**Web Page Design Inspired by Edward Tufte**

<http://staff.washington.edu/larryg/Classes/Rinflux/zz-influx.html#Size> Last modified: 07/23/2011

**What affects do screen size and resolution have on graphics on the Web, and how do you develop effective graphics under these constraints?**

This is a large and important topic and is perhaps the reason for the major differences between design on the Web versus paper:

* Differences in size: if we confine our discussion to "traditional" computers and displays, then differences in screen size (as opposed to resolution) don't greatly affect the comprehension of graphics since large 19 inch screens have only 2.5 times the area of small 12 inch screens. However, we now see an increasing number of devices, such as PDAs, cell phones, and even wristwatches, that surf the Web and whose screens are 100 times smaller. Typical Web pages simply won't fit on such devices, and page designs must be specifically targeted for them, although XML/XSL may often be used to re-purpose larger documents to fit.

Compared with large fold out maps or pages that allow the eye to easily sweep over large areas, the Web viewer relies on links to multiple pages that contain portions of the view, and so the overall context is lost -- anyone using a book type map knows how difficult it is to follow a route that crosses different pages; similarly, comparisons in a large scientific chart are very difficult to make when the viewer cannot see all of it at once.

In addition, current LCD screens offer limited screen viewing angles, so even if they were large or high resolution, they would make comprehension over large areas difficult.

* Differences in resolution: these are even more important than size. Theoretically even a page designed for a 20 inch display would fit on a wristwatch display if the resolution were the same, but low resolution screens not only force a user into horizontal scrolling, but may fail to render major portions of it.

Compared with paper, displays in common use today have five to 10 times less resolution. As a result, detail is coarse, small text is faint and fuzzy, and viewing is tiring, especially when screen flicker is present. Also, the overall context is lost, forcing the user to remember and connect information from previous screens, something for which the human mind is poorly suited.

On the other hand, the Web provides tools that partially compensate for this:

* + despite certain usability drawbacks, especially with respect to navigation, one can use frames to display an overall view of a scene in one frame in the form of a clickable image map: when the user clicks on an area in the overview map, a high resolution view of a portion of the image appears in the 2nd frame. This is particularly effective if the image in the first frame highlights the area that was clicked on, displays the current mouse position relative to the map, and if the image map includes a large amount of overlap as well as varying degrees of zoom, bettering the chance of displaying all the context that is desired.
  + sometimes animation can be effectively used in place of "small multiples": a smooth and quickly changing image, especially when it is under full user control, can often convey information better than a static high resolution page
* However, note that the size and resolution advantages of paper over displays will disappear in 5-10 years: already two-megapixel LCD screens on Laptop computers are on the market; IBM recently unveiled a 22 inch LCD with an amazing 9 megapixels that thoroughly rivals the printed page (at present it is very expensive but will surely drop in price), and Miscosoft's ClearType (TM) sub-pixel technology greatly enhances the effective resolution of text and black/white images, sometimes by 300%

In addition, newer LCDs have a wider field of view, and they don't flicker. In the near future, tablet PCs with stylus input can be held and manipulated much like a magazine, are superior for pointing, drawing, and writing than mice and keyboards, and will be augmented by voice and audio input/output. Very large screen displays are on the way as well as retinal displays for wearable computers providing true high resolution stereoscopic images that appear to the wearer to be 6 feet wide.