CSCI 444/544 – Data Visualization

**ASSIGNMENT #:** 6

**DUE DATE:** 3/27/2020

**POINTS:** 23

**TOPIC:** Effective Visualization reading

**Overview**

Read the provided sections from Visual Cues: Practical Data Visualization by Peter and Mary Keller.

**Questions**

1) What is the goal of Data Visualization? (1 pt)

The goal is the meaning you hope to derive from the image, and, if appropriate, the meaning you want to communicate to others about your data.

2) Presentations of data should contain what three attributes? (1.5 pts)

Data analysis.

Story telling.

Design.

I couldn’t find it from the reading, so I looked to my internet source.

Maybe it is exploration, analysis, and presentation from the text.

3) Why should we convert data into different formats or structures? Won’t this introduce errors? (3 pts)

We urge you not to hesitate to convert data to a different format or structure as the errors, though harmful if the data were to be used for continued simulation, generally cannot be discerned in the data representation of an image. Errors are tolerable during exploration but should be accounted for during analysis.

4) What are the differences between Data-Representation Technigues and contextual-Cue Techniques? (3 pts)

Data-representation techniques take data as input and produce an output while contextual-cue techniques are usually applied apart from the data-representation algorithm. Data-representation are scatterplots, x-y charts, and histograms. Contextual-cue are special effects produced by adding or removing graphical elements such as scales and grid lines.

5) What is our ultimate goal as visualizers? (1 pt)

The ultimate goal of visualizers is to create complete images that “speak” to the viewer without explanation.

6) What factors affect your choice of output medium? (5 pts)

(this information is a bit dated, so use current devices like computer monitors, data projector, etc.)

When I export my matplotlib graphs, I make sure they have a high resolution so they look good on modern monitors. Most modern monitors retain the same aspect ratio, so I do not worry about the size too much. This could be a problem for mobile users but I have never designed visuals for mobile screens. Dash is nice because it generates a web page, so users could connect to the web page to interact with the visuals themselves rather than someone presenting them. Some colors do not show up well on the projector in our lab classroom, so I may alter the colors to be more distinct so they show up well on the projector. It seems like a lot of the problems our CRT using authors had are slowly dissipating. They mention virtual reality suprisingly.

7) What is the preferred orientation of an image? Why? (1.5 pts)

Different orientations of the same data can reveal different information. The orientation that best exploits this principle should be selected to best convey the data.

8) What techniques can you use to create useful color schemes? (5 pts)

Before constructing your color image, you should verify that color will most effectively communicate the content of your data. Color is best used to identify, classify, locate, and lend realism. The color scheme should capitalize on the power of suggestion and take advantage of real-world or conventional use of color. A few rules: minimize the number of colors selected, minimize the number of highly saturated colors, use contrast to emphasize objects in the main image, minimize the number of highly saturated colors, for background, choose neutral colors that contrast well with the main components of the image, use colors to suggest like meanings, when distinguishing classes or color, use contrasting colors, use additioal cues to delinate a shape, use a sudden color change to mark a critial level, be aware of misleading colors illusions or effects.

9) What causes problems in color integrity and what can you do about it? (2 pts)

Problems with color integrity occur when color is created by one method but reproduced by another method.

When rendering images to film for animation, color integrity problems can arise if portions of the film are developed at different times. The way we solve this problem is by not using film anymore.

CRTs have a hard time rendering black if the background is a transparent black. The same situation applies for white background CRTs. We do not use CRTs anymore.

Printers cannot mirror colors perfectly sometimes. Some colors come out as muddy. The best way around this is to choose a different color. Contrasting colors on a CRT or even a monitor are hard to replicate with ink that does not shine.

Give yourself enough time to evaluate color selection. Experiment with colors in the desired mediums and change them if they are not ideal.

**Submission** - submit it in the Moodle dropbox.