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International Conference on Computational Science, ICCS 2010

Visualization in Computational Science

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Abstract

This section and the papers that follow relate to the workshop on Visualization in Computational Science which is held at the Tenth International Conference on Computational Science (ICCS2010) in Amsterdam, the Netherlands. This workshop brings together experts from visualization research and end-users to illustrate the state of the art and advance potential areas of common interest. © 2010 Published by Elsevier Ltd.

Introduction

The main motivation for this workshop is that researchers in computational science are faced with significant challenges in the analyses of their data. The increase in performance and capabilities of high-performance computing systems allow them to investigate problems of increasing size and complexity. As a result, the data sets that are generated by these problems have also grown considerably, both in size and complexity. This has made unsupervised analysis increasingly difficult, if not impossible. Where unsupervised means of analyses fall short, interactive methods are often the only alternative. Here, the researcher uses his cognitive abilities, knowledge and experience to detect patterns in his data. The most popular way to do this is through visualization.

Visualization is an indispensable method to detect structure and patterns in these data sets. This includes the development of increasingly advanced visualization algorithms that map data features to visual constructs, user-friendly human-computer interaction that encourages interactive visual exploration, and computing architectures that improve the use and responsiveness of interactive graphics displays. This workshop brings together experts from visualization research and end-users to illustrate the state of the art and advance potential areas of common interest.

What can you expect at this workshop

This workshop attracted 20 paper submissions, 11 of which were selected by our reviewers for publication and either oral or poster presentation at the workshop. The papers cover a wide range of subjects, including:

- *interactive systems* that integrate simulation and visualization into “human-in-the-loop” interactive simulations (McAdam, Charles Sturt University, Australia) with several approaches that use GPUs to accelerate time constrained algorithms in both simulations and graphics rendering (Leist *et al.*, Massey University Albany, New

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Zealand) as well as GPU algorithms for crease detection and rendering (Barakat *et al.*, Purdue University, United States);

- *service-oriented approaches* to the visualization of distributed data sources, both on a systems-design level (Wood *et al.*, University of Leeds, United Kingdom) and applied to medical image analysis (Koulouzis *et al.*, University of Amsterdam, the Netherlands);
- *immersive visualization environments*; the study of the effects of immersion and navigation (Henry *et al.*, Virginia Tech, United States), and an overview of selection methods for the creation and management of content in a CAVE (Dunk *et al.*, University of Reading, United Kingdom);
- *applied visualization* in computational science domains: the use adaptive graphs for the visualization of volumetric meshes (Robaina *et al.*, Universidade Federal Fluminense, Brasil), visualization applied to developmental biology and accelerator physics (Rübel *et al.*, Lawrence Berkeley National lab, United States) and the visualization of data from finance (Wu *et al.*, University of Sydney, Australia) and astrophysics (Jin *et al.*, University of Portsmouth, United Kingdom).

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- Prof. Peter Harris, University of Melbourne, Australia
- Prof. Chris Johnson, University of Utah, USA
- Dr. Elena Zudilova-Seinstra, University of Amsterdam, The Netherlands

Last; I look forward to welcoming you in Amsterdam for the presentations of the paper submissions in this workshop. This tenth ICCS conference promises to be special, and I promise you that this workshop will not be any different.