Font rasterization

Font rasterization is the process of converting text from a vector description (as found in scalable fonts such as TrueType fonts) to a raster or bitmap description. This often involves some anti-aliasing on screen text to make it smoother and easier to read. It may also involve "hinting", that is, the use of information precomputed for a particular font size.

Simple rasterization without antialiasing

The simplest form of rasterization is simple line-drawing with no antialiasing of any sort. This is the fastest method (that is, it requires the least computation to place on screen). This approach has the disadvantage that glyphs may lose their definition when rendered at small sizes. Therefore, many fonts contain "hints" which aid the system's rasterizer in deciding where to render pixels for particularly troublesome areas in the glyphs, or sets of hand-tweaked bitmaps to be used at specific pixel sizes.

Rasterization with antialiasing

A more complicated approach is to use standard anti-aliasing techniques from computer graphics. This can be thought of as determining, for each pixel, how much of that pixel is occupied by the letter, and drawing that pixel with that degree of opacity. For example, when drawing a black letter on a white background, if a pixel ideally should be half filled (perhaps by a diagonal line from corner to corner) it would be drawn in 50% gray. Simple application of this procedure can lead to somewhat blurry glyphs: for example, if the letter includes a vertical line which should be one pixel wide but falls exactly between two pixels, it will appear on screen a two-pixel-wide gray line. This blurriness is a tradeoff of clarity for accuracy. Some systems demonstrate the opposite sacrifice by using hinting to force lines to fall within integral pixel coordinates.

Vectors

One key aspect of vector art is key for printing. Since the art is made from a series of mathematical points it will print very crisp no matter how you resize the art. For instance you can take the same vector logo and print it on a business card or blow it up to billboard size and keep the same crisp quality. In contrast a raster graphic would blur incredibly if it were blown up from a business card size to billboard size.