

Acceleration & Analyze

GPGPU Assignment #3

Implement Poisson Editing for image cloning on the GPUs.

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Successive Over-Relaxation Method (SOR)

- SOR is just a interpolation/extrapolation between current values and the values of the next iteration.

$$C'_{b,SOR} = \omega C'_b + (1 - \omega)C_b.$$

- Usually, we use $\omega < 1$ to ensure the convergence while $\omega > 1$ to accelerate the convergence.
- **Choose larger ω (e.g., 2) initially**, and decrease it to 1 later after a few iterations.

SOR Evaluation

- I tuned **the ω in the first five iterations**, and set $\omega=1$ for the rest of iterations to see the its effect on convergence.
- Simply determine if it has reached the convergence by eyes.

ω	iterations	Time(us)
1	20000	2044880
1.2	16000	1617444
1.4	14000	1494285
1.6	12000	1233999
1.8	11000	1145667
2.0	10000	1051008
2.5	10000	1044487
3	15000	1553770

Interesting examples and results

My_target



My_background



My_result

