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Guest editorial

# Parallel graphics and visualization

Computer graphics and visualization are very active fields of Computer Science, continuously producing new and exciting results. However, the demand for increasingly faster feedback together with the huge volume of data usually associated with these applications, result on growing computational requirements. An efficient utilization of a multiplicity of computational and visualization resources expedites data processing for image generation, thus enabling such requirements to be met.

This special issue of Parallel Computing attends to a selection of six papers out of 21 published at the past 2006 Eurographics Symposium on Parallel Graphics and Visualization, which was held in May 2006 in Braga, Portugal.

The Eurographics Symposium on Parallel Graphics and Visualization focuses on theoretical and applied research issues critical to parallel and distributed computing and its application to all aspects of computer graphics, virtual reality, scientific and engineering visualization. Parallel graphics and visualization has evolved dramatically in the last few years. While previous works focused on SIMD architectures and standard PC clusters, more recent research moved to large displays and visualization oriented cluster architectures, which include graphics processing units at each node. This trend can be observed on the papers selected for this special issue: two papers present results on realistic rendering on PC clusters, two papers focus on parallel volume rendering resorting to graphics processing units and two papers address large displays and visualization clusters.

The paper by Chalmers et al. combines parallel processing on a cluster with visual perception to achieve high fidelity physically based selective rendering at close to interactive rates. Thomaszewski et al. also use a PC cluster to perform physically based simulations of cloth, modelling both the material properties and the interaction with the surrounding scene. Bernardon et al. exploit CPU and GPU parallelism to render volumes of unstructured grids with time varying data. Other volume rendering technique is presented by Müller et al. using a sort last approach to perform volume ray casting on the fragment shaders of a GPU cluster. Cotting et al. present a software genlock approach for Windows, compatible with off-the-shelf graphics hardware, which can be employed to build cost effective VR installations such as large tiled displays. Lorenz and Brunnett add a new functionality to Chromium, where a new point-to-multipoint connection based on UDP allows rendering of large scenes synchronously on an arbitrary number of tiled displays at nearby constant performance.

We hope that this special issue provides an interesting overview into parallel graphics and visualization. Further interest in the topic can be satisfied by following the Symposia on Parallel Graphics and Visualization, the 2007 one taking place in Lugano, Switzerland.

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