

# Threads to improve Image Sharpening

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# Submission Contents

- This set of slides
- 120K image - 300x400
- 12M image - 3000x4000
- Makefile
- sharpen.c - single core exe
- sharpen\_grid.c - multicore exe
- test.py - testing script to run exes and collect data

# Case 1) single threaded 120K image vs 12M image

- Run test.py with “python3 test.py 1”
- Concurrently run htop in the background
- 120K Case
  - Average read time of .23s
  - Average execute time of .53s
  - Very low jitter in these values
  - Htop shows the CPU usage spike on a single seemingly random core. This could be an artifact of the exe time being less than the 1s poll interval of htop
- 12M case
  - Average read time of 23s
  - Average execute time of 53s
  - Very low jitter in these values
  - Htop shows the CPU usage spike on a random core and its stays at 100% during the duration of the tests. Some migration appears to happen occasionally, but rarely
- See log\_case1.txt for output log

## Case 2) 3 Row Threads 4 Col Threads. 120K vs 12M

- Run test.py with “python3 test.py 2”
- Concurrently run htop in the background
- 120K Case
  - Average read time of .23s
  - Average execute time of .23s
  - More jitter than in single threaded case
  - Htop does not give good data here because the execution time is so much smaller than the 1s poll time
- 12M case
  - Average read time of 23s
  - Average execute time of 15s
  - Very low jitter in these values
  - Htop shows the CPU usage spike on a random core and its stays at 100%. Randomly, all 4 cores will shoot up to 98% usage for a period of about 5s and then it will return to just one core being utilized at 100%
- See log\_case2.txt for output log

## Case 3) Compare 12M multi to single threaded

- Case 1 and 2 already produced the data we need to compare
- In both cases number of frames was set to 300
- Single threaded Case)
  - Exe time = 53s (i.e. latency)
  - Frames = 300
  - Frame rate = 6 fps
- Multi threaded Case, 7 total threads)
  - Exe time = 15s (i.e. latency)
  - Frames = 300
  - Frame rate = 20 fps