T hree papers in this issue of TVCG are expanded versions of ones presented at the IEEE Symposium on Information Visualization (InfoVis) 2003. These examples convey the breadth of work in the InfoVis community, attacking practically motivated problems from sophisticated mathematical and scientific perspectives. They demonstrate an interaction technique for navigation, a mathematically well-founded approach to the difficult problem of dimensionality reduction, and an evaluation of a particular channel of visual perception.

“A Model for Smooth Viewing and Navigation of Large 2D Information Spaces” by Jarke van Wijk and and Wim Nuij won the InfoVis Best Paper Award. They consider the problem of combining panning and zooming for moving around in large information spaces. Applying techniques from differential geometry, they derive a closed form solution and provide empirical values for its parameters. (In their presentation at InfoVis, they polled the audience to find the most pleasing trade off.) Interestingly, their work also settles an open question proposed by Mackinlay, Card, and Robertson in their 1990 SIGGRAPH paper, “Rapid Controlled Movement through a Virtual 3D Workspace.”

“Robust Linear Dimensionality Reduction” by Liran Carmel and Yehuda Koren is a fine example of assisting data analysis through visualization. The authors present several algorithms for projecting multidimensional data onto lower spaces via linear transformations, extending the basic PCA (principal components analysis) technique to handle weights on the distances between points. This makes it convenient, for example, to incorporate categorical labels and to downweight the effects of outliers in the data.

“Conveying Shapes with Texture: Experimental Investigations of Texture’s Effects on Shape Categorization Judgments” by Victoria Interrante, Sunghee Kim, and Haleh Hagh-Shenas describes detailed user studies investigating the effectiveness of novel texture synthesis techniques previously published in TVCG. The question of how texture affects the perception of shape in computer graphics is subtle. The authors introduce an experimental methodological and show that, for a certain set of shape recognition problems, textures with patterns oriented along the principle direction of curvature increased the accuracy of shape category judgments as long as the view is from an oblique direction. InfoVis encompasses studies of the synthesis and perception of information that is not intrinsically geometric and this work is relevant to a broad range of visualization applications.

Daniel A. Keim, Tamara Munzner, and Stephen C. North
Guest Editors

Guest Editors’ Introduction:
Special Section on InfoVis

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