Labwork3 Report

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1 Concept

- Load images with different resolution.
- flat images and compute by CPU and GPU.
- make comparison ans conclude.

2 Result

2.1 Gray images

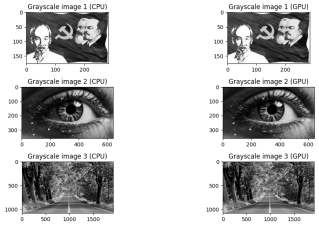

Figure 1: Gray Images computed by GPU and CPU

Same result between GPU and CPU.

2.2 CPU execution time comparison between images

With the increase of the pixels, the execution time increased. The execution time of images are 1s, 4s and 20s respectively. In the biggest number of pixel, the execution time increased significantly, so if the size of images increase, the process with CPU take longer and longer time in execution.

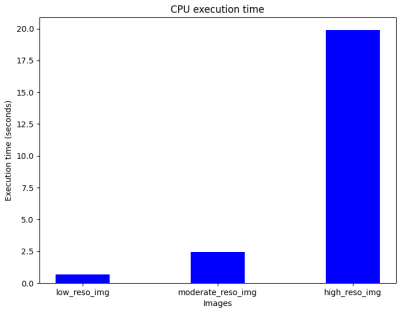

Figure 2: CPU execution time comparison

2.3 GPU execution time comparison between images

The smallest number of pixels has the highest execution time, while 2 remain images have smaller execution time.
Explaination:

- GPUs handles well on big tasks with lots of data. Low-resolution image doesn't have enough data to keep the GPU performance, so it doesn't perform as efficiently. Larger images give the GPU more to do, so it works faster.
- GPU take time for initialization in first image.
- Generally, the execution time of GPU is tiny compared to the execution time of CPU. It proved that GPU has better performance on simple tasks.

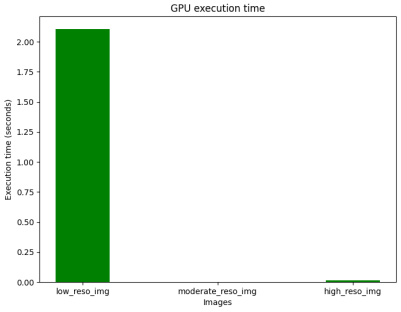

Figure 3: GPU execution time comparison

3 Conclusion

- GPU and CUDA work well with large-scale parallel tasks.

- The computation decreased significantly when using GPU for simple computation.
- The GPU will return better result if it work with large computation.