GPU vs CPU

Michael Gopshtein

@michael_gop

migocpp

EYEWAY

ALL IS ILLUMINATED

The mental model

Translation errors

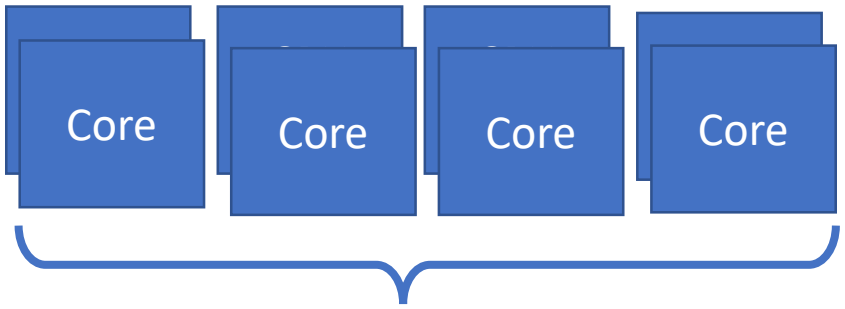
Intel(R) Core(TM) i7-6820HQ CPU @ 2.70GHz, 2712 Mhz, 4 Core(s), 8 Logical Processor(s)

Wow!!

640 >> 8

Items	Details	
Quadro M2000M	Driver version:	388.19
	Direct3D API version:	12
	Direct3D feature level:	11_0
	CUDA Cores:	640
	Graphics clock:	1098 MHz

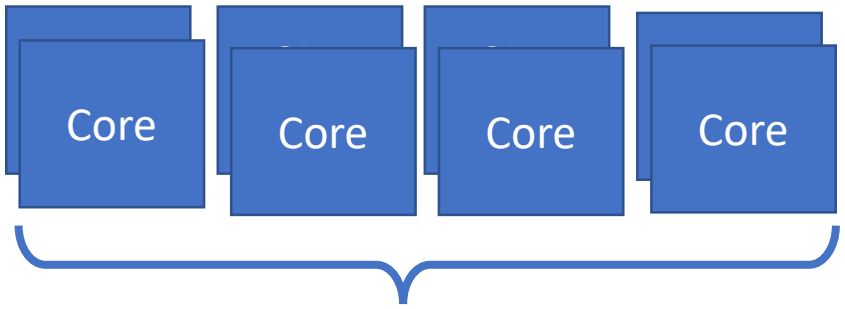
SIMD Perspective



2.7 Ghz

8 SIMD [AVX2 256-bit]

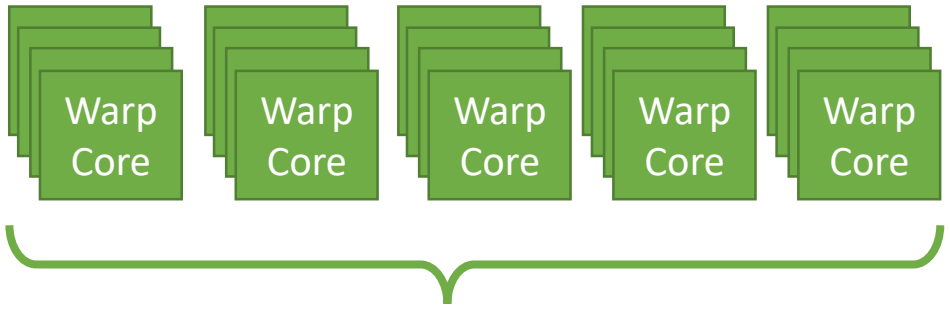
SIMD Perspective



8 Cores

2.7 Ghz

8 SIMD [AVX2 256-bit]

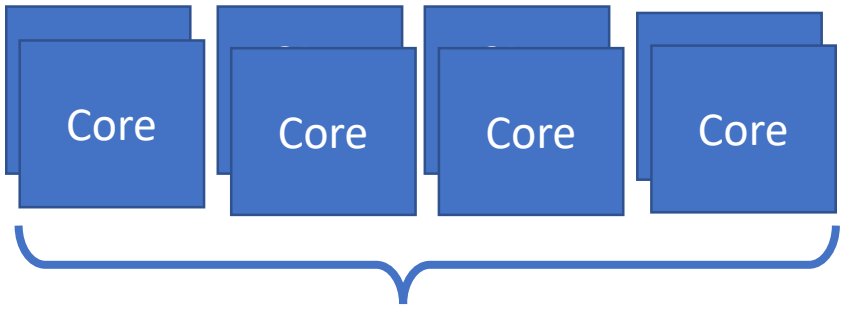


20 Cores

1.1 Ghz

32 SIMD *[warp]*

SIMD Perspective

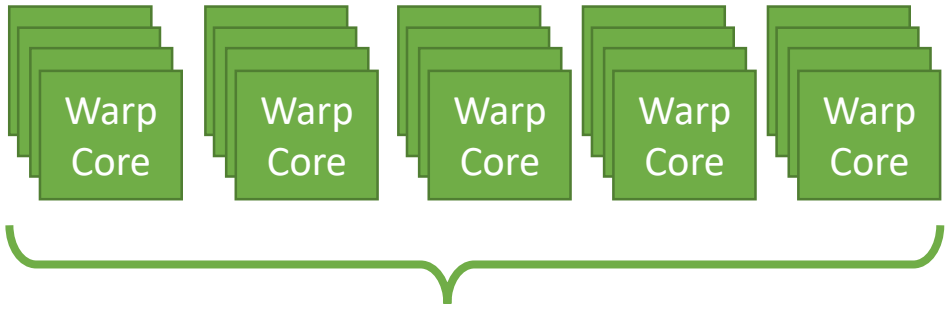


8 Cores

2.7 Ghz

8 SIMD [AVX2 256-bit]

170 GFLOPS (SIMD)



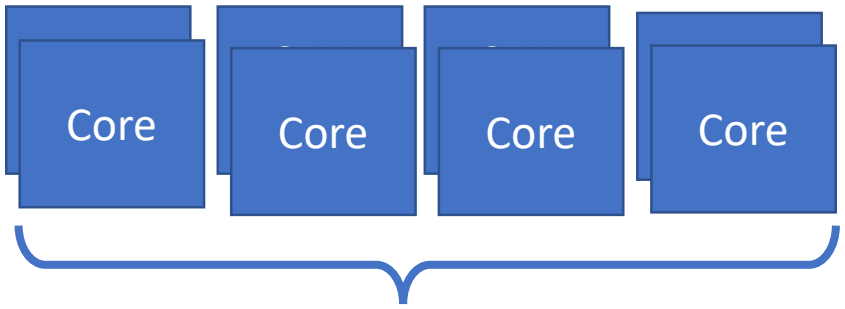
20 Cores

1.1 Ghz

32 SIMD *[warp]*

700 GFLOPS (SIMD)

SIMD Perspective



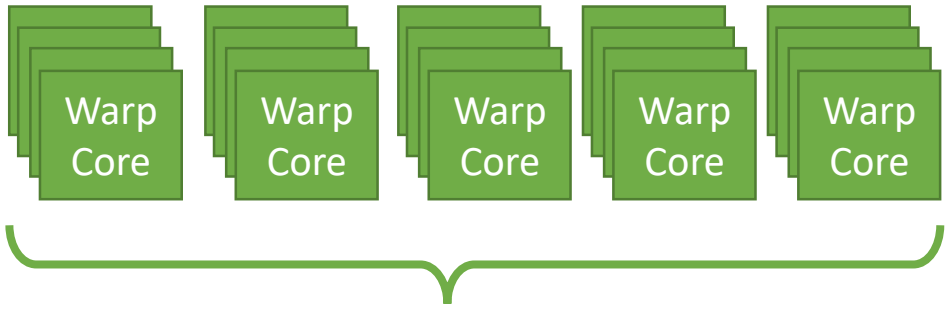
8 Cores

2.7 Ghz

8 SIMD [AVX2 256-bit]

170 GFLOPS (SIMD)

21.3 GFLOPS (single)



20 Cores

1.1 Ghz

32 SIMD *[warp]*

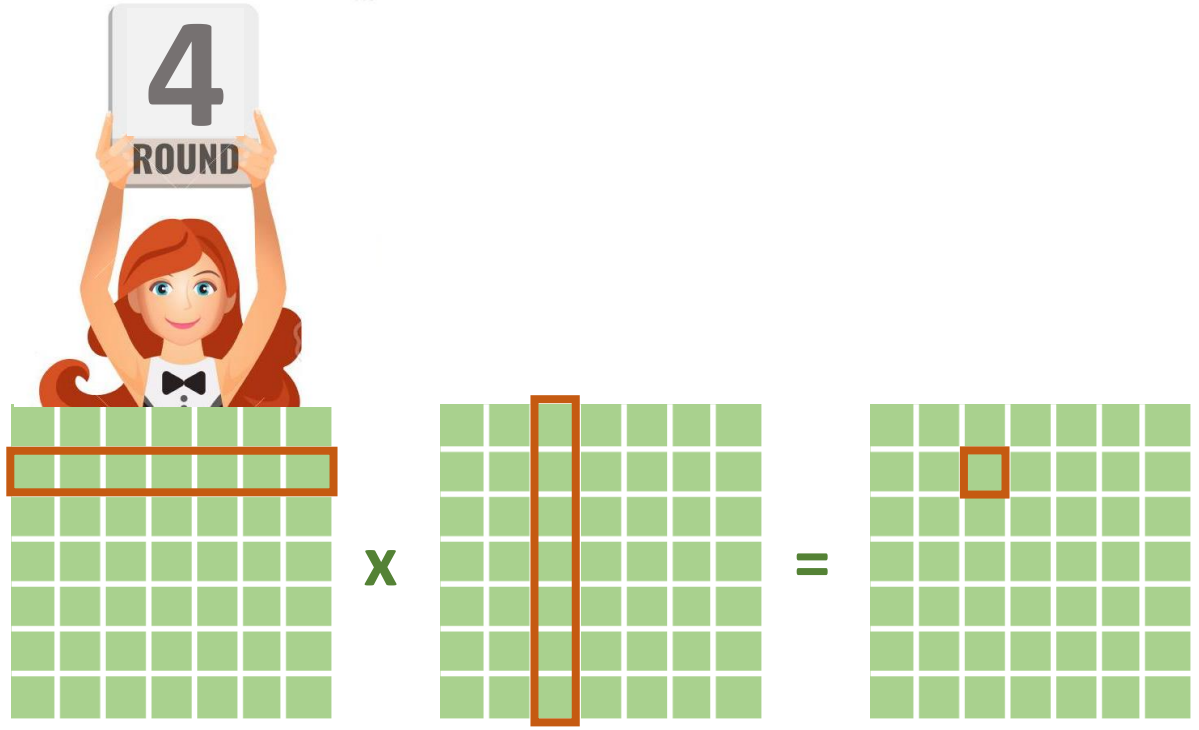
700 GFLOPS (SIMD)

21.9 GFLOPS (single)

Test Case

Multiply 2 matrices, NxN

$2N^3$ float operations

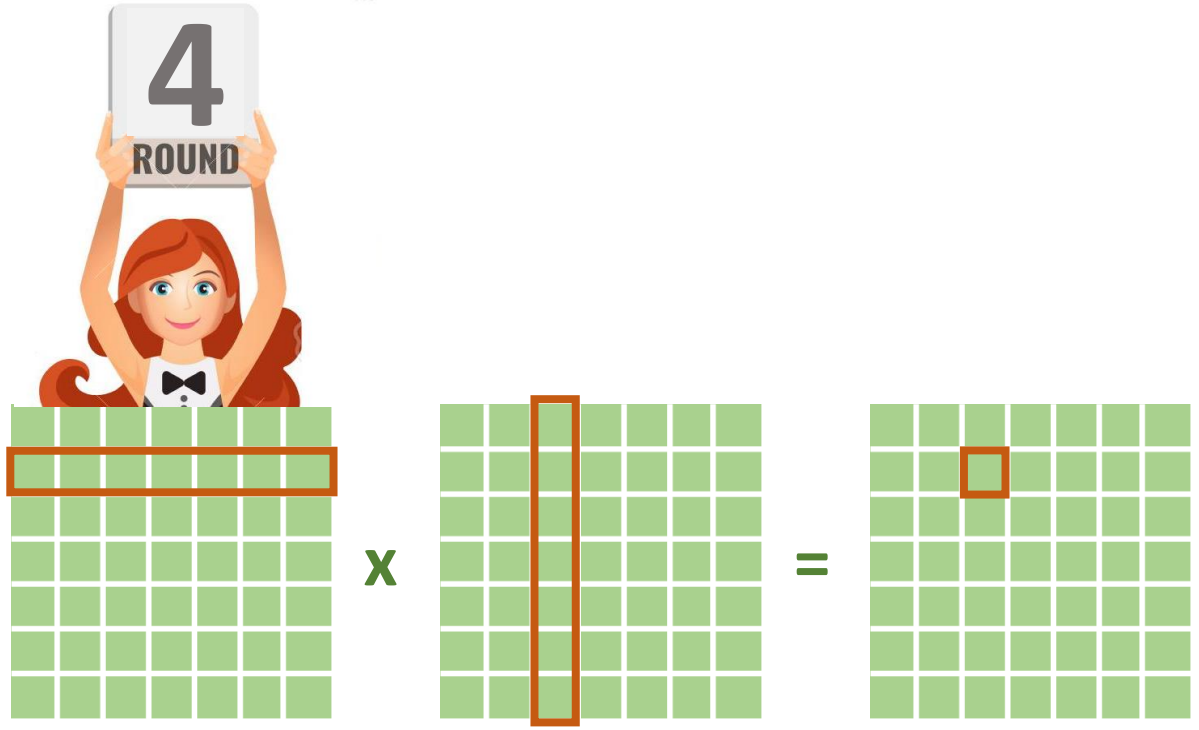


for N=1024	**Theoretical**
CPU	12.2 msec
GPU	3 msec

Test Case

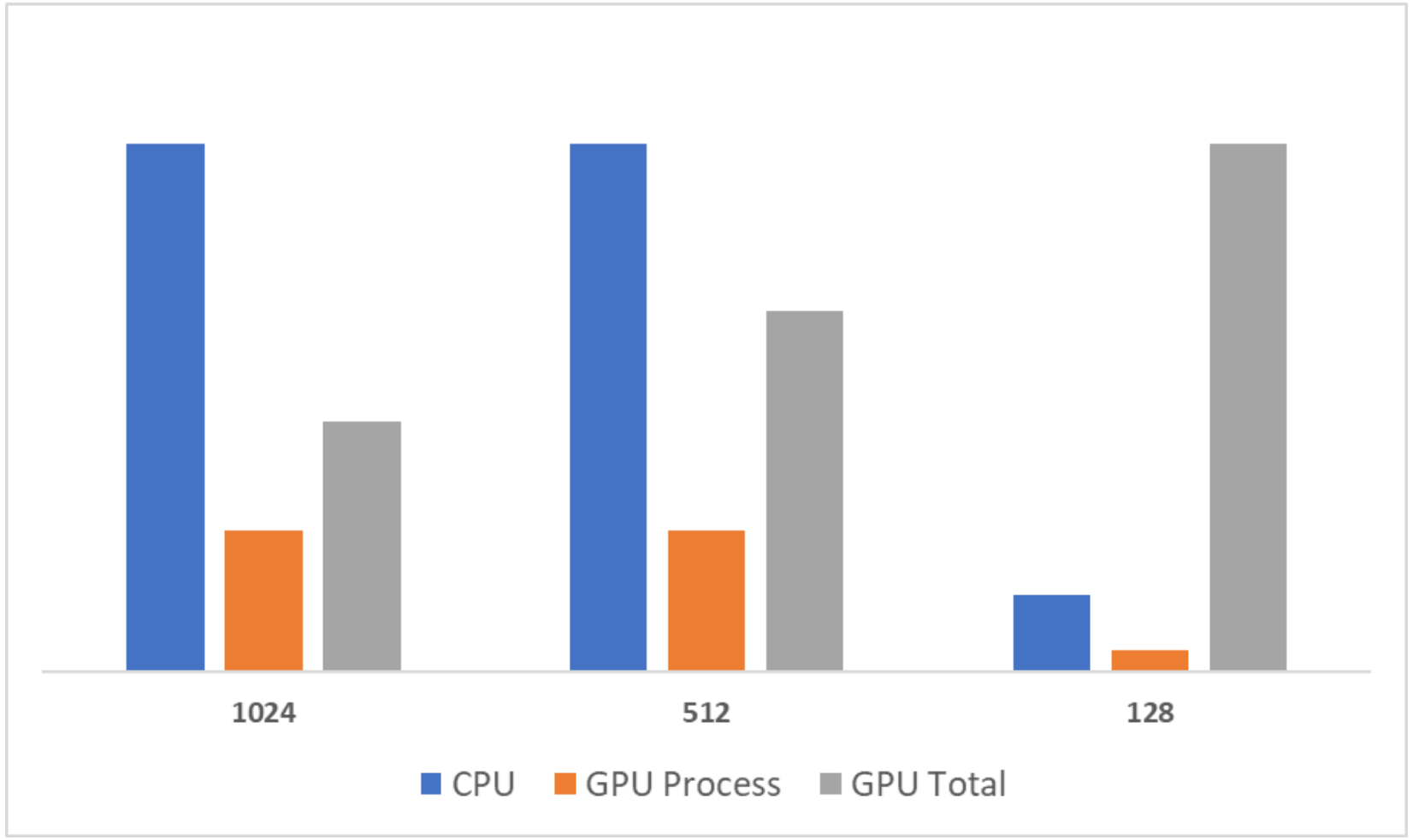
Multiply 2 matrices, NxN

$2N^3$ float operations

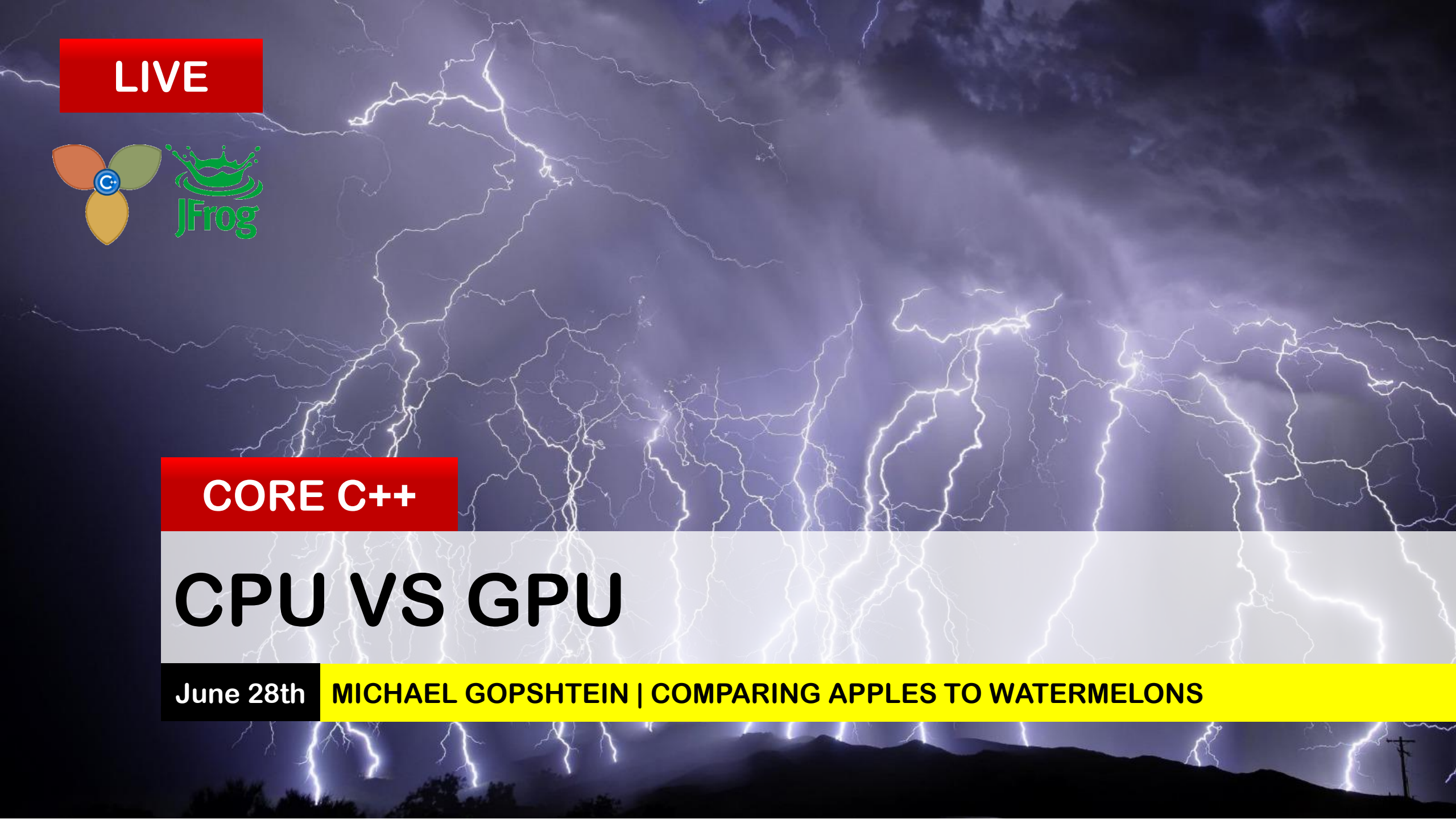


for N=1024	Theoretical	Measured	With Data Copy
CPU (Eigen + Intel MKL)	12.2 msec	**12** msec	---
GPU (cublas)	3 msec	**3.2** msec	5.7 msec

Test Case



Interpolated


LIVE
JFrog
CORE C++
CPU VS GPU
June 28th
MICHAEL GOPSHTEIN | COMPARING APPLES TO WATERMELONS