

University of Pennsylvania
Department of Electrical and System Engineering
System-on-a-Chip Architecture

ESE532, Fall 2020

200Mb/s Milestone

Wednesday, November 18

Due: Friday, December 4, 5:00PM**Group:** Achieve target speed and writeup progress (Items 1, 2, 3)

1. Accelerate your deduplication and compression task; try to achieve 200 Mb/s overall performance.
 - (a) Report throughput achieved. Include details on the throughput supported by each major operation as well as the overall throughput.
 - (b) Report current compression rate achieved.
 - (c) Describe all validation performed on your accelerated implementation.
 - (d) Identify where this design is in your design space. Explain additional design-space axes beyond your previous milestone as necessary.
 - (e) Describe the techniques you used to achieve the speedup. Be clear where each component runs and the resources it uses.
 - (f) Support your description with a performance model.
 - (g) Describe who did what.
2. Turn in a tar file for your code above to the designated assignment component in canvas (one per group).
3. Turn in a tar or zip file with binaries to support execution of your code to the designated assignment component in canvas (one per group).
 - (a) `encoder.xclbin`, `BOOT.bin`, `boot.scr`, `image.ub` for FPGA kernel
 - (b) `encoder` for OpenCL host code executable
 - (c) `decoder` executable configured to work with your encoded file and that can be run on the Ultra96. (Most likely, this is just a compilation of the `Decoder.cpp` we supplied; however, if you chose a different maximum block size, you may need to change `CODE_LENGTH`; so give us back one with that change made.)
Make sure to compile it with the `aarch64-linux-gnu-g++` compiler and test it on the Ultra96. While you could run the decoder on your host machine (which could be Linux/Mac OS/Windows), we will run your decoder on the Ultra96.