**A Snapshot of Current Trends in Visualization**

Guest Editors' Introduction • Theresa-Marie Rhyne and Min Chen • January 2014

For this issue of Computing Now, we gathered a set of articles that exemplifies current trends in computer-generated visualization. The field of *visualization* was benchmarked in 1987 with a landmark report, entitled "Visualization in Scientific Computing," which was prepared by the (US) National Science Foundation (NSF) Panel on Graphics, Image Processing, and Workstations. That report set out the vision for developing visualization as a scientific field. Over the past 25 years, the field has expanded to encompass three major subfields — namely, scientific visualization, information visualization, and visual analytics — as well as many domain-specific areas, such as geo-information visualization, biological data visualization, and software visualization.

The five articles featured in this issue of Computing Now represent the best visualization research in recent years. Some demonstrate visualization's significant role as a ubiquitous technology that impacts nearly every walk of life. Others reflect the current and emerging trends in visualization and its subfields.

**The Articles**

The first three articles illustrate visualization's indisputable importance in climate sciences, the effective use of interactive visualization for analyzing multifaceted pronouncements such as university rankings, and the wide availability of visualization techniques as open source software.

In "Feature Tracking and Visualization of the Madden-Julian Oscillation in Climate Simulated," Teng-Yok Lee and his colleagues demonstrate how a web-based visualization tool has helped climatologists explore large-scale temporal and spatial climate data and effectively analyze high-resolution simulation results. Part of an IEEE Computer Graphics & Applications (CG&A) special issue on big-data visualization, the article describes how the visualization tool made use of the Google Earth interface and integrated various visual features such as cloud and event tracking with a virtual globe. User feedback has confirmed that this web-based visualization tool is easy to access and has improved climatologists' scientific workflow. - See more at: http://www.computer.org/portal/web/computingnow/archive/january2014?lf1=498701397d786516088499b16217374#sthash.v7bz3Ptd.dpuf

Samuel Gratzl and his colleagues' "LineUp: Visual Analysis of Multi-Attribute Rankings" addresses the common challenge of interpreting ranking tables compiled from many different, often competing, ranking criteria. Using a university ranking case study, the authors illustrate that interactive visualization can help users explore the effect of different combinations of attributes to establish the most appropriate ranking tables for their specific observation tasks. For example, prospective students looking for a college or university can create insightful ranking tables according to their individual study needs. A demo version is available at http://lineup.caleydo.org. This paper won the best paper award in the recent IEEE Information Visualization Conference and appeared in IEEE Transactions on Visualization and Computer Graphics (TVCG) as part of the conference proceedings. - See more at: <http://www.computer.org/portal/web/computingnow/archive/january2014?lf1=498701397d786516088499b16217374#sthash.v7bz3Ptd.dpuf>

The TVCG article "D3 Data-Driven Documents," by Michael Bostock, Vadim Ogievetsky, and Jeffrey Heer, describes the D3 JavaScript library for manipulating documents based on data (www.d3js.org). Through the data join (a novel method for manipulating a standard scenegraph using data) and a suite of common visualization algorithms, D3 has become one of the most popular open-source libraries for web-based visualization. Putting standard technical jargon (HTML5, DOM, SVG, and so on) aside, D3.js is the most talked about visualization software among web programmers today. –

We selected the fourth article to mark the 10-year anniversary of visual analytics, which is a subfield established by the late Jim Thomas and his colleagues. Jean-Daniel Fekete's Computer article, "Visual Analytics Infrastructure: From Data Management to Exploration," builds on advancements in visual analytics over the past decade and sets a challenge for the field to support the exploration of and interaction with big data. It presents a convincing argument that any new infrastructures for big data analytics must be equipped with new functionalities in addition to the current technologies for information visualization, data analysis, and data management. A senior research scientist at INRIA, Fekete is the general chair for IEEE VIS 2014, which will be held in Paris in November 2014 (see www.ieeevis.org) — the first time this prestigious event will convene outside the US. - See more at: http://www.computer.org/portal/web/computingnow/archive/january2014?lf1=498701397d786516088499b16217374#sthash.v7bz3Ptd.dpuf

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