

Rohit Kapoor  
kapoor.83@osu.edu  
November 9, 2015

# CSE 5441

## Comparison of Pthreads with OpenMP

I modified the values of Epsilon and Delta such that my convergence loop runs 72890 times with the minimum temperature being 42.5499 and maximum temperature being 43.8658. Following is the comparison of actual time (wall clock time) and CPU clock time of both the versions of the program.

### Comparison of Wall clock time

Threads	Pthread	OpenMP
1	7.80085 seconds	3.58239 seconds
2	6.00598 seconds	2.77503 seconds
4	8.63737 seconds	1.71404 seconds
8	23.0121 seconds	6.99526 seconds
16	100.375 seconds	13.2933 seconds
32	Didn't execute	24.9082 seconds
64	Didn't execute	47.1676 seconds

### Comparison of CPU clock time

Threads	Pthread	OpenMP
1	8.52 seconds	3.54 seconds
2	10.79 seconds	5.49 seconds
4	17.18 seconds	6.76 seconds
8	36.86 seconds	17.41 seconds
16	121.23 seconds	22.71 seconds

Threads	Pthread	OpenMP
32	Didn't execute	35.89 seconds
64	Didn't execute	61.46 seconds

While executing OpenMP, I always got the **exact number of threads** I asked for. The detailed result is included in the file names Stats.txt.

• **Which threading mechanism, pthreads or OpenMP, provided the best results in your case?**

**Ans:** OpenMP provided better result for me. it can be seen in the above table.

• **Which threading mechanism, pthreads or OpenMP, was the easiest to implement?**

**Ans:** OpenMP was easier to implement, I only added 3 lines of code and my sequential code was parallel.

• **Which threading mechanism, pthreads or OpenMP, would you be most likely to select for a similar application?**

**Ans:** I would select OpenMP because it is easier to implement and also gave better results.

• **Under what circumstances would you speculate that the other mechanism, pthreads or OpenMP, be preferable?**

**Ans:** I would use Pthreads only if number of threads actually executing is a factor in my program as OpenMP does not guarantee number of threads.

• **What were the most significant surprises you encountered in this exercise?**

**Ans:** The first surprise was, how easy it was to implement OpenMP and the second surprise was that OpenMP actually performed *much* better than Pthreads.