

Scientific Visualization and Visual Analytics Challenges

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Abstract

With the latest advanced of Data and Computational Science, the need to be able to visualize and analyze scientific results, as well as represent and deal with vast amount of data (Big Data), becomes of unquestionable importance. This talk focuses on current trends and needs for analyzing and visualizing Big Data. First it analyses the interplay between High Performance Computing (HPC), Information Visualization and Virtual Reality (VR). In particular, the needs of visual analytics for data and compute intensive problems. Some examples combining HPC and high-end visualization and VR approaches will be drawn from areas of Marketing, Customer Relations and Security areas.

Then, it will address different techniques for visualizing Big Data, considering the visualization process as a complex and greedy task. This part will show in particular that, when it comes to Big Data, current tools do not scale well and specific techniques should be applied. Some examples will be presented for processing and visualizing urban data produced in real-time.

Finally we will show how to use this data for predicting particular behavior, using crowd simulation and Machine Learning techniques in combination with visual analytics methods. Sometimes this predicted behavior will be used for prevention, for example, in the case of undesirable behavior in security applications. In other cases, it will be used to strengthen the said behavior in some cases of marketing and customer relations.



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