Abstract

Today, there is a wide variety of devices ranging from PC’s, game consoles, up to smartphones and tablets. These computing devices have major differences in performance and make mesh decimation still active in the field of research. One of the latest topics in the area has been to create simplification algorithms considering visual similarity. However, the full potential of most visual simplification algorithms has yet to be tapped, especially in soft real-time interactive computer simulations such as video games and virtual reality environments. In this paper, a new framework, in which occlusion and visibility are exploited intensively, is introduced in order to simplify models more accurately by taking into account their context in actual 3D scenes. Static background elements are simplified by considering the effect of their surroundings, decreasing the polygon count in the surfaces partially hidden by others. In addition, by allowing users to perform an optimal placement of the cameras in the scene, simplification in regions not seen from such viewpoints is dramatically increased. Dynamic elements, such as characters, accomplish a higher level of simplification since these elements which often consist of multiple meshes, for example, clothes, those resulting from the design stage. These meshes usually
cover some regions of the base mesh and are used as occluders in order to increase the amount of polygon reduction in dynamic elements, barely losing image quality.

References


Index Terms

Computer Science

Information Sciences

Keywords

User-assisted simplification, information-theoretic measures, viewpoint selection, occlusion