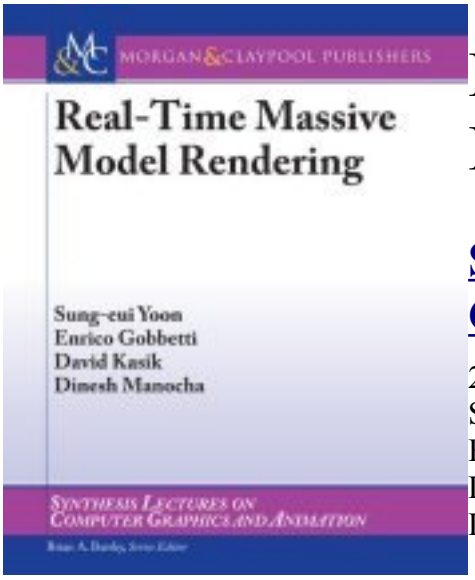

Real-Time Massive Model Rendering

Synthesis Lectures on Computer Graphics and Animation

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Abstract

Interactive display and visualization of large geometric and textured models is becoming a fundamental capability. There are numerous application areas, including games, movies, CAD, virtual prototyping, and scientific visualization. One of observations about geometric models used in interactive applications is that their model complexity continues to increase because of fundamental advances in 3D modeling, simulation, and data capture technologies.

As computing power increases, users take advantage of the algorithmic advances and generate even more complex models and data sets. Therefore, there are many cases where we are required to visualize massive models that consist of hundreds of millions of triangles and, even, billions of triangles. However, interactive visualization and handling of such massive models still remains a challenge in computer graphics and visualization. In this monograph we discuss various techniques that enable interactive visualization of massive models.

These techniques include visibility computation, simplification, levels-of-detail, and cache-coherent data management. We believe that the combinations of these techniques can make it possible to interactively visualize massive models in commodity hardware.

Reference

Sung-eui Yoon, Enrico Gobbetti, David Kasik, Dinesh Manocha. *Real-Time Massive Model Rendering*. Synthesis Lectures on Computer Graphics and Animation Series. Volume 2. Number 1. Morgan and Claypool Publishers, 2008.
http://www.morganclaypool.com/doi/abs/10.2200/S00131ED1V01Y200807CGR007