

Measuring Execution time and Energy Consumption of Algorithms on Embedded Processors

FPGA vendors often provide embedded processors on modern FPGA-boards which enables software-hardware codesign much easier. Most of the time, these embedded processors are used to execute software algorithms while FPGA fabric is used to implement hardware logic. One of the most important parameter to know the efficiency of the software algorithm is its execution time and the energy requirement.

In this assignment student will write a 16 or 32-bit multiply–accumulate operation (MAC) operation in MATLAB. MAC is a very common operation in digital-signal processing that computes the product of two numbers and adds that product to an accumulator. Afterwards, the student will convert this algorithm to C-Language and determine its execution time on ARM CORTEX 9 core on the Zedboard. The assignment requires exploring different ways to determine the execution time. Comparison of results obtained by different methods can then be done to conclude which method is more accurate. On-board power measurements can be done to determine the energy consumption as well.