Visualization Critique 1: Static Visualizations

Due: Thursday, October 19, 8am.
Submit: via the class wiki

The use of visualization is pervasive in the media: explanatory diagrams in magazines, graphs describing the projected impact of a new state budget, new experimental data plotted against theoretical expectations, etc. In each case, the author of the visualization tries to convey a point of view by emphasizing some aspects of the data while toning down other aspects. The result can vary widely, from informative to misleading.

In Chapter 1 of The Visual Display of Quantitative Information, Tufte presents the following *Principles of Graphical Excellence*:

> Graphical excellence is the well-designed presentation of interesting data—a matter of substance, of statistics, and of design.
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> Graphical excellence consists of complex ideas communicated with clarity, precision and efficiency.
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> Graphical excellence is that which gives to the viewer the greatest number of ideas in the shortest time with the least ink in the smallest space.
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> Graphical excellence is nearly always multivariate
>
> And graphical excellence requires telling the truth.

And in Chapter 2, the following *Principles of Graphical Integrity*:

> The representation of numbers as physically measured on the surface of the graphic itself, should be directly proportional to the numerical quantities represented
>
> Clear, detailed and thorough labeling should be used to defeat graphical distortion and ambiguity. Write out explanations of the data on the graphic itself. Label important events in the data.
>
> Show data variation, not design variation.
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> In time-series displays of money, deflated and standardized units of monetary measurement are nearly always better than nominal units.
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> The number of information-carrying (variable) dimensions depicted should not exceed the number of dimensions in the data.
>
> Graphics must not quote data out of context.

For this assignment, pick out two examples, one good and one bad visualization, from any of the following sources:

- Textbook
- Science magazine (Nature, Science, Scientific American, ...)
- Magazine or newspaper (Newsweek, The Economist, NY Times, USA Today, ...)

No visualization or information visualization textbook or paper may be used. Go to original sources used by practitioners and researchers. For this assignment, please do not use examples pulled from the web, unless they are merely reproductions of illustrations in one of the above sources.

Once you have selected a good and a bad example, create a critique that includes both pictures and a description for each one example, consisting of 3 parts:

Explanation
Describe the story behind the visualization. What does the visualization show and who is the intended audience? The explanation should be brief but contain enough detail for a non-expert to understand the visualization.

Deconstruction
What data model, image model and encodings are used in the visualization? How large is the data set? Are there any uninformative elements?

Critique
Is the visualization effective? Does it communicate the data? Why or why not? Does the visualization uphold or violate any important design principles? Keep in mind not only perceptual and data-presentation issues, but also the expected background knowledge and cultural conventions of the intended audience. How would you change the visualization to improve it?

Be specific, and include criteria such as accessibility, clarity, accuracy, or any other criterion about the design of the visualization that you feel is important.