MAS WES 268

Projet 4: FFT

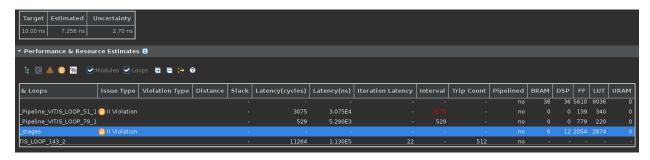
Rajan Verma

Initial:

Hardware implementation – First:

Github Path: project4/FFT/HLS/2 Skeleton Restructured

Report: project4/FFT/HLS/2_Skeleton_Restructured/fft_hardware_1/solution1/syn/report



Throughput: 45.9 Mega Samples/second

Architecture explanation:

Starting with Bit reversal, here both real and imaginary parts, so we go through all th indices and swap the elements. And this is required so that the data is in order for butterflies computations.

for the first layer I use the unity twiddle factor (these come from give W* arrays). This stage performs pairwise computations also called butterlies for entire dataset. , we also calculate sum and differences of pairs.

For the middle stages, again butterflies are calculates. and this is for 2 to logN-1 (log base2).

The function calculates the number of points in each sub DFTs and iterates for maths.

For final stage processes entire dataset with twiddle factos and completed the transportion of time to frequency domain.

Github: project4/FFT/HLS/2_Skeleton_Restructured_optimized

When I try to use Pragmas, loop unrolling and other techniques, testbench fails:

OFDM:

I updated some code in qpsk_decode, updated fft.h though its still failing for compilation. so need to further work on this.