

Analysis and Implementation of Image Compression Approach Inexact Computing

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Abstract: *This study proposes a novel approach for digital image processing, specifically targeting the issue of inaccurate calculations in discrete cosine transformation (DCT) compression. The technique aims to address and resolve certain difficulties related with DCT compression. The proposed system consists of three processing stages. In the first step, an approximated Discrete Cosine Transform (DCT) is used for picture compression. This eliminates the need for computationally demanding floating-point multiplication and instead utilizes integer additions and, in some cases, logical right/left shifts for DCT processing. The second level further reduces the amount of data (from the first level) that has to be processed by isolating the frequencies that are imperceptible to human senses. Ultimately, the third stage includes flawed circuit level adders to calculate the DCT, with the intention of reducing power use and delay. The suggested three-level method is used to compress a collection of structured photographs for measurement. The study compares many performance indicators, including energy consumption, delay, power-signal-to-noise ratio, average difference, and absolute maximum difference, with current compression techniques. Additionally, an error analysis is conducted to validate the simulation findings. The results demonstrate significant improvements in energy and time reduction, while simultaneously retaining acceptable levels of accuracy for image processing applications.*

Keywords: Approximate computing, DCT, inexact computing, image compression