

CS294-164 Report - Week 2

Medhini G Narasimhan (medhini@berkeley.edu)

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1 Color in the Wild

1.1 Main Idea

This reading mainly focuses on the different basic aspects of human color perception, the color spectrum and the definition of color. It also highlights some common misconceptions among researchers regarding color. Some key points are:

1. Color has nothing to do with wavelength. Colors do not have a one-to-one relation with their monochromatic parts. i.e. yellow can be matched by red+green as well.
2. Humans are mostly trichromats, i.e. they have three types of cone cells. The three types of cones are L, M, and S, which have pigments that respond best to light of long (especially 560 nm), medium (530 nm), and short (420 nm) wavelengths respectively.
3. Color of objects is defined by the spectral reflection factors of objects. A mirror reflects light in only one direction and has no color of its own. Primordial objects have visible surfaces which are roughly lambertian, they reflect light in all directions. All colors are caused by the fact that the spectral reflectance factor is less than that of white, so all colors are "related" to white.
4. **Colorimetry** is the science of measuring color. Radiant power spectra can be added to each other by superimposing them. Metamerism is when two colors which are not the same appear the same under certain lighting conditions. There are infinitely many colors, they can be mapped one-to-one on a three-dimensional continuum. Depending on culture, there are 2-11 colors.

1.2 New idea based on readings

2 Experiments on Color, as perceived by the Eye, with remarks on Color blindness

2.1 Main Idea

2.2 New idea based on readings