Contemporary Information Technology: Information Visualization, Virtual Environment, Visual Perception and Analisys

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Abstract

The ever increasing complexity of the physical phenomena studied in scientific and engineering disciplines, requires the development of new approaches and powerful technique for processing and analysis of complex and Big data. Scientific Visualization developing methods and tools for understanding the problems to be solved by bringing in a person's ability to see and perceive the image.

The report deals with the preconditions of occurrence of this scientific field, the stages of its formation as a scientific discipline and major achievements. Shows the transition from technology to render virtual environment. Currently, scientific visualization is quite complete scientific discipline. Purpose of virtual environments is to provide users with a virtual workspace, in which they can observe and investigate create the virtual real-time data, models and the scenes. Presents selected results of the development of scientific visualization and virtual environment from the Moscow Institute of Physics and Technology and the Institute of Computing for Physics and Technology in cooperation with research centers in Germany and Singapore.

In conclusion ascertained advantages of visualization technologies and virtual environments to improve the efficiency of fundamental research, to meet the challenges of science, education and industry.

Promising areas of research in this subject area are information visualization, visual analytics, a new man-machine interfaces based on haptic devices and tangible images.

The contents of the report: An Historical Excursus, What is Visualization, From Visualization to Virtual Environment, Contemporary VE Installations, Current State-of-the-Art, Available Base and Research Experience, Where We Go, Support for Decision-Making, Virtual Simulation of Tangible Interaction, Conclusions.

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