Guest Editorial: Special Issue on Applied Perception in Graphics and Visualization (APGV07)

Each year, the ACM Symposium on Applied Perception in Graphics and Visualization (APGV) provides a forum for direct communication between researchers in perception and researchers in computer graphics, visualization and computer vision. The goals of the interdisciplinary exchange are to apply insights from perception to computer graphics and visualization, and to use advanced stimulus generation and presentation methods from computer science to study human perception in ways that would otherwise not be possible.

This special issue of *ACM Transactions on Applied Perception* contains five papers that expand upon work presented at APGV07, which was held in Tübingen, Germany, in July 2007. The articles in this special issue cover a very wide range of topics in which perception and computation can be brought together for mutual benefit.

In *A Perceptual Approach to Unstructured Lumigraphs*, Morvan and O'Sullivan present a method that applies image fidelity metrics to remove visually redundant views from unstructured lumigraphs (an image-based rendering method), and perform user studies to evaluate its performance. Trimming the lumigraphs this way leads to a more compact data representation and faster rendering without substantial loss in visual appearance.

In *Virtual Shapers and Movers: Form and Motion affect Sex Perception*, McDonnell et al. explore the contribution of body motion to perceived gender with a view to avatar creation and crowd simulation. They find that both body shape and distinctive walking motions contribute to the apparent sex of an animated character, and argue that realistic crowd simulations should not rely on generic walk cycles.

In *A Local Roughness Measure for 3D Meshes and its Application to Visual Masking*, Lavoué exploits visual masking to hide 3D mesh artifacts by restricting them to rough portions of the mesh, where they are less visually detectable. This has applications in mesh compression and watermarking.

In *Hybrid Image/Model-Based Gaze-Contingent Rendering*, Murphy et al. present a method in which 3D model data and rendering are degraded in a gaze-contingent way to reduce computational resources. They evaluate the system with visual search tasks, which allows them to identify optimal parameters for achieving high quality visual with maximal reduction in computation.

In *A Perceptive Evaluation of Volume Rendering Techniques*, Boucheny et al. present a psychophysical study on volume rendered 3D textures, which extends studies of transparency perception from two-layer images to a continuum of layers. Although rendered 3D volumes are used heavily in medical image visualization, few researchers have examined how well humans perceive depth in such images. This article examines how the choice of the transfer function (density-to-luminance) and the presence of visual cues such as motion and perspective affect the perception of volume rendered 3D textures.

We wish to thank the reviewers for their detailed and careful assessments of the submissions.

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