

The 2012 Visualization Career Award



Ben Shneiderman

The 2012 Visualization Career Award goes to Ben Shneiderman in recognition of contributions to and leadership in information visualization and human computer interaction. The IEEE Visualization & Graphics Technical Community (VGTC) is pleased to award Ben Shneiderman the 2012 Visualization Career Award.

BIOGRAPHY

Ben Shneiderman is a Professor in the Department of Computer Science and Founding Director (1983-2000) of the Human-Computer Interaction Laboratory (HCIL, <http://www.cs.umd.edu/hcil/>) at the University of Maryland. He is a member of the Institute for Advanced Computer Studies and Glenn L. Martin Professor of Engineering. He is a Member of the National Academy of Engineering and a Fellow of the AAAS, ACM, SIGCHI, and IEEE.

Shneiderman stresses gratitude for his many excellent graduate student researchers, colleagues, and 25-year collaboration with Catherine Plaisant, with whom he co-authored the 5th edition of *Designing the User Interface: Strategies for Effective Human-Computer Interaction* (2010). Seeking a broader audience, Shneiderman wrote *Leonardo's Laptop* (MIT Press, 2002), which won the IEEE book award for Distinguished Literary Contribution.

His pioneering research on the highlighted selectable hypertext link, high-precision touchscreens, and menu selection strategies were important contributions to the development of human-computer interaction and the commercialization of interactive technologies. By 1990 his focus shifted to information visualization and then visual analytics. Shneiderman created information visualization methods to give users visual overviews of large databases, including the starfield (scattergram with zooming, filtering, and color coded items) with multiple coordinated windows. Users control these displays with dynamic queries by using double-boxed range sliders for numeric values. They can also apply alphasliders for nominal lists and buttons or check boxes for categorical variables. These strategies became refined and successfully commercialized in 1997 by Spotfire, which grew to 200+ employees, till it was acquired by TIBCO in 2007. Shneiderman coined the Visual Information Seeking Mantra: "Overview first, zoom and filter, then details-on-demand." The paper describing it has acquired nearly 2000 citations, stimulating many extensions, counter proposals, and some parodies.

An influential project was the treemap visualization to represent hierarchical data with a space-filling set of rectangles that could be color and size coded to represent leaf node attributes. The large number of derivative research projects and commercial implementations have brought treemaps to tens of millions of users, by way of the web-based Smartmoney Map-of-the-Market (for which he was an advisor), the New York Times, as well as in corporate and government projects. Shneiderman continues as a Technical Advisor for The Hive Group, a leading treemap supplier.

Medical visualizations included the Visible Human Explorer for showing anatomical image data and the revolutionary LifeLines for presenting a single person's medical history. Then work on the powerful search tool, LifeLines2, expanded the visualization with operations to align, rank, and filter millions of electronic health records. Further contributions were made with the LifeFlow summarization and current efforts focus on the EventFlow extensions to deal with more elaborate interval and event searching. These innovative tools for searching temporal event sequences are applicable in many other domains such as legal, financial, web log, and intelligence analyses.

To promote understanding of the potential for information visualization Shneiderman worked with Stu Card and Jock Mackinlay to produce a highly successful collection of *Readings*



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in *Information Visualization: Using Vision to Think* (Morgan Kaufmann Publ., 1999) that included 60,000 words of introduction and commentary. Shneiderman also worked with colleague Ben Bederson to present HCIL's contributions with introductory commentaries in *The Craft of Information Visualization: Readings and Reflections* (Morgan Kaufmann Publ., 2003)

Research on numerical time series led to the TimeSearcher series of software tools, and extensions such as the Shape Searcher Edition to find spikes, sinks, rises, etc. The Hierarchical Clustering Explorer applied advanced statistical tools to find clusters, relationships, outliers, gaps, and other features in high-dimensional numerical data.

Integrating statistics and visualization became the driving concept for network analysis in SocialAction, where the systematic yet flexible framework proved valuable when evaluated through Multi-dimensional In-Depth Long-term Case Studies. Another concept for network visualization, called semantic substrates, was to place nodes in 2-D layouts based on their attribute values. This concept was incorporated in the NVSS tool, which had successful application in citation analysis projects. Ideas from SocialAction and NVSS have been included in the Action Science Explorer and in NodeXL, which is a free, open source tool that has had more than 125,000 downloads. The related book with Derek Hansen and Marc Smith, is *Analyzing Social Media Networks with NodeXL* (Morgan Kaufmann Publ., 2010). The NodeXL work continues with novel layout strategies, advanced filtering, and motif simplification. Shneiderman is a technical advisor for network analysis provider Centrifuge Systems.

Shneiderman reminds his audiences that "the goal of visualization is insight, not pictures." He believes that visualization empowers users to make deeper insights about the world around us and to ask better questions. Visual analytics processes enable policy makers, business leaders, and engaged citizens to collaborate more effectively and make better decisions so as to improve life for everyone.

AWARD INFORMATION

The IEEE VGTC Visualization Career Award was established in 2004. It is given every year to an individual to honor that person's lifetime contribution to visualization. VGTC members may nominate individuals for the Visualization Career Award by contacting the awards chair, Lawrence Rosenblum, at vgtc-vis-awards@vgtc.org.

For more information, please visit <http://www.cs.umd.edu/~ben>.