Geophysical Research Abstracts
Vol. 15, EGU2013-2353, 2013
EGU General Assembly 2013

Information Visualization Techniques for Effective Cross-Discipline Communication

Ward Fisher
UCAR Unidata, Boulder, United States (wfisher@unidata.ucar.edu)

Collaboration between research groups in different fields is a common occurrence, but it can often be frustrating due to the absence of a common vocabulary. This lack of a shared context can make expressing important concepts and discussing results difficult. This problem may be further exacerbated when communicating to an audience of laypeople. Without a clear frame of reference, simple concepts are often rendered difficult-to-understand at best, and unintelligible at worst. An easy way to alleviate this confusion is with the use of clear, well-designed visualizations to illustrate an idea, process or conclusion.

There exist a number of well-described machine-learning and statistical techniques which can be used to illuminate the information present within complex high-dimensional datasets. Once the information has been separated from the data, clear communication becomes a matter of selecting an appropriate visualization. Ideally, the visualization is information-rich but data-scarce. Anything from a simple bar chart, to a line chart with confidence intervals, to an animated set of 3D point-clouds can be used to render a complex idea as an easily understood image.

Several case studies will be presented in this work. In the first study, we will examine how a complex statistical analysis was applied to a high-dimensional dataset, and how the results were succinctly communicated to an audience of microbiologists and chemical engineers. Next, we will examine a technique used to illustrate the concept of the singular value decomposition, as used in the field of computer vision, to a lay audience of undergraduate students from mixed majors. We will then examine a case where a simple animated line plot was used to communicate an approach to signal decomposition, and will finish with a discussion of the tools available to create these visualizations.