Technology Licensing Opportunity

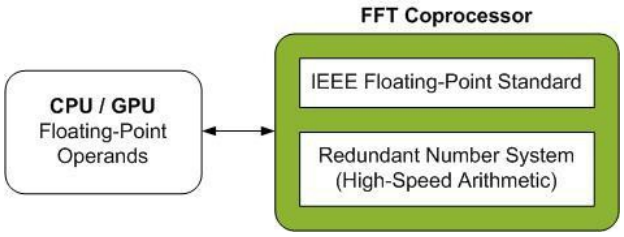
UNIVERSITY OF SASKATCHEWAN

REDUNDANT FLOATING POINT FAST FOURIER TRANSFORM (FFT) COPROCESSOR

Invention:

High-speed real-time multimedia services, such as high-definition video streaming through wireless communication systems require FFT IP cores. This core consists of many consecutive multiplications and additions over complex numbers. Most of FFT architectures have been using fixed-point arithmetic, until recently that FFTs based on floating-point operations grow.

The demand for high-speed real-time multimedia services, such as high-definition video streaming through wireless communication systems, has increased in the last decade This has led to a change on standard for wireless personal area networks to meet the application demands, wherein the orthogonal frequency division multiplexing (OFDM) is the most common modulation scheme. Given that Fast Fourier Transform (FFT) has a significant impact on the performance of OFDM-based communication systems, improvements on FFT are of paramount importance



Applications:

This technology is beneficial in embedded systems for

1. Signal Processing
2. Wireless Multimedia Services

Advantages over existing Technology:

Advantages of floating-point (FP) over fixed-point arithmetic are

- Wide dynamic range of floating-point dismisses scaling and over/under flow concerns
- FFT coprocessor can be used in collaboration with all general-purpose processors.

This invention introduces the following features to FFT processors applicable to signal processing units and wireless multimedia services.

- Compatibility with all general purpose processors
- Offloading compute-intensive tasks from the processors and hence higher performance
- Very fast FP FFT coprocessor due to use of redundant number systems.

Preliminary evaluations show that the proposed FFT coprocessor is about twice faster than the fastest previous work.

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