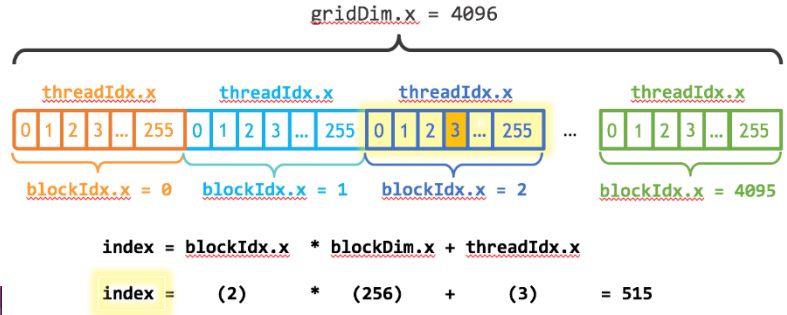
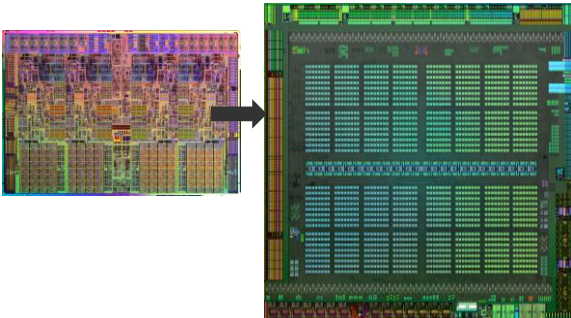


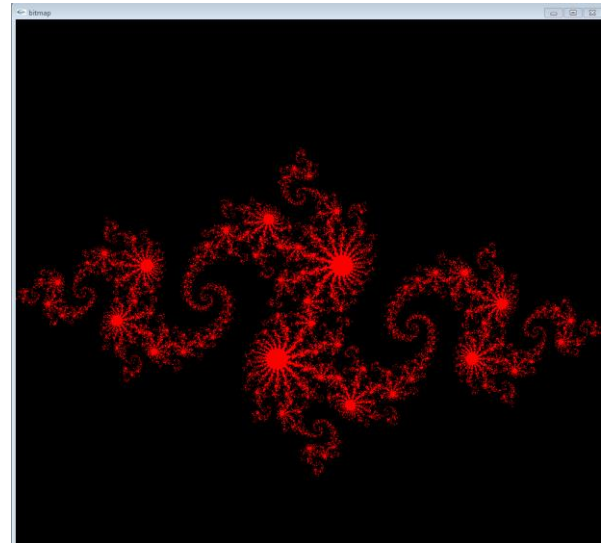
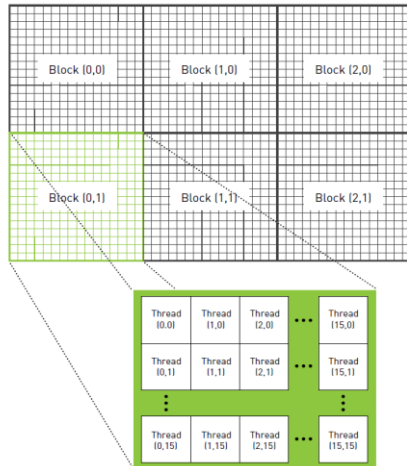
# Course Schedule

- Day 1:
  - Lecture 1: Intro to parallel programming and GPGPU evolution
  - Lecture 2: Introduction to CUDA
  - Hands-on lab 1: Vector addition: CUDA C/C++



# Course Schedule

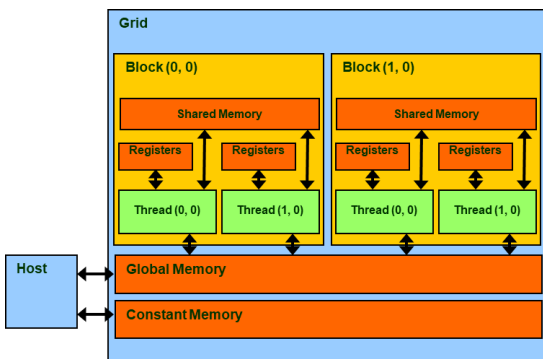
- Day 2:
  - Lecture 3: CUDA threads & performance considerations
  - Lecture 4: CUDA Memories
  - Hands-on lab 2: Julia Set CUDA/C++



# Course Schedule

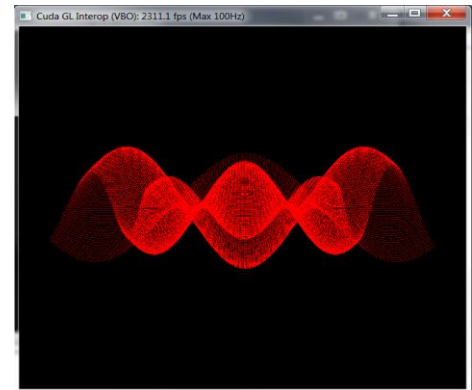
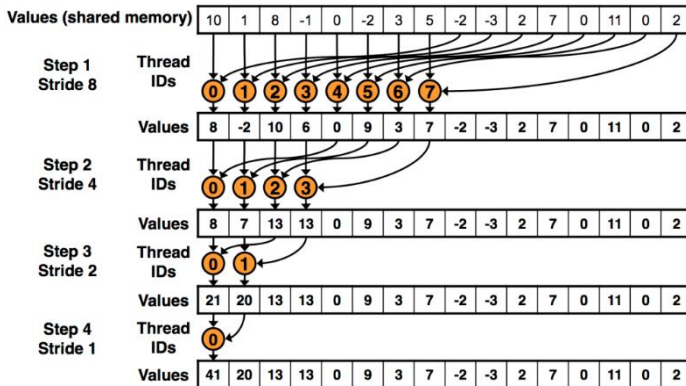
## – Day 3:

- Lecture 4: CUDA Memories (II)
- Lecture 6: CUDA libraries & CUDA Applications
- Hands-on lab 3: Image processing: Median filter. CUDA/C++



# Course Schedule

- Day 4:
  - Lecture 4: Parallel operation on the GPU
  - Lecture 5: CUDA/OpenGL interoperability
  - Hands-on lab 4: Parallel Reduction CUDA/C++
  - Hands-on lab 5: CUDA/OpenGL interoperability



# Course Schedule

## – Day 5:

- Lecture 6: CUDA libraries & CUDA Applications
- Lecture 7: GPU Technology trends & research problems
- Hands-on lab 6: ZAXPY operation using Thrust

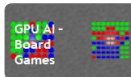
Linear Algebra  
FFT, BLAS,  
SPARSE, Matrix



Numerical & Math  
RAND, Statistics



Data Struct. & AI  
Sort, Scan, Zero Sum



Visual Processing  
Image & Video



$$z = ax + y$$

$x, y, z$  : vector  
 $a$  : scalar

# Course Goals

- Learn how start programming parallel computing systems such as GPUs using CUDA
- Learn about the CUDA programming model
  - Parallel programming API, tools and techniques
  - Processor architecture features and constraints
- Learn about CUDA memories
  - Memory hierarchy
  - CPU vs GPU (comparison)
- Parallel Patterns
  - Parallel reduction, sort, scan, gather, scatter, ...
- Learn about advanced CUDA features
  - Multi-GPU, Unified Memory, Dynamic parallelism
- CUDA libraries & applications
  - Computer Vision applications
- How to organize your CUDA projects
  - Mix CUDA with other libraries such as OpenGL, OpenCV, etc

# Repository

- All lectures, code, and more:

<https://github.com/3dperceptionlab/cuda-workshop-2018>