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WAVE: A 3D Online Previewing Framework for Big Data Archives

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With data sets growing beyond petabytes or even terabytes in scientific experiments, there is a trend of keeping data at facilities and providing remote cloud-based services for analysis. However, accessing these data sets remotely is cumbersome due to additional network latency and incomplete metadata description. To ease the data set browsing on remote data archives, our WAVE framework applies an intelligent cache management to provide scientists with a visual feedback on the large data set interactively. We present methods to reduce the large data set size while preserving the visual quality. Our framework supports volume rendering and surface rendering for data inspection and analysis. Furthermore, we enable zoom-on-demand approach, where a selected volumetric region is reloaded with higher details. Finally, we evaluated the WAVE framework using a data set from the entomology science domain.

Primary author: TAN JEROME, Nicholas (Karlsruhe Institute of Technology)

Co-authors: Dr KOPMANN, Andreas (Karlsruhe Institute of Technology); Mr SHKARIN, Andrei (Karlsruhe Institute of Technology); Dr WEBER, Marc (Karlsruhe Institute of Technology); Mr ZAPF, Michael (Karlsruhe Institute of Technology); Dr CHILINGARYAN, Suren (Karlsruhe Institute of Technology)

Presenter: TAN JEROME, Nicholas (Karlsruhe Institute of Technology)

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