

Simplification and Visualisation of Massive Meshes

Problem

Surface reconstruction of large point clouds result in massive 3D meshes (> 100 million triangles). Existing mesh viewers provide poor performance when rendering such large meshes.

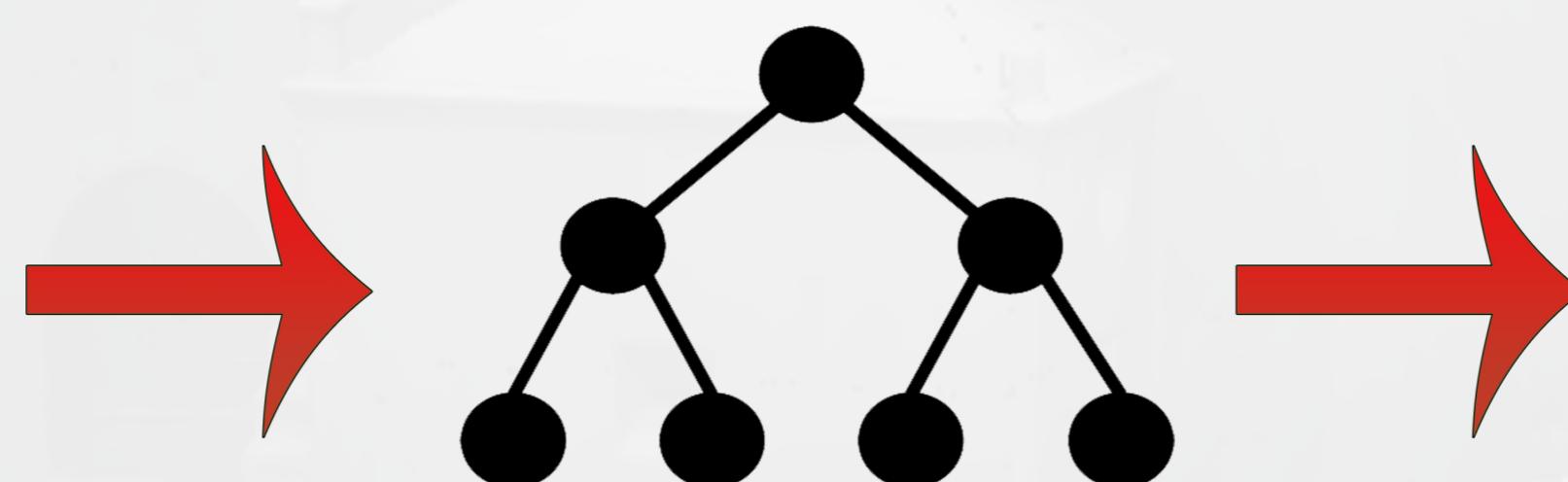


Aim

Develop a mesh viewing tool to render large meshes without sacrificing geometric detail using a hierarchical level-of-detail structure..

Preprocessor

Converts input model into a hierarchical level-of-detail format using mesh splitting, stitching and simplification.

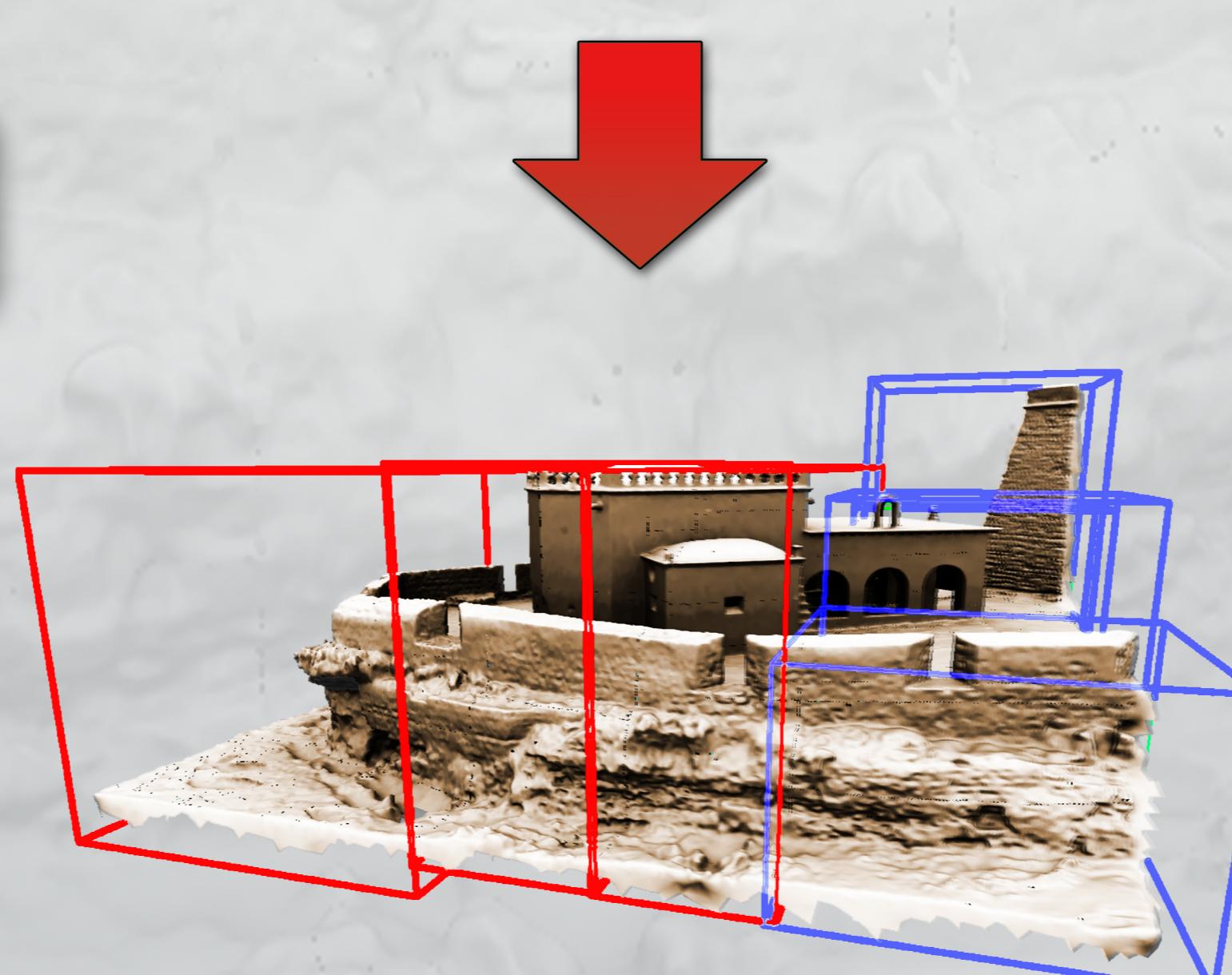


Renderer

Loads and presents the hierarchical level-of-detail file. Uses the position and angle of the camera to control the detail shown in each region of the model.

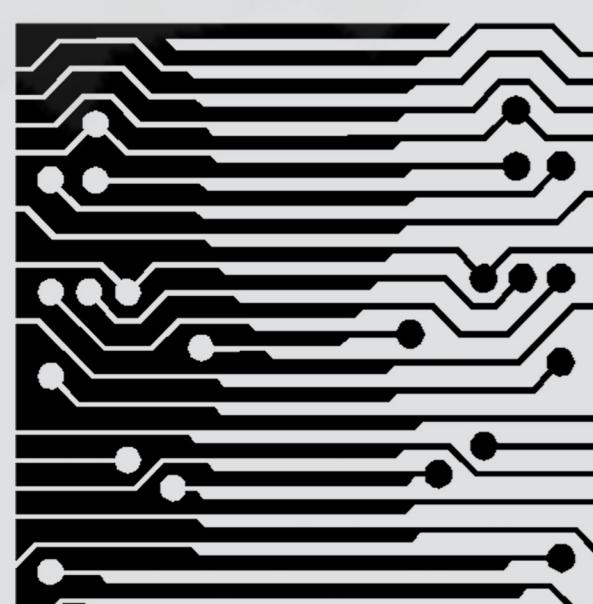
Results

We achieved 40-60 frames per second without compromising detail upon close inspection. Preprocessors output files that are less than 2x the original meshes file size and can process models larger than 6GB.



Conclusion

We developed a tool that successfully solves the problem of viewing complex meshes without compromising on detail.



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