Shadow Accrual Maps: Efficient Accumulation of City-Scale Shadows over Time Appendix

APPENDIX A
ADDITIONAL EXPERIMENTS

Efficiency of the shadow map baseline. To demonstrate the efficiency of our shadow map implementation used as baseline in our experiments, we compare it with an industry standard game engine. For this comparison, we simulated the same experiment as in Figure 11(a) of the paper. This experiment computes the average time to render 60 shadow maps (corresponding to each minute of an hour) for different camera positions and sun positions. Using the shadow map baseline, this time varies between 100 ms and 240 ms — the time taken to render shadows for a single time step is between 1.5 ms and 4 ms. In fact, the time to render shadows for a given single time step even when the shadow map resolution is 2048×2048 is still less than 5 ms.

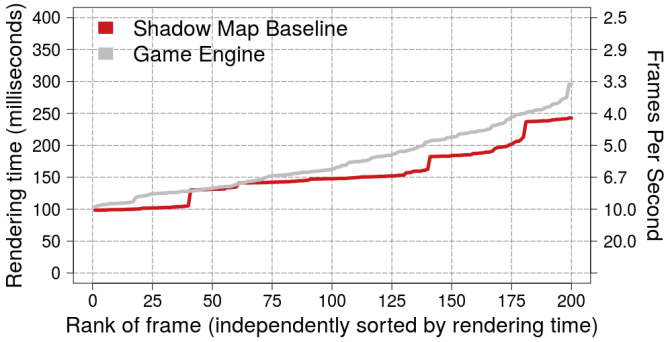

Fig. 1. Comparing our shadow map baseline implementation with shadow computation on an industry standard game engine. The figure plots the average time taken to compute shadows for an hour with a resolution of 1 minute, that is, 60 shadow maps are computed per hour.

Using the game engine, we simply computed shadows for 60 time steps per hour for the same camera positions and sun positions. We however did not perform any accumulation – accumulation will only add an additional step in the game engine pipeline to store these shadows to do the necessary computation. This not only takes up more space, but also requires additional time. Note that even without accumulation being explicitly computed, the performance of our baseline shadow map implementation is on par with that of the game engine.