1. Describe how you picked for your threshold and how you got it.

Threshold : width is 200, height is also 200

How : I tested 200x200 image and slightly large one. Then I found that 200x200 image convolution is slower than original convolution but other one is almost same.

1. Describe how you determine how many threads are create.

4 threads are created because I checked out the occurred time by increasing the threads one by one, but the four were the fastest.

1. Report of Measurements comparing the original non-threaded version

|  |  |  |
| --- | --- | --- |
|  | Original Version | My Version |
| Single small image | real 0m1.144s  user 0m0.000s  sys 0m0.000s | real 0m0.853s  user 0m0.000s  sys 0m0.000s |
| Single medium image | real 0m48.132s  user 0m0.000s  sys 0m0.016s | real 0m37.031s  user 0m0.000s  sys 0m0.016s |
| Single large image | real 1m45.348s  user 0m0.000s  sys 0m0.016s | real 1m11.892s  user 0m0.000s  sys 0m0.000s |
| Multiple small images | real 0m2.848s  user 0m0.000s  sys 0m0.000s | real 0m1.889s  user 0m0.000s  sys 0m0.000s |
| Multiple medium images | real 2m5.702s  user 0m0.000s  sys 0m0.000s | real 1m28.485s  user 0m0.000s  sys 0m0.016s |
| Multiple large images | real 5m0.096s  user 0m0.000s  sys 0m0.000s | real 3m3.205s  user 0m0.000s  sys 0m0.000s |

Tested measurements are building and running on Windows using VS2017 15.8.2

I tested 3 pictures for multiple images.

**Cpu information**

Using cat /proc/cpuinfo on ubuntu

processor : 0

vendor\_id : GenuineIntel

cpu family : 6

model : 78

model name : Intel(R) Core(TM) i7-6500U CPU @ 2.50GHz

stepping : 3

microcode : 0xffffffff

cpu MHz : 2592.000

cache size : 256 KB

physical id : 0

siblings : 4

core id : 0

cpu cores : 2

apicid : 0

initial apicid : 0

fpu : yes

fpu\_exception : yes

cpuid level : 6

wp : yes

flags : fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp lm pni pclmulqdq dtes64 monitor ds\_cpl vmx est tm2 ssse3 fma cx16 xtpr pdcm pcid sse4\_1 sse4\_2 x2apic movbe popcnt tsc\_deadline\_timer aes xsave osxsave avx f16c rdrand

bogomips : 5184.00

clflush size : 64

cache\_alignment : 64

address sizes : 36 bits physical, 48 bits virtual

power management: