



INDIAN INSTITUTE OF TECHNOLOGY GANDHINAGAR

ES-611: Algorithms on Advanced Computer Architecture
MPI Interfacing for Code Parallelization

Lab 3: Introduction to Compute Unified Device Architecture (CUDA)

Team Members

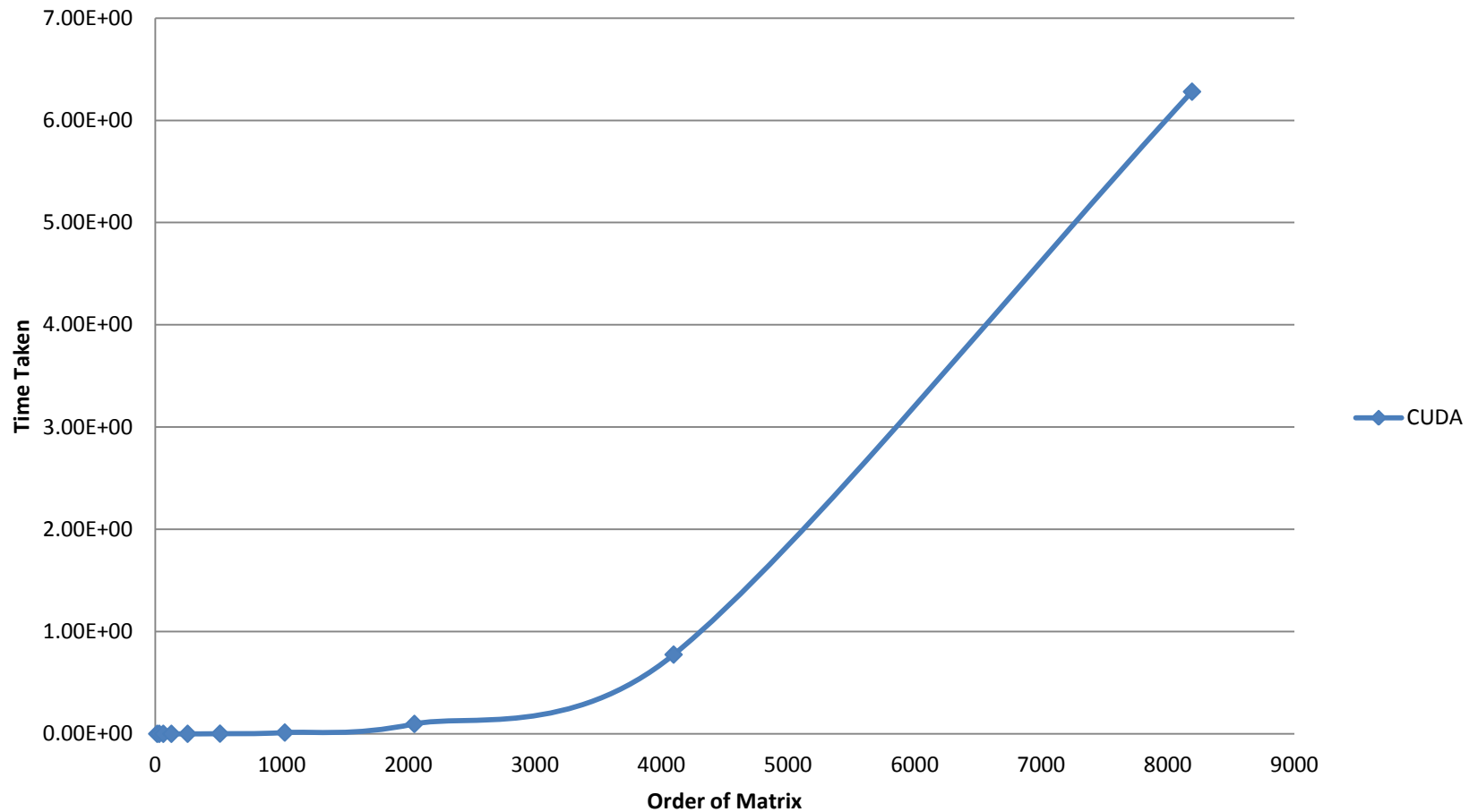
Nishant N. Rao 11110059

Ravi Kumar 11110081

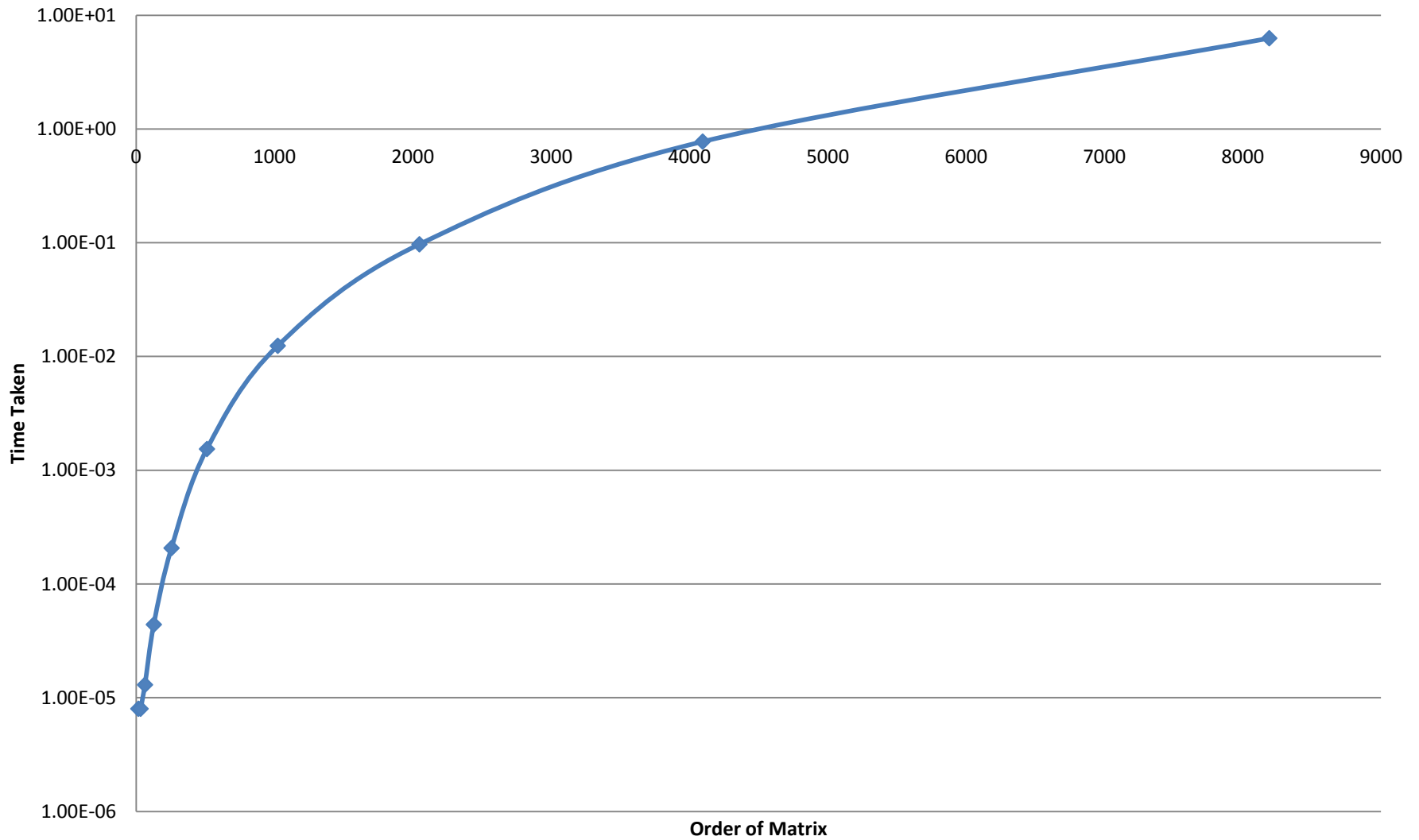
Parth Gudhka 11110062

Shashank Heda 11110094

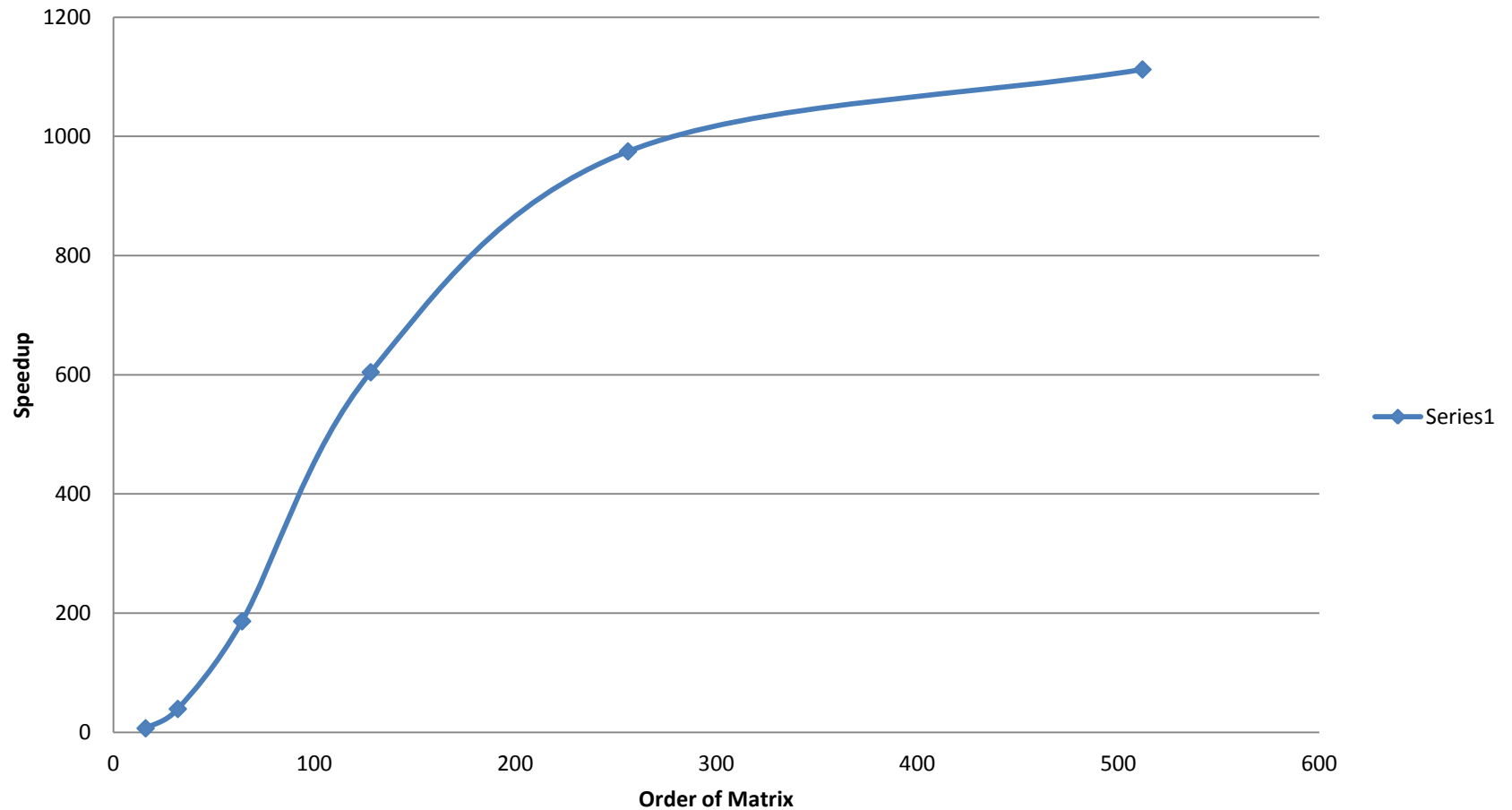
CUDA Matrix-Matrix Multiplication



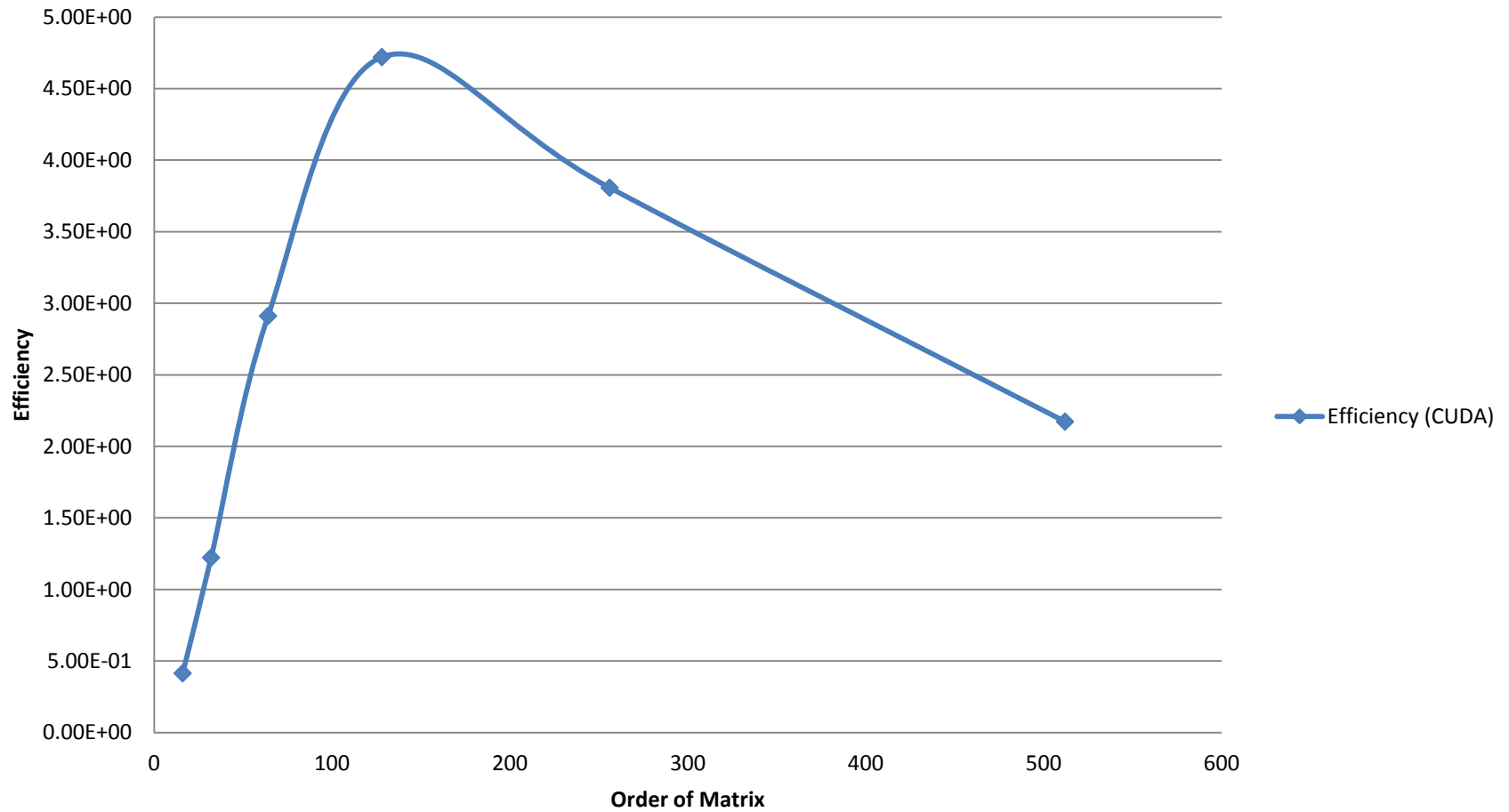
CUDA Matrix-Matrix Multiplication (Log Scale)



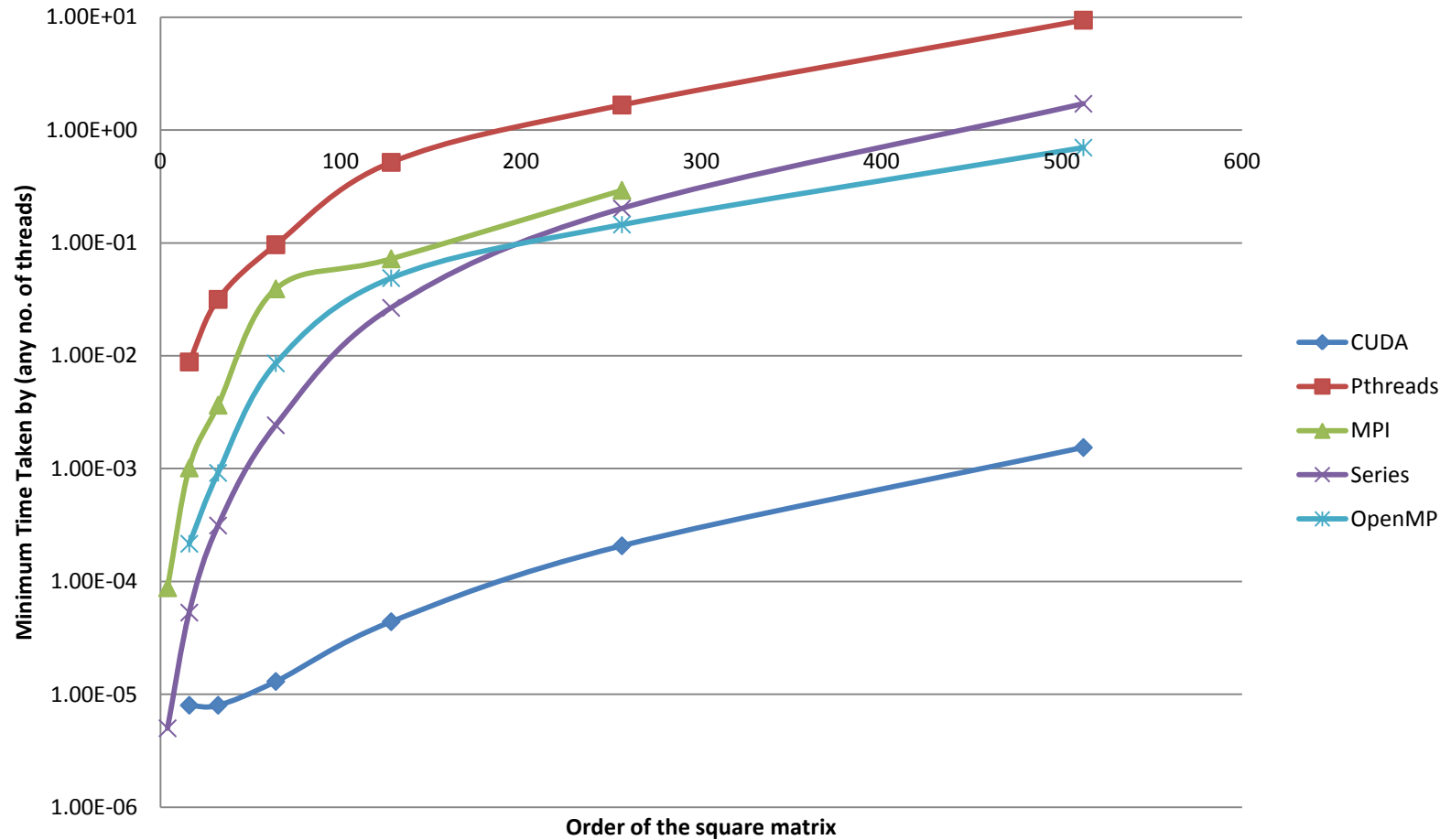
Speedup (CUDA)

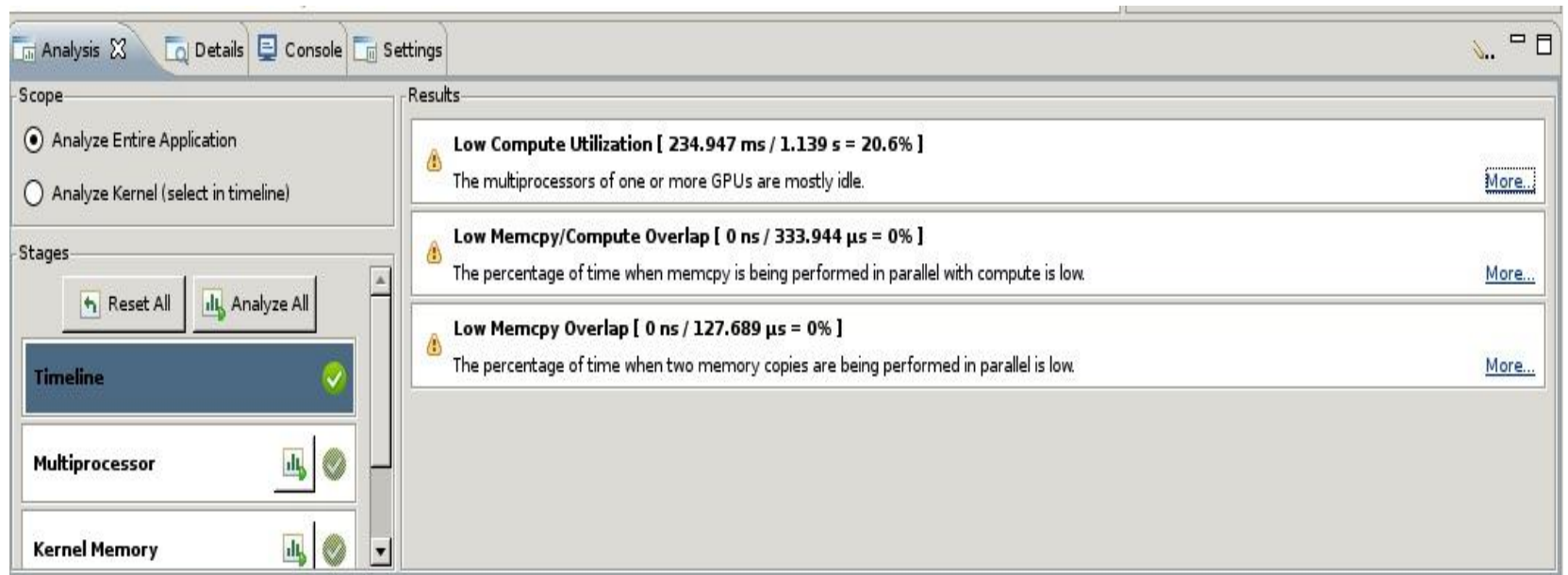


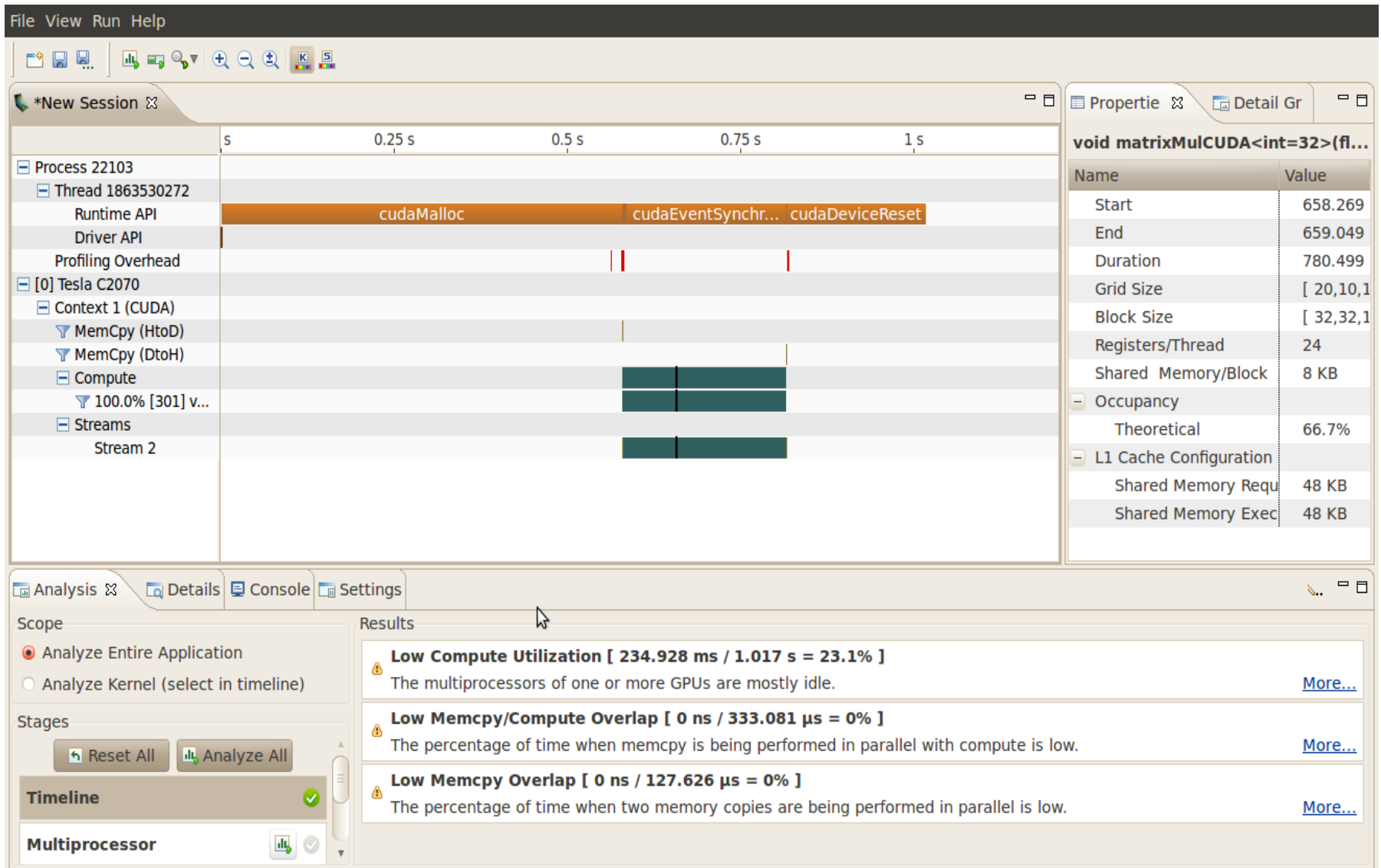
Efficiency (CUDA)



Comparison between minimum timing obtained for various cases

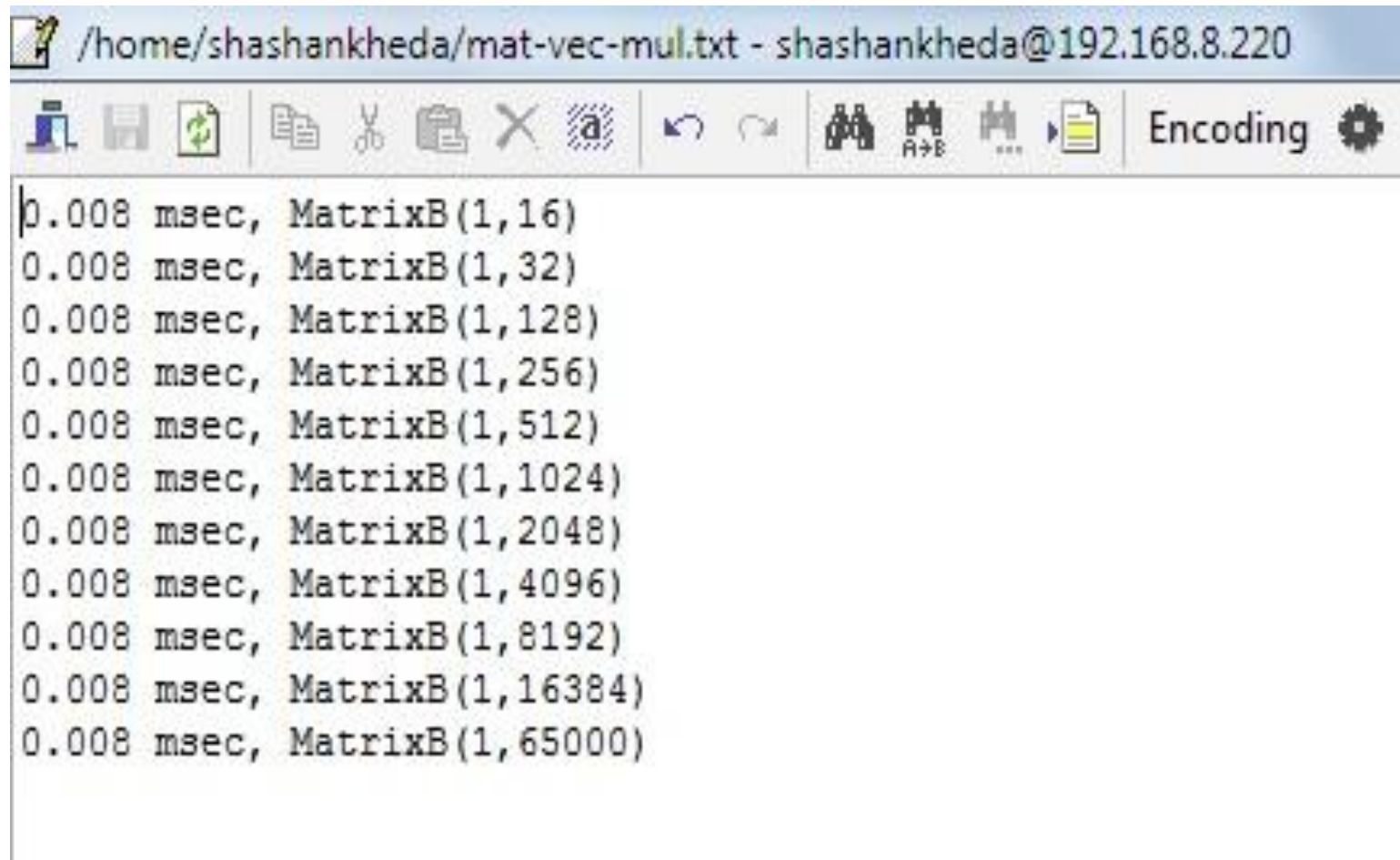






Observations related to Ping Pong

- Ping Pong with GPUs
- Meaningful??
- Device1 -> Host1 -> Host2 -> Device2
- Memory Bandwidth (GPU – Internal) ~ 144 GBps
- Memory Bandwidth (GPU – CPU) ~ 5 GBps
- Memory Bandwidth (Node1 – Node2) -> 125 MBps



The screenshot shows a terminal window with a title bar indicating the file path `/home/shashankheda/mat-vec-mul.txt` and the user `shashankheda@192.168.8.220`. The terminal contains a list of matrix multiplication operations, each preceded by a time measurement of `0.008 msec`. The operations are as follows:

Operation
<code>MatrixB(1,16)</code>
<code>MatrixB(1,32)</code>
<code>MatrixB(1,128)</code>
<code>MatrixB(1,256)</code>
<code>MatrixB(1,512)</code>
<code>MatrixB(1,1024)</code>
<code>MatrixB(1,2048)</code>
<code>MatrixB(1,4096)</code>
<code>MatrixB(1,8192)</code>
<code>MatrixB(1,16384)</code>
<code>MatrixB(1,65000)</code>

Thank You