

Breaking the Myth: One Picture is NOT (Always) Worth a Thousand Words

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Summary

We need to understand well both the power and frailty of images (e.g., compared to words) to be able to use effectively new visualization and computer graphics technologies in science, education, entertainment, and life, and most importantly in the Internet's World Wide Web. The panel and the audience will discuss and debate the weaknesses of images and the difficulty in representing information clearly; the dependency of visual and information perception on past memories, experiences, beliefs, and culture; the difficulty in making effective use of color; and what could be learned from art and design.

"One picture is worth a thousand words" – Fred R. Barnard

"But words are words" – Shakespeare, *Much Ado About Nothing*

"... words are images of thought refin'd" – John Keats, *O Solitude!*

Recent developments of computer visual display hardware on one hand and computer graphics and visualization methods and software on the other have generated new interest in images and visual representations. It is now possible with a "flip of a button" to generate visual depictions of data and information or to take existing images and modify them at ease. This renaissance of visual representation has highlighted the notion of the power of images.

"One picture is worth a 1,000 words," goes the popular saying. People in the graphics and visualization community have perceived it to mean not only that images could portray anything that words can, but that images could do it better than words. However, images may have some disadvantages, and words are sometimes more effective (or powerful) than pictures. To use images effectively, we need to understand when they are equivalent to words, when they are more appropriate than words, and when they are not. This issue has become extremely important with the spread of the World Wide Web (WWW), where many document authors do not know when to use an image and when to express an idea with words.

One problem is that computers representing abstract (e.g., non-numerical) information, and visual computing and display are both new media. The understanding of the characteristics, advantages, and disadvantages of these new media is crucial to their optimal and effective use. This will take some time, however.

Similarly, we need to stop relating to the new medium of visual computing and display as if it were a replica of paper. This new technology allows us go beyond what is possible with paper, and we need to understand the differences between traditional and computer generated images.

This panel and the audience will discuss and debate situations where images (both traditional and computer-generated) do and do not convey information effectively or correctly and where images and words could complement each other.

Nahum Gershon

A Picture is Not a Picture is Not a Picture...: A Picture Could be Worth a 1,000, 1/1,000, or -1,000 Words

The difficulty in representing information clearly, the dependency of visual and information perception on past memories, experiences, beliefs, and culture, and the difficulty in making effective use of color are some examples illustrating the frailty of image representations. To

make full and correct use of what display, graphics, and visualization technologies can offer us, we need to take these considerations into account when generating images or when viewing them. It is true, however, that for certain purposes, images do not need to portray reality exactly. But in these cases, we must be sure the viewers are aware of this fact deep in their minds. Otherwise, we might create pictures that are worth 1/1,000 (Hanson, 1970) of a word or even -1,000 words.

We need to make sure people understand that not everything could effectively be put in a visual form. An example is the term text visualization." People usually imply that images could always represent effectively all the information contained within a collection of text documents, and that it is much easier to get this information from images than from words. Is this really possible? If yes, why was language created, why did silent movies contain textual information, and why was sound introduced to film?

Robert Braham – The Shibboleths of Pictorial Elites

The shibboleth, in its original meaning, was nothing more than a single graphical sign (a word in Hebrew) used as a military password/"passgraph." An enemy user of that graphical sign was caught when even though interpreting its place in the graphical system rationally, he lacked a crucial bit of knowledge about the ambiguities of the graphics known only to the other side — the pictorial elite.

Pictorial elites, even if more well meaning, are now springing up with alarming rapidity, aided by the tools of computer graphics. Basics of semiotic analysis, such as the ramifications of symbolic, indexical and iconic signs, were developed decades ago in linguistic theory, but are powerful concepts for understanding graphics and their power to shape and be shaped by graphic communities.

Using these and other analytical tools, we would do well to compare the graphical/cognitive turning points we are now going through with those that parallel them in earlier times in the West. In the following cases, oral communities – word users – confronted radically new graphics technology: the composition of epic poetry, the Renaissance "rebirth" of 3-D projection, the change from scroll to pamphlet to book, medieval memory technique, and early scientific diagramming, including animation. The history of the earliest notations for Western music, devised for plainchant – an oral communicative system par excellence – holds a particularly interesting position in this light.

David Fracchia

Towards Image Understanding

The phrase "One picture is worth a thousand words" has become cliché in our vernacular. Part of the reason we say it is because we assume that, to quote another cliché, "seeing is believing." That is, as we look around our world, we perceive it at face value as reality. In contrast, while we may acknowledge that words, particularly poetry, may bring to mind multiple images, it is not commonplace to claim that a phrase is worth a thousand pictures. The ambiguity of multiple personal images that arises from verbal communication means that we as a culture do not automatically believe words.

To compensate, our educational system focuses on verbal literacy, allowing us to express ourselves precisely as in mathematics or evocatively as in poetry. In fact, without verbal ambiguity we would lose much of our humor and pleasure in language. Unfortunately, there is no parallel education in visual literacy. While this may not have been a critical issue in the past, now with the advent of advertising, trick

photography, and computer graphics we have the potential for creating visual ambiguity. This puts our whole culture at high risk of being fooled by what they see.

As disturbing as this may sound, the extension of humans' propensity to introduce ambiguity into visual images is a healthy indication of the maturity of visual languages as a communication medium. In fact, we revel in being able to create visual forgeries. What is needed now is to parallel the development of visual language with the exploration of visual literacy.

If we simultaneously want to be able to generate images for our amusement and for information dissemination, we need to understand how pictorial ambiguity arises. We know from work by people such as Bertin, Goodman, Laursen, Tufte, and Ware, that these problems can arise in most aspects of visual representation. It has been suggested that before we can disambiguate images, we need to discover the basic components of visual language. However, exactly what these would be is unclear, particularly in the case of computer images. It is possible that our real clues will come from graphic design and/or perceptual psychology.

Andrew Glassner
Different Media Means Different Messages

Words and images speak to different parts of our experience. Both can be primal or abstract, direct or vague. But novels and paintings are not interchangeable; a poem is not a child's finger-painting. These media are complementary, and neither identical nor antagonistic. Artists can combine these languages to produce interesting and meaningful work, but this composite is yet a third form, and does not subsume or replace the others. Words often fail to describe images, but images just as often fail to capture what can be said by words.

Barbara Mones-Hattal
**A Picture May Be (Or May Not Be) Worth A Thousand Words:
Lessons From The WWW?**

A picture may be worth a thousand words, but those words may not be the same from one person to the next. It has always been a challenge for the artist to design with simplicity, subtlety, and sensitivity. The integration of text and image is not new to the artist. The emergence of the World Wide Web, however, has made for unusual and distinctive design issues. A certain urgency has emerged in order to further refine these relationships as on-line design becomes big business. As the WWW becomes a more effective design multimedia tool, it becomes even more important for us to realize when to use text or graphics, or a combination of the two, in order more successfully utilize this new venue.

Studying the WWW affords us new opportunities to gather enormous amounts of information about successful and less successful design strategies. The design and implementation of icons, the use and overuse/misuse of backgrounds, the potential for audio, 3D and interactive 3D have led to both unique and creative spaces and confusing and/or boring ones. An initial concern about bland and limited design options has replaced itself with new and potentially more exciting ones. However, it becomes important to start to discuss and identify what "successful" Web design might mean, so that we may be more able to both recognize and utilize these spaces with greater confidence.

Russ Rose
P1000: A Picture is Worth 1000 Words

In this era of the information explosion, there exists the need to take advantage of the power provided by the human's visual processing system. Visual exploitation will help in understanding the content of the vast uncharted mountains of information, as well facilitate meaningful analyses of that information. Hence, visual representation of the information can be a powerful enabling force relative to improved understanding.

A picture is worth 1000 words; that is, in 1/1000 the time, a visual image can be processed and analyzed, rather than being represented and processed as words. If represented as words, it would often require

more than 1000 words, would take 1000 times as long to understand, and would still not communicate the content as comprehensively as a visual image can. The visual representation of the information, however, must be based on a comprehensive and information rich structure. If not, it will easily not be worth a single word, let alone the 1000 words (we all have set through tiring briefings centered around charts cluttered with information-free clip art that provides no more than visual noise).

Progress must continue, and be accelerated, in the area of visual representation of information. This progress will only be made through significant commitment of resources, as well as the focus of intellectual energies for the long term.

Afterword

We need to understand well both the advantages and disadvantages of using words, images, or their combinations. This is essential to the effective use of new visualization and computer graphics technologies in science, education, entertainment, and life, and most importantly in the Internet's World Wide Web. We also need to understand better the new media of visual computing and display, and we must take advantage of the experiences and insights of the art and design communities.

References

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