Feature Articles

12 Magic Cards: A New Augmented-Reality Approach
Olivier Demuynck and José Manuel Menéndez
Augmented-reality applications commonly use markers for detecting and tracking virtual objects. However, these applications limit user interaction because they require knowledge of how to design and program 3D objects. The Magic Cards system offers an easier approach to creating and managing an unlimited number of virtual objects encoded on special markers.

20 Generating Freestyle Group Formations in Agent-Based Crowd Simulations
Qin Gu and Zhigang Deng
An interactive, scalable framework generates freestyle group formations and transitions via natural and flexible sketching interaction. It computes a plausible agent distribution in the target formation and agent correspondences between keyframes. Two-level formation trajectory control lets users intuitively guide agents’ transition paths from the initial formation to the target formation.

32 Conservative Sampling of Solids in Image Space
Yuen-Shan Leung and Charlie C.L. Wang
Conservative sampling samples boundary representation (B-rep) solid models into layered depth images (LDIs). The resulting models have a closed boundary and are guaranteed to bound the input B-rep models on the rays of LDIs. This approach can be implemented by shader programs supported by various graphics hardware.

44 A VR Simulator for Intracardiac Intervention
Patricia Chiang, Jianmin Zheng, You Yu, Koon Hou Mak, Chee Kong Chui, and Yiyu Cai
A VR simulator provides low-cost, realistic training for intracardiac techniques for determining the heart’s mechanical and electrical activities. A geometric method models interaction between a catheter and the heart wall. Boundary-enhanced voxelization accelerates detection of catheter-heart interaction. A tactile interface incorporates a VR catheter unit to track the catheter’s movement.

58 Spectrum-Based Network Visualization for Topology Analysis
Xianlin Hu, Aidong Lu, and Xintao Wu
Based on recent achievements in spectrum-based analysis, a visual-analytics approach uses the features of node distribution and coordinates in the high-dimensional spectral space. To assist exploration of network topologies, network visualization and interactive analysis let users filter nodes and edges in a way that’s meaningful to the global topology structure.
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