Adaptive Extraction of Time-Varying Isosurfaces

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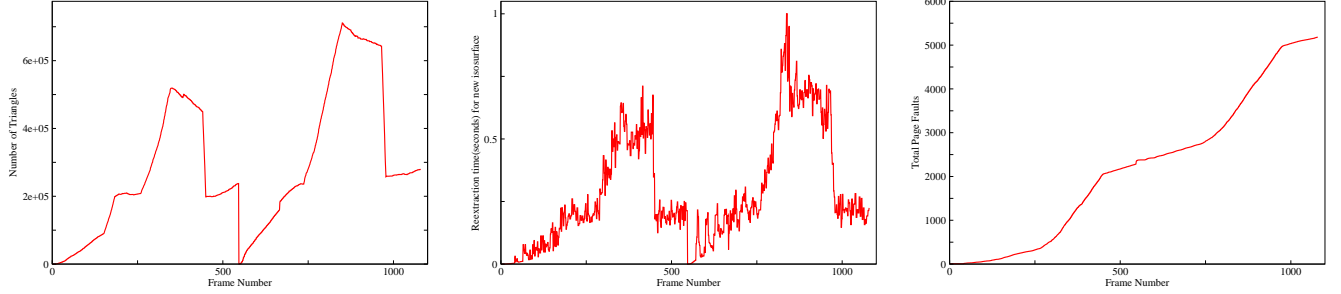
Figure 1: From left to right: Number of triangles, reextraction time, and running page fault count for the video.

1 Video Summary

The dataset is a $256^3 \times 274$ chunk of the Richtmyer-Meshkov dataset. The isosurfaces are extracted from an uncompressed data volume. The text at the top shows, from left to right, the dataset and screen dimensions, error, isovalue, and time step. At the bottom, the upper text shows the frames-per-second, number of triangles and triangles-per-second. The lower text shows the the number of tetrahedra and diamonds in the mesh, the fraction of the tetrahedra reused between frames, and the running number of page faults. The isosurface is extracted using our graphics hardware technique.

The video starts at time step 0, isovalue 223.5, and an error of 1.3. At time step 88 (frame 140) the error changes to 1.0, at time step 135 (frame 249) the error changes to 0.6, and at time step 221 (frame 430) the error changes back to 1.0. The time step is reset to 0 and playback starts again. At time step 657 the isovalue is changed to 200.5, at frame 729 the error is changed from 1.0 to 0.6, and them at frame 956 the error is raised back to 1.0. Figure shows t he number of triangles, isosurface reextraction time, and number of page faults for the video. The larger increases in triangle count, extraction time and page faults starting at frames 250 and 730 corresponds with the error changing from 1.0 to 0.6. Similarly, the drop in triangle count and extraction time, and the decrease in page fault rate around frames 450 and 950, corresponds to the error changing from 0.6 to 1.0. Over the course of the movie, a total of 5180 pages were loaded. This corresponds to about 0.89 GB or 7% of the total dataset.

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