Thinking with Visualization

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Abstract

Visualizations help us to solve problems by finding patterns in graphical displays of data. For example, finding a pattern of highly connected components in a node link diagram can help us understand the architecture of a software system. Finding a long, red, fairly straight line on a map can show us the best way of driving between two cities. This talk will describe how thinking with visualizations involves the construction of visual queries on the display. Once a visual query is constructed, a visual search strategy through eye movements and attention to relevant patterns provides answers. Recent results from cognitive psychology can help us understand the visual thinking process. I will show how understanding the nature of visual queries, and the capacity of visual working memory, can be used to predict which visual tasks will be easy and which will be difficult, if not impossible. Examples from common visualizations and interactive techniques will be used to illustrate the central concepts.

Bio

Colin Ware's research is focused on applying our understanding of human perception to information display. He has published more than 100 articles on this subject and a recent book: Information Visualization: Perception for Design. In addition to theory-based research Ware likes to build useful visualization systems. Fledermaus, a GIS visualization package originally by him and his students is now the leading 3D visualization system used in oceanography. Ware is a professor of Computer Science and Director of the Data Visualization Research Laboratory at the University of New Hampshire. He has degrees in both experimental psychology (PhD, Toronto) and Computer Science (M.Math, Waterloo).

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