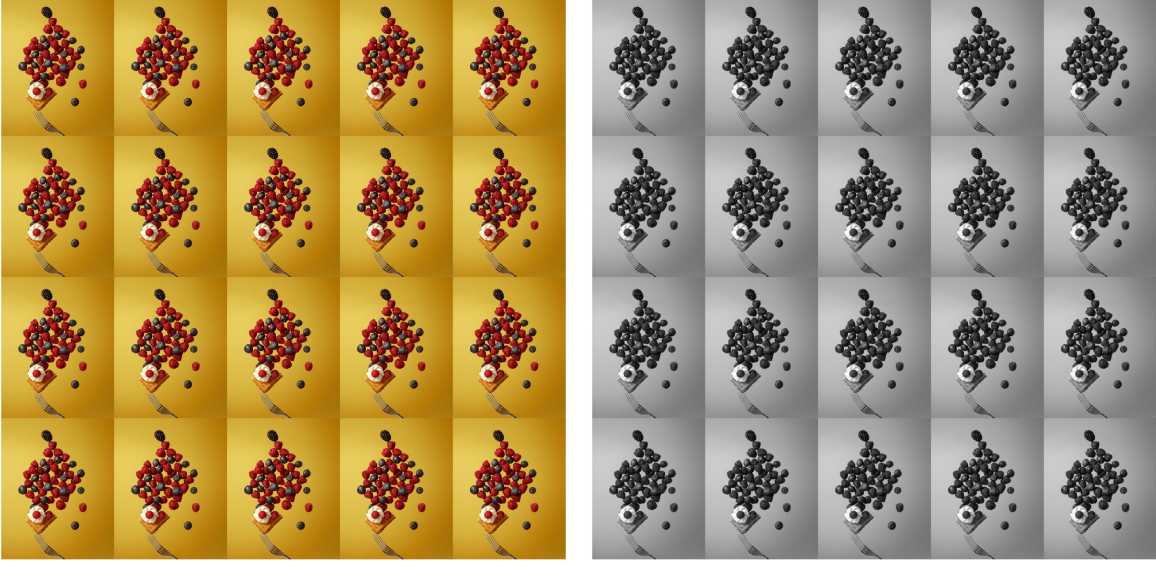


Image Greyscale Benchmark Results

Input Image

- Image dimensions (pixels): 28000x28000 (FHD == 1920x1080)



- Image size (bytes): 119,828,615

Hardware/Software Specifications

Hardware

CPU

CPU: Info: Quad Core  
model: Intel Core i7-4790K  
bits: 64  
type: MT MCP  
arch: Haswell  
rev: 3  
cache:  
L2: 8 MiB  
flags: avx avx2 lm nx pae sse sse2 sse3 sse4\_1 sse4\_2 ssse3 vmx  
bogomips: 63873  
Speed: 4333 MHz  
min/max: 800/4400 MHz  
Core speeds (MHz):  
1: 4333 2: 4043 3: 4323 4: 4126  
5: 4346 6: 4282 7: 4277 8: 4339

RAM

Memory: RAM: total: 11.54 GiB  
Array-1: capacity: 32 GiB  
slots: 4  
EC: None  
max-module-size: 8 GiB  
note: est.  
Device-1: ChannelA-DIMM0 size: No Module Installed  
Device-2: ChannelA-DIMM1 size: 4 GiB speed: 1333 MT/s type: DDR3  
Device-3: ChannelB-DIMM0 size: No Module Installed  
Device-4: ChannelB-DIMM1 size: 8 GiB speed: 1333 MT/s type: DDR3

CUDA

CUDA Device Query (Runtime API) version (CUDA static linking)

Detected 1 CUDA Capable device(s)

Device 0:  
CUDA Driver Version / Runtime Version 11.3 / 11.3  
CUDA Capability Major/Minor version number: 5.0  
Total amount of global memory: 3998 MBytes (4192337920 bytes)  
(005) Multiprocessors, (128) CUDA Cores/MP: 640 CUDA Cores  
GPU Max Clock rate: 1110 MHz (1.11 GHz)  
Memory Clock rate: 2700 Mhz  
Memory Bus Width: 128-bit  
L2 Cache Size: 2097152 bytes  
Total amount of constant memory: 65536 bytes  
Total amount of shared memory per block: 49152 bytes  
Total shared memory per multiprocessor: 65536 bytes  
Total number of registers available per block: 65536  
Warp size: 32  
Maximum number of threads per multiprocessor: 2048  
Maximum number of threads per block: 1024  
Max dimension size of a thread block (x,y,z): (1024, 1024, 64)  
Max dimension size of a grid size (x,y,z): (2147483647, 65535, 65535)

deviceQuery  
CUDA Driver = CUDART  
CUDA Driver Version = 11.3  
CUDA Runtime Version = 11.3  
NumDevs = 1  
Result = PASS

Software

Operating System

Kernel: 5.12.14 x86\_64

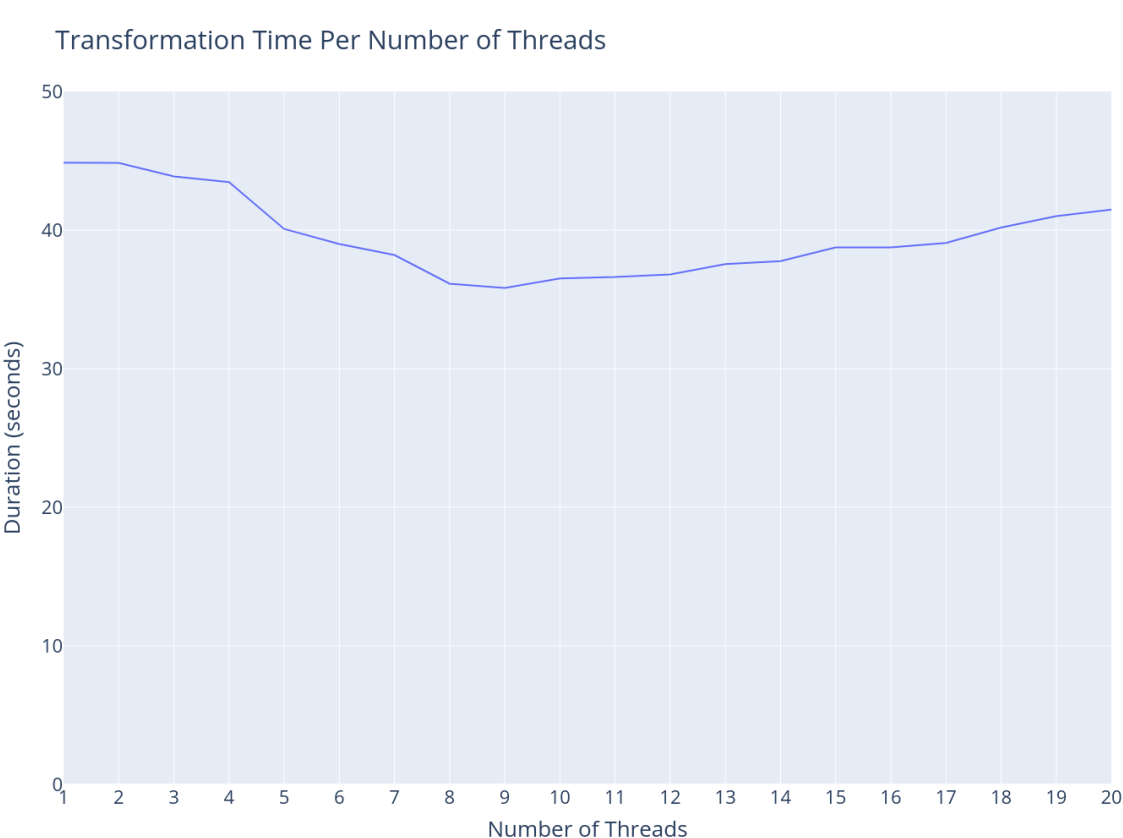
Compilers and Tools

- gcc:  
gcc (GCC) 11.1.0
- clang:  
clang version 12.0.1  
Target: x86\_64-pc-linux-gnu  
Thread model: posix
- cmake:  
cmake version 3.20.5

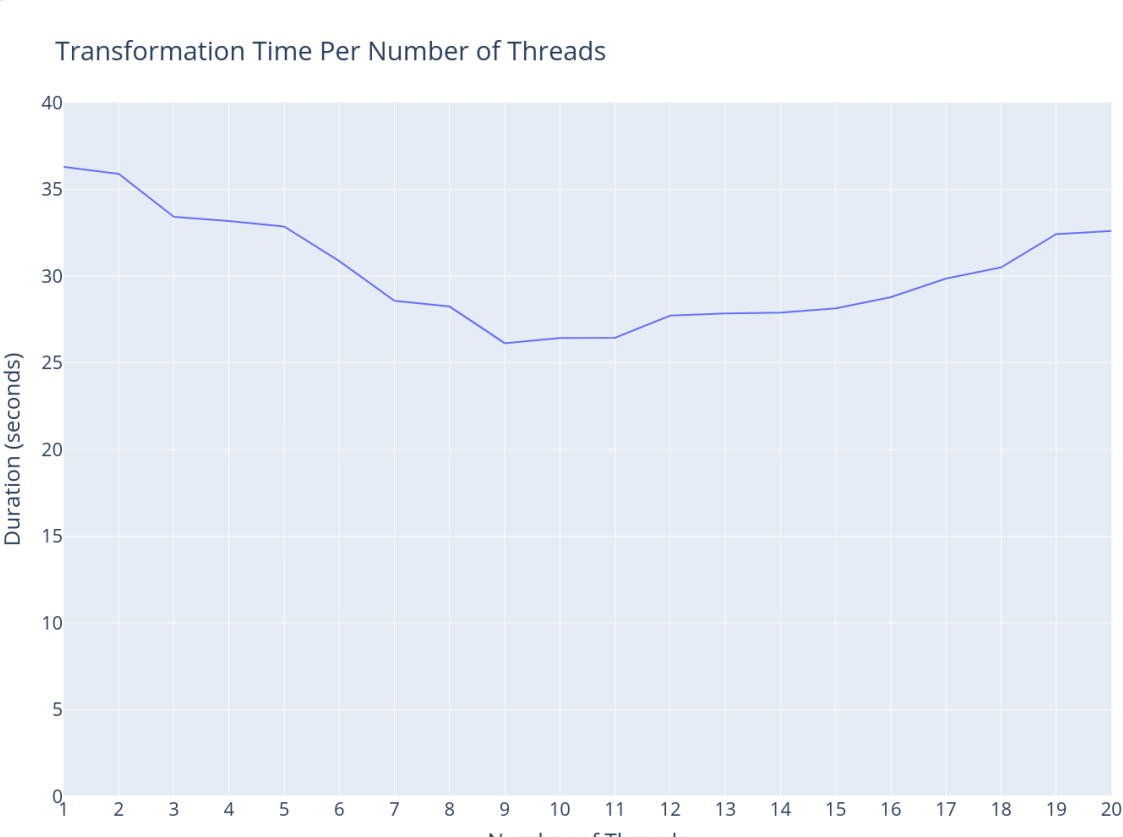
Results

Results are average of *only processing time* of executing the same implementation with different configuration parameters 2000 times:

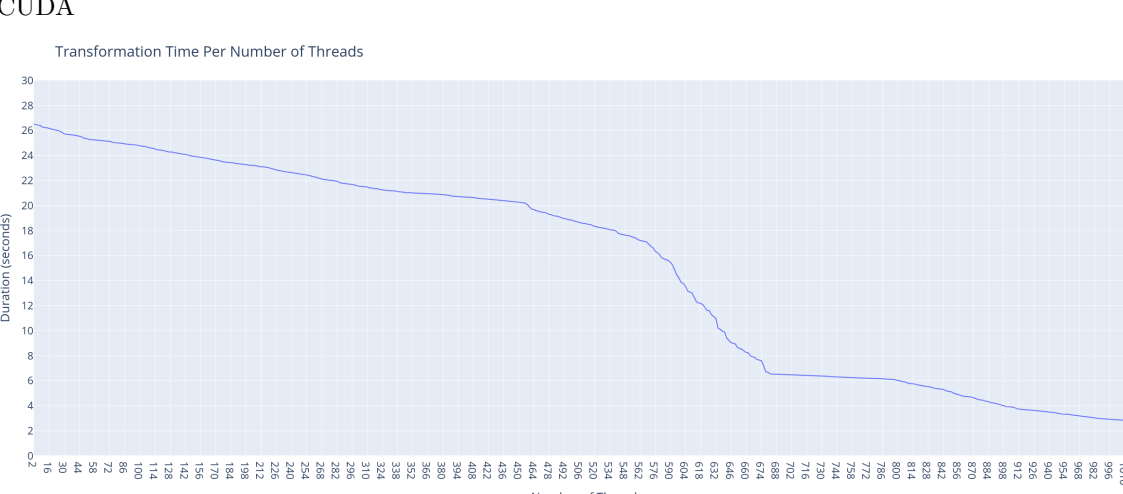
- OpenMP



- pthread



- CUDA



Speedup

The following is the best execution time of different parallelism model implementations compared in one view (+ single-threaded serial execution):

