

Design and Visualization for Exploring Real-World Data

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FROM THE EDITORS

Associate Editor-in-Chief Richard Zhang outlines published articles in this regular queue issue.

The current issue features articles from our regular queue. A central theme of these articles is *design and visualization for exploring real-world data*. Also included is the winning entry of the 2018 VAST Challenge. Coming up in the May/June issue, we have a Special Issue, edited by Ligang Liu and Scott Schaeffer, on geometric modeling and processing, covering applications in computer graphics, vision, CAD/CAM, and VR/AR.

IN THIS ISSUE

Regular submissions are papers that have been submitted (and accepted) without a specific focus theme, yet we are finding among them a significant number of articles that tackle the challenge of reasoning and exploring real-world data, over highly diverse application domains.

In “Exploring the Design Space of Sankey Diagrams for the Food-Energy-Water Nexus,” the authors define a set of design requirements relating to Sankey diagrams to facilitate the exploration and understanding of connections between food, energy, and water data. They propose a visualization design to improve the readability of Sankey diagrams.

An interactive visualization tool called QuteVis is presented in the paper “QuteVis: Visually Studying Transportation Patterns Using Multisketch Query of Joint Traffic Situations.” The tool allows users to employ multisketch queries specified on a city map to discover the times when particular traffic patterns

occur at various city locations. With the interactive visualization tool, the users can browse, compare, and analyze the retrieved traffic patterns.

During the current pandemic, enabling frontline users, e.g., police officers and social workers, to record, monitor, and gain insights over geospatial-temporal community-level events (CLEs), becomes especially critical. CLEVis, a tool introduced in the paper “CLEVis: A Semantic Driven Visual Analytics System for Community Level Events” is a neighborhood visual analytics system for CLE datasets, designed to help frontline users explore events at regions of interests in the communities and discover relevant insights. One of the key features of the tool is a full utilization of semantic information, combining automatic algorithms and interactive explorations.

Moving from social data analytics to natural sciences, the paper “Visualizing Acoustic Imaging of Hydrothermal Plumes on the Seafloor” develops a visualization tool to help domain scientists better understand hydrothermal plumes from acoustic imaging data. These plumes are ongoing venting of hot solutions, over months to years time, caused by volcanic activities on the seafloor. Challenges associated with understanding the complex behavior of plumes in a long-time series are alleviated with the geovisualization tool, combined with time-varying feature-based techniques, to allow both visual exploration and analysis by the scientists.

In the paper “CARTOLABE: A Web-Based Scalable Visualization of Large Document Collections,” a web-based multiscale system to visualize and explore large text corpora based on topics is presented. The key novelty of this work is progressive visualization of filtering queries, which were initially designed to represent and explore scientific publications. CARTOLABE presents a

generic framework to handle various very large corpora including *Wikipedia* (4.5M entries) and the *French National Debate*.

Finally, "Blending Machine Learning and Interaction Design in Audio Explorer," the winning entry of the 2018 VAST Challenge, presents an interactive

data exploration tool to help domain experts better interpret machine learning models. The Audio Explorer provides an effective means to communicate machine learning results through a combination of geospatial, temporal, and auditory visualizations to facilitate information discovery.



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The banner features a row of five circular icons representing sustainability: a globe, a sun, a lightbulb, a cloud with rain, and a hand holding a flame. To the right is a stylized tree with a yellow trunk and blue and orange foliage. The background is a teal gradient with a faint binary code pattern.

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