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Transition: CUDA ↔ OpenCL



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transition\_cuda\_opengl.pptx

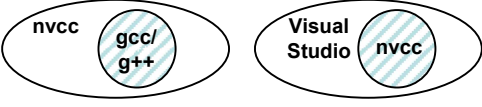
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CUDA Summary

- CPU and GPU programs exist in the same file
  - Can share #defines
  - Can share information on the GPU function calling sequence
- Nvidia-only
- Much utility code provided (linear algebra, machine learning, etc.)
- Well-respected in the research community
- Need special compiler options





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Linux

Windows

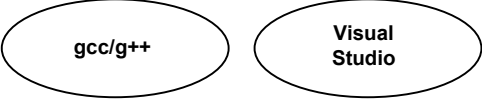
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OpenCL Summary

- CPU and GPU programs exist in separate files
  - Must be sure to set #defines the same
  - You must provide information on the GPU function calling sequence
- Runs on Nvidia GPUs, AMD CPUs/GPUs, Intel CPUs/GPUs, FPGAs, ...
- Little utility code provided
- Code looks a lot like GLSL compute shader code
- Well-respected in the production community
- Need no special compiler options (GPU code compiled in the driver)





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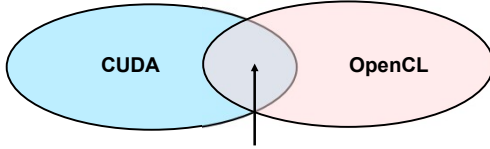
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What's Unique and What's Common?

<ul style="list-style-type: none"> <li>CPU and GPU programs exist in the same file               <ul style="list-style-type: none"> <li>- Can share #defines</li> <li>- Can share information on the GPU function calling sequence</li> </ul> </li> <li>Nvidia-only</li> <li>Much utility code provided (linear algebra, machine learning, etc.)</li> <li>Well-respected in the research community</li> <li>Need special compiler options</li> </ul>	<ul style="list-style-type: none"> <li>CPU and GPU programs exist in separate files               <ul style="list-style-type: none"> <li>- Must be sure to set #defines the same</li> <li>- You must provide information on the GPU function calling sequence</li> </ul> </li> <li>Runs on Nvidia GPUs, AMD CPUs/GPUs, Intel CPUs/GPUs, FPGAs, ...</li> <li>Little utility code provided</li> <li>Code looks a lot like GLSL compute shader code</li> <li>Well-respected in the production community</li> <li>Need no special compiler options (GPU code compiled in the driver)</li> </ul>
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- Allocate data space in GPU memory
- Transfer data from CPU to GPU
- Execute a kernel to compute on that data
- Transfer data back from the GPU to the CPU



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