

Visualization Critiques

High-level goals for this assignment

This assignment is to help you learn how to recognize, evaluate, and improve examples of information visualization. It tests an understanding of Tufte's principles of excellence and integrity, and your understanding of the Data-Image-Encoding deconstruction taught in Spence, and also in Card, Mackinlay and Shneiderman.

Evaluation approach

For this assignment, we used as our metric a modified version of the guidelines for the iSchool, which are summarized at the end of this document. On this assignment, perfectly satisfactory work was given a 3.3. Common factors that led to lower grades included clear errors, significant lack of detail, or a choice of image that made it impossible to complete the assignment fully (for example, you didn't understand the image).

In spite of every effort to be evenhanded, grading an assignment like this is a very qualitative process. Rather than detailing the personal grading rubric and process we used, we are presenting instead guidelines for writing an excellent critique. This will be helpful both for submitting a replacement critique, and for evaluating your own project.

How to write an excellent VisCritique

The high level principles for excellence are insight and complexity. An excellent visualization provides insight into complex data. An excellent vis critique provides a detailed, insightful analysis of an image, clearly identifying its strengths and weaknesses.

Step 1: Choose your example carefully

If the target of the analysis is a good example, you will need to start with an excellent one to get an excellent result. This means the image should visualize data of complexity (multiple dimensions and/or size) and provide powerful insights. While even the simplest graph provides significantly more insight than a list of numbers, we are looking for Tufte-class examples. A complex example that offers great insight with less than perfect visual design (like the Jakarta train schedule) will be ranked higher than a neatly designed graph or data map showing relatively simple data. Refer to Tufte's principles of Graphical Excellence, and the examples in his books.

If the target of the analysis is a bad example, you need to start with one that has several clearly identifiable, fundamental flaws. The Principles of Graphical Integrity are key here. We rank fundamental misrepresentation of the underlying information higher than errors of labeling or visual clutter caused by excess lines or shading. An important component of the analysis of a bad example is your description of how to improve it. So, choose an image you can improve.

Step 2: Explain your example fully

Who is the audience and where was it presented? Here is where you demonstrate your understanding of the example and its intended audience. If you cannot describe the

audience, or represent their point of view, then you are unlikely to produce a convincing critique. Be complete and specific (not: “anyone who likes this sort of information”), and include where you found the image (magazine, web site, etc.) How well you explain sets the context for evaluating your example and your analysis. An old engraving, for example, would not be expected to use color, even if it would be more effective.

Step 3: Deconstruct in depth

Describe the visualization in terms of the data model (data elements, their types and ranges), image model (data map, table, process diagram, chart/graph, connected graph or tree, etc) and the encodings assigned to the different data elements (color, size, length, etc). Discussion of layering and color are also appropriate.

The goal here is to use the Data-image-encoding model we’ve been teaching you to concretely support your analysis in step 4. A good deconstruction will not only enumerate the components of the model, but discuss the appropriateness of these choices. An excellent deconstruction will provide full detail, including all elements that demonstrate an effective (or ineffective) mapping of data to image, including colors, textures, labels and legends. It will also mention those elements that are unnecessary or ambiguous, and say why.

Deleted: why

Step 4: Critique in detail, and with insight

The goal here is to explain concisely and accurately why the visualization is effective (or not effective). An excellent critique will provide extra detail and show insight as to what makes the visualization effective. For a bad example, it will include substantive improvements.

The explanation and deconstruction feed into this discussion, which should be specific about applying Tufte’s principles. When appropriate, it should reference the deconstruction to provide support. For example, if the problem with the visualization is that the choice of image doesn’t match the data, or that particular data values are encoded inappropriately (color where there needs to be more quantitative precision), say why it is wrong and how it could be done better.

The critique must be presented with respect to the target audience; what is good for a graduate level text book is different than what is good for Smithsonian magazine. It is valid and helpful if you indicate personal experience with the visualization if this leads into a more detailed and compelling explanation of its excellence (or lack of excellence). Simply saying “I like it” or “I find it confusing” is not an adequate critique.

The assignment asks specifically how you would change the visualization to improve it, which is intended to further demonstrate your understanding of what makes an effective visualization. This is especially important for the bad examples. If you have been concrete about the visualization’s flaws, then it should be easy to suggest improvements at the same level (use a different encoding, remove ambiguities or unnecessary elements, rescale to a common standard, etc.) If the visualization is already excellent, there may be little to add, and you may say so, or indicate a few small design or labeling improvements (better layering, less gaudy coloring). If the visualization is poor because it is “content free,” there may be little that could be done to save it. Again, you may say so, but more powerful would be to say, for example, that it really only represents three numbers, which could be listed. As in the critique overall, improvements should be in the context of the image and its users.

General iSchool guidelines for grades

Below is a summary of the guidelines published at:

<http://www.ischool.washington.edu/resources/academic/grading.aspx>

For this assignment, we used this same qualitative ranking, but applied it to our expectations for a 3-4th year undergraduate.

4.0	Exceptional work, doesn't get much better
3.7	Strong work. Very good, but could be improved
3.3	Competent work. Meets requirements fully, but isn't especially strong or weak
3.0	Acceptable, but shows some flaws or difficulty
2.7	Minimally passing. Many weaknesses or deficiencies
2.6-2.0	Deficient. Doesn't meet minimal expectations, flawed by errors or inconsistencies.
2.0-1.0	Unacceptable. Misunderstood the nature of the work required, or shows very little understanding. Errors and inconsistencies throughout
below 1.0	Incomplete / Totally inadequate work. Work was turned in, but was substantially incomplete, or missed the point entirely.
0.0	Not handed in