

# A Review of *A Rule-based Tool for Assisting Colormap Selection* by Bergman et al.

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Bibliographic Database Information:

Label is **Bergman1995**.

Category is **Information Visualization**.

## Introduction

- Difficult to produce effective visualization (even with all the controls of modern interfaces).
- One strategy to improve this is to guide user in selection of visualization parameters.
- Paper focuses on improving user's selection of colormaps.
- Build library of colormaps and set of rules for selecting appropriate maps based on structure of data and visualization goal.
- Tool encapsulates this functionality called PRAVADAColor in IBM Visualization Data Explorer software.

## Interactive Rule-based Architecture

- Architecture provides set of choices for visualization based on set of underlying rules which are used to constrain operations (selecting colormap, iso-contour line color, etc.).

## Rule-Based Colormap Selection - Limitations of Current Technology

- Rainbow map is most common default colormap.
- Conceptually mapping linear scale in hue onto a scalar variable. Perceptually, scale does not appear linear. Equal steps in scale do not correspond to equal steps in color, but instead look like bands of fuzzy color varying in hue, saturation, and brightness.
- Gives erroneous impression data organized into discrete regions when mapped onto scalar data.
- Can cause user to infer structure not present and miss details that lie in a single color region.

## A Taxonomy for Colormap Selection

- A nice table of taxonomy of colormaps based on data type, representation task, and principles of perception is given.

### **The Importance of Spatial-Frequency for Ratio and Interval Data**

- Luminance mechanism is tuned to higher spatial frequencies (high resolution, finely detailed, or small-grained features).
- Hue mechanism is tuned to lower spatial frequencies.
- Saturation-based colormaps bad for high spatial frequency information but good for larger-scale spatial variation.

### **The PRAVDAColor Interface**

- Implementation details of the system.
- Good information but too extensive to note here.

## **References**

- [1] L. D. Bergman, B. E. Rogowitz, and L. A. Treinish, "A Rule-based Tool for Assisting Colormap Selection," *Proceedings of 6th IEEE Visualization 1995 Conference*. IEEE Computer Society, 1995, pp. 118–125, <http://www.research.ibm.com/dx/proceedings/pravda/> (current 14 Sep. 2006).