XilinxISE 14.7**

**LANGUAGE:**

1. **VerilogHDL**