

Lecture 12: Layering and Separation

In this lecture, we continue our exploration of Tufte's design principles. Our overarching goal is to explore the different ways of visualizing complex, multi-variate data. This lecture on layering will combine design principles with the visual and perceptual functions that define lightness and grayscale.

In his Layering chapter, Tufte shows the importance of separating the elements of a complex visualization into its primary and supporting components. Supporting elements should be visually separated, using a combination of relative lightness and color.

The poster my colleague Lyn Bartram and I presented at the IEEE Visualization conference concerns the discovery of algorithmic ways to define layering, specifically for supporting structures such as grids.

Light falling on the retina stimulates the cones, which transmit signals along the optic nerve to the brain. One of the primary signals describes perceived lightness, a quantity called luminance. Accurately modeling the perception of lightness (or brightness) is fundamental to modeling color vision.

Goals for the lecture

By the end of the class, you will be able to:

- Describe the key characteristics of Layering, and how it is applied.
- Give an overview of how the visual system perceives lightness, and describe the following quantitative models: intensity, luminance and L^*
- Describe what is meant by $1+1=3$
- Describe what is meant by "Whisper, Don't Scream."

Reading Assignment

Tufte, *Envisioning Information*, chapter 3.

Things to consider as you read

1. What is $1+1=3$, and how does it relate to layering?
2. How can these principles be applied to your project?

Reflection questions

The questions below are to help you think more broadly about what you've read and its relationship to the class. It is optional, but strongly encouraged, that you answer them and email your answers to info424@gmail.com to aid in discussion in class. Email must be received by 7 am on the day of the class.

1. Find an image or a link that illustrates layering