
GPGPU Programming Lab 3

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1 Acceleration with A Hierarchical Method

1.1 Algorithm

- compute the fixed values of the whole target image and background image.
- for each iteration:
 - change the image(buf1) (including fixed values) to lower resolutions in some specific iterations. (We only store part of values, for example, we store $(W/2) * (H/2)$ pixels in the $1/2x$ scale.
 - do Poisson editing.
 - change the image(buf1) to higher resolutions if the resolution scale changes in the next iteration.
- paste the result to the background image.

For the sample image, I set the total *iterations* to 2000, and change the resolution scales from $1/16x$ to $1x$ in 0, 100, 200, 300, 400 iteration.

1.2 Analysis

To show the speed up, I choose 2000 as the number of iterations and use both original method and hierarchical method in the sample image. You can see the result that in the original method, we need 20000 iterations to converge, but only 2000 iterations in the hierarchical method.



Figure 1.1: sample result with original method and 2000 iterations



Figure 1.2: sample result with hierarchical method and 2000 iterations