

Lab 6

Introduction to Programming Laboratory

Goals

- HW3 Announcement
- CUDA Techniques
- 2D/3D kernel
launching
- Task: Sobel

HW3 Announcement

CUDA Techniques

nvidia-smi

Can be used to acquire GPU information: model, memory size, etc.

```
srun --gres=gpu:1 -pipl nvidia-smi
```

deviceQuery

Find out more GPU information

```
cp -r /usr/local/cuda/samples ~  
cd ~/samples/1_Uutilities/deviceQuery  
make  
srun --gres=gpu:1 -pipl ./deviceQuery
```

For example you can see the maximum block/grid size

deviceQuery

The source code is available, so you can also use it in your code!

You can also study other source code samples.

2D/3D kernel launching

`dim3(x, y=1, z=1)`

- `3 = dim3(3) = dim3(3, 1) = dim3(3, 1, 1)`
- `kernel<<<dim3(x,y,z), dim3(i,j,k)>>>` launches a kernel of $x*y*z$ blocks, each containing $i*j*k$ threads
- the x, y, z here corresponds to those in `threadIdx`, `blockIdx`, `blockDim`, `gridDim`
- You can use `printf` to find out

Task: sobel

WIKIPEDIA

Requirements

- Start from `/home/ipl19/y/lab6/sobel_cpu.cu`.
- Port the CPU code to CUDA.
- Name your code `lab6.cu`.
- Demo to TA.

Survey

307.afg984.org/ipl19survey.