ECEC-413: Introduction to Parallel Computer Architecture
CUDA Programming Lab 4: Stream Compaction

Prof. Naga Kandasamy, ECE Department, Drexel University

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The Lab is due December 5, 2011. You may work on the assignment in teams of up to two people.

Edit the source files `compact_stream.cu` and `compact_stream_kernel.cu` to complete the functionality of stream compaction on the GPU using prefix scan. Specifically, you are provided with an array (or stream) comprising both positive and negative numbers, and you are asked to filter out only positive values greater than zero and store these values in the compacted stream. A paper on how to implement prefix scan on the GPU is available at `http://http.developer.nvidia.com/GPUGems3/gpugems3_ch39.html`. The `compact_stream_kernel.cu` file contains an implementation of the scan algorithm detailed in Fig. 39.2.2 of the paper. Please use the kernel as a building block for stream compaction and add additional kernels as necessary. Section 39.3.1 of the paper discusses how to use prefix scan for compacting a stream.

- Assume a default stream size of 512 elements. Your program should accept no arguments. The CPU implementation of the stream compaction algorithm will be used to generate a correct solution which will be compared with your GPU program's output. If the solutions match within a certain tolerance, if will print out "Test PASSED" to the screen before exiting.
- E-mail me all of the files needed to compile and run your code as a single zip file. Also, attach a short report detailing the design and implementation of your program.