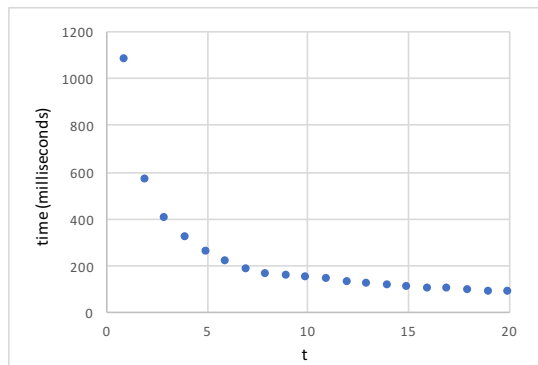
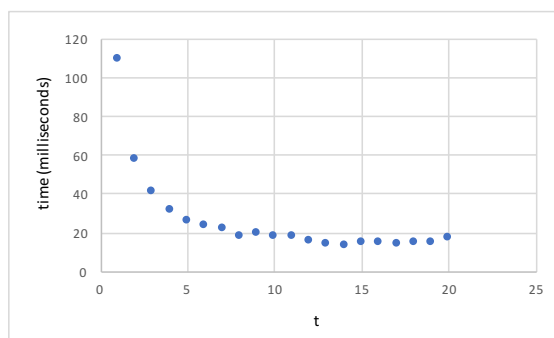


1c

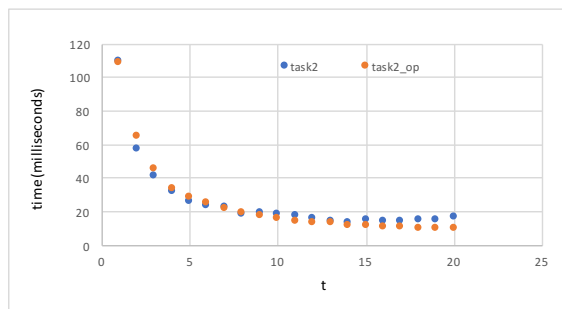


2c



The performance is improved till t gets 7. When  $t > 7$ , the performance is limited by main memory bandwidth.

2d



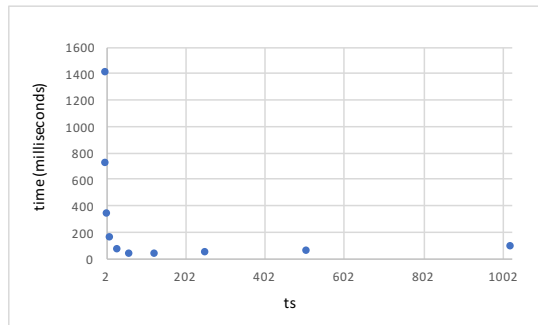
by setting below environment variables, it achieves more NUMA-friendly.

`export OMP_PLACES=threads`, since I want to restrict candidate places to be thread-level.

`export OMP_PROC_BIND=close`, since the Convolve function is computation bound.

The task\_op pattern gets better performance after  $t \geq 10$ .

3c



When  $ts = 128$ , it gets the best performance.

