De La Salle University, Manila
Computer Technology Department

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CEPARCO

GPU CUDA and Other Feature:
DOT PRODUCT PROGRAM USING SHARED MEMORY

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Execution Time

The following tables shows the average execution time of the dot product program using (1) a C++ program version (2) CUDA program WITHOUT shared memory using grid-stride loop with prefetching+mem advise and (3) CUDA program using shared memory using grid-stride loop with prefetching+mem advise.

C++ Program	**Average Execution Time (30 runs)**
2^{20}	3.490 ms
2^{22}	13.282 ms
2^{24}	51.712 ms

Average Execution Time of the C++ Dot Program Code

CUDA w/o shared memory using grid-stride loop with prefetching+mem advise	**256** Threads per block	**512** Threads per block	**1024** Threads per block
2^{20}	921.742 ms	923.635 ms	913.810 ms
2^{22}	3560 ms	3580 ms	3570 ms
2^{24}	14189 ms	14163 ms	14091 ms

Average Execution time for CUDA w/o shared memory using grid-stride loop with prefetching+mem advise, runs 30 times each test case.

CUDA with shared memory using grid-stride loop with prefetching+mem advise	**256** Threads per block	**512** Threads per block	**1024** Threads per block
2^{20}	4.178 ms	2.138 ms	1.086 ms
2^{22}	16.595ms	8.087 ms	4.220 ms
2^{24}	64.587 ms	32.286 ms	15.986 ms

Average Execution time for CUDA with shared memory using grid-stride loop with prefetching+mem advise, runs 30 times each test case.