

Towards a concurrency platform for scalable multi-axial real-time hybrid simulation: Supplementary Material

1 OVERVIEW

This supplement includes additional plots of execution time data collected for the following article.

Marion Sudvarg, Oren Bell, Tyler Martin, Benjamin Standaert, Tao Zhang, Sun-Beom Kwon, Chris Gill, Arun Prakash. “Towards a Concurrency Platform for Scalable Multi-Axial Real-Time Hybrid Simulation.” *Frontiers in Built Environment*. Sec. Earthquake Engineering, Volume 10, August 2024. Special issue, **Experimental Benchmark Control Problem on Multi-axial Real-time Hybrid Simulation**. Available: <https://doi.org/10.3389/fbuil.2024.1424721>

2 ADDITIONAL PLOTS

Figure 6 in Section 5.1 of the referenced article shows the median execution times of the OMP implementation for the nine-story structural model for each combination of model size and number of cores. The other execution time statistics that were collected are shown here. Figure S1 repeats the same plot of median execution times. For comparison, Figure S2 shows the 99.865th percentile (3σ) execution times and Figure S3 shows the maximum execution times.

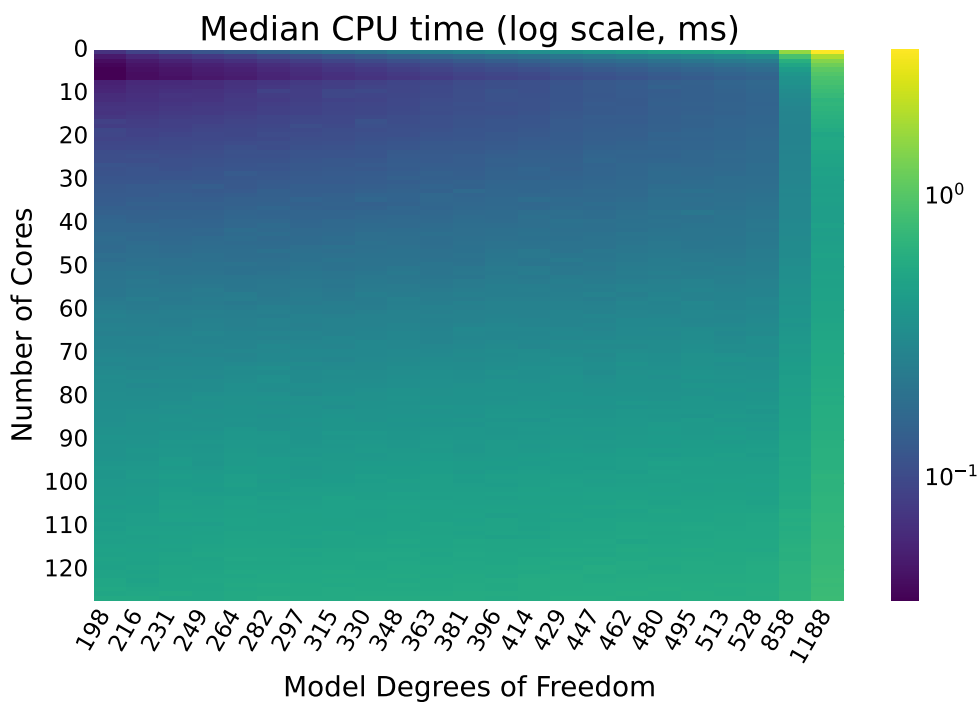


Figure S1. Median OMP execution times for each combination of model size and number of cores for the nine-story structural model.

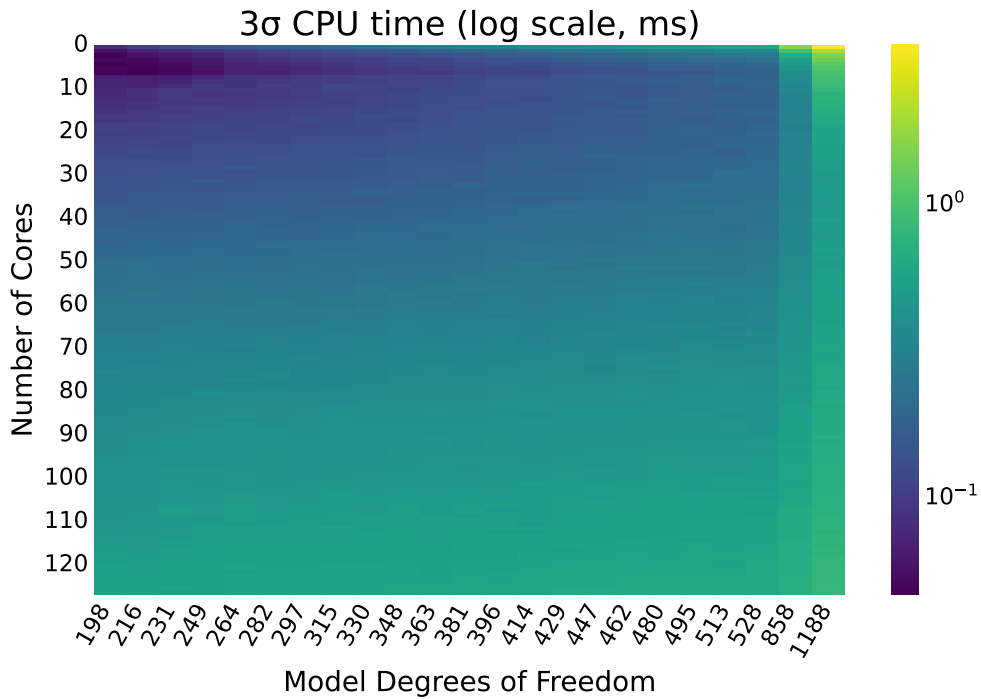


Figure S2. 3σ OMP execution times for each combination of model size and number of cores for the nine-story structural model.

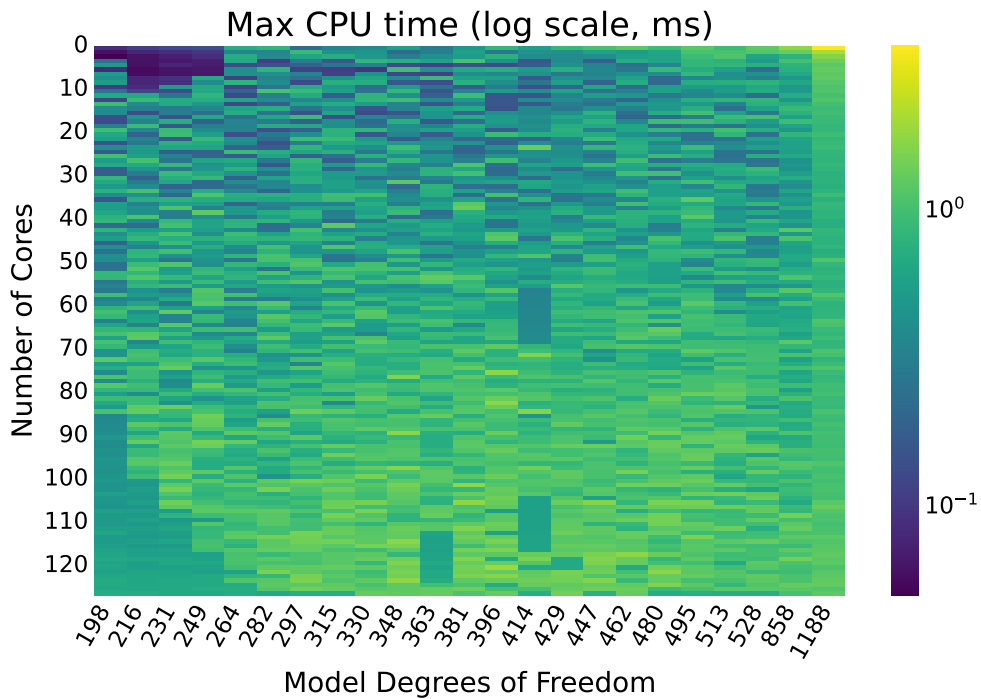


Figure S3. Maximum OMP execution times for each combination of model size and number of cores for the nine-story structural model.

Figure 11 in Section 5.2 of the referenced article shows the median and 3σ execution times of the BLAS implementation for the nine-story structural model for each combination of model size and number of cores. Larger versions of these plots are shown here, along with the maximum execution times. Figure S4 is the same plot, showing median execution times. For comparison, Figure S5 shows the 99.865th percentile (3σ) execution times and Figure S6 shows the maximum execution times.

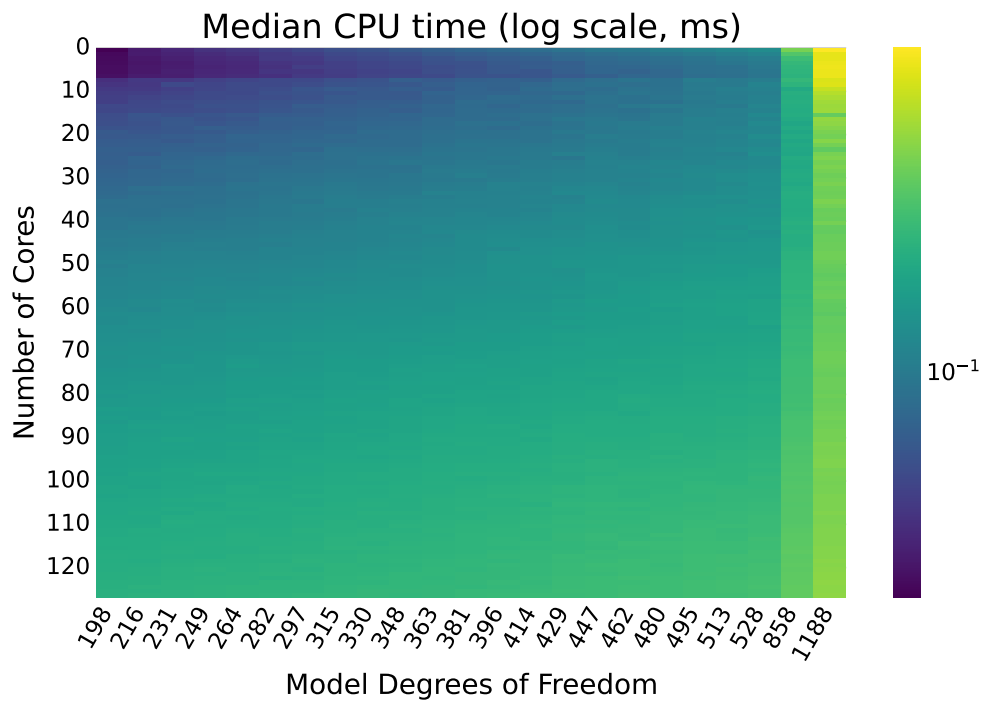


Figure S4. Median BLAS execution times for each combination of model size and number of cores for the nine-story structural model.

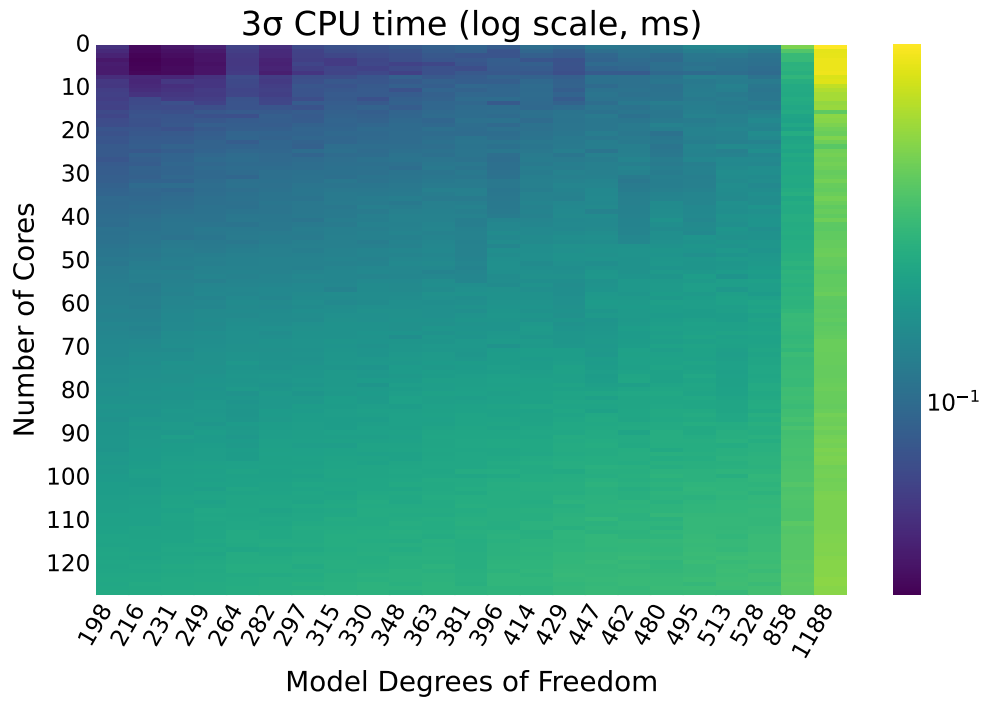


Figure S5. 3σ BLAS execution times for each combination of model size and number of cores for the nine-story structural model.

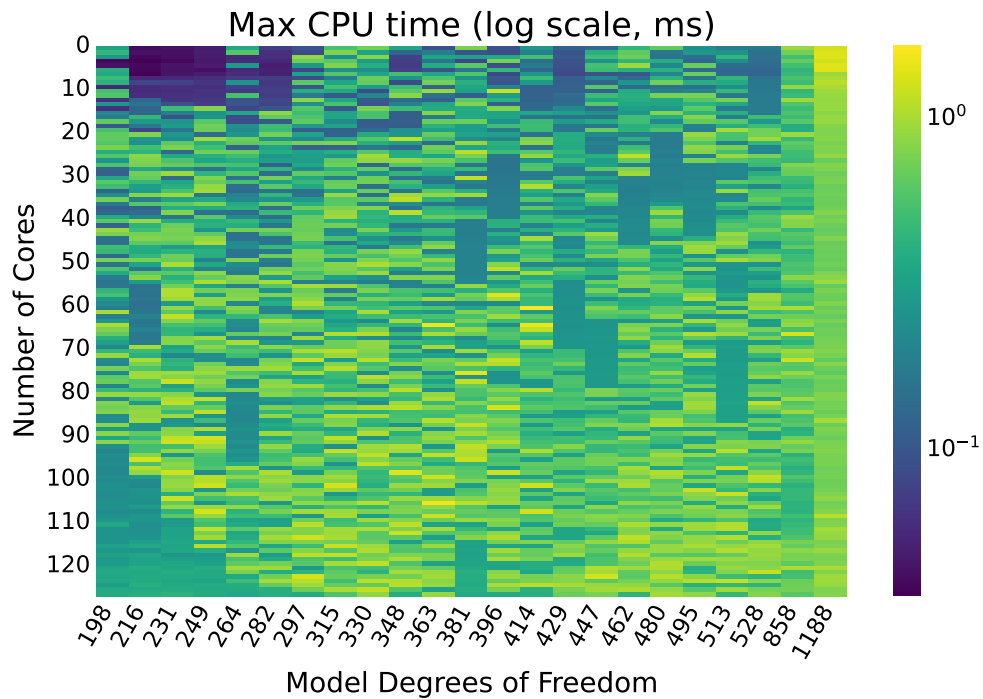


Figure S6. Maximum BLAS execution times for each combination of model size and number of cores for the nine-story structural model.