Feature Articles

22 GPU-Accelerated Interactive Visualization and Planning of Neurosurgical Interventions
Mario Rincón-Nigro, Nikhil V. Navkar, Nikolaos V. Tsekos, and Zhigang Deng
A proposed GPU-accelerated method enables interactive quantitative estimation of the risk associated with neurosurgical access paths. It exploits spatially accelerated data structures and efficient implementation of algorithms on GPUs. In evaluations, the method achieved interactive rates, even for high-resolution meshes.

32 Head-Pose-Based Attention Recognition on Large Public Displays
Andreas Riener and Andreas Sippl
Estimating peoples’ attention to regions of large public displays has been a continuing problem. A method for estimating users’ visual focus of attention could lead to a solution. Toward that end, researchers evaluated how several factors affected the accuracy of attention recognition based on only the head pose.

42 Visual Analytics for Power Grid Contingency Analysis
Pak Chung Wong, Zhenyu Huang, Yousu Chen, Patrick Mackey, and Shuangshuang Jin
A proposed visual-analytics pipeline can transform approximately 100 million contingency scenarios to a manageable size and form. Grid operators can examine individual scenarios and devise preventive or mitigation strategies in a timely manner. Power grid engineers have applied the pipeline to a Western Electricity Coordinating Council power grid model.

52 Highly Parallel Algorithms for Visual-Perception-Guided Surface Remeshing
Lianping Xing, Xiaoting Zhang, Charlie C.L. Wang, and Kin-Chuen Hui
A proposed framework extracts visual-perception information in a polygonal model’s image space and maps it back to the Euclidean space. On the basis of these cues, the framework generates a saliency field to resample the input model. A projection operator further optimizes the distribution of resampled points.
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