Simulation Data Summarization Based on Spatial Histograms

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Abstract : In order to analyze large-scale scientific data, research on data exploration and visualization has gained popularity. In this paper, we focus on the exploration and visualization of scientific simulation data, and define a spatial V-Optimal histogram for data summarization. We propose histogram construction algorithms based on a general binary hierarchical partitioning as well as a more specific one, the l-grid partitioning. For effective data summarization and efficient data visualization in scientific data analysis, we propose an optimal algorithm as well as a heuristic algorithm for histogram construction. To verify the effectiveness and efficiency of the proposed methods, we conduct experiments on the massive evacuation simulation data.

Keywords : simulation data, data summarization, spatial histograms, exploration, visualization

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