

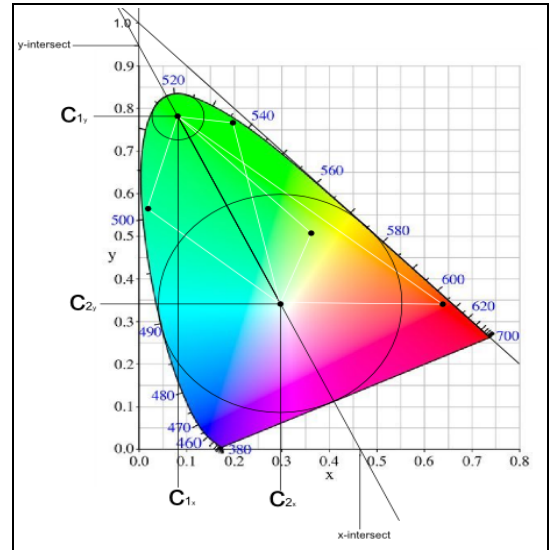
Two full gamut color models

Two reference point model

The idea of this colour model is that it consists of four components: two color coordinates in the CIE model, a brightness value, and a single bit indicating which side of the line joining the two color coordinates the color point is located.

In the image on the right, we see the CIE color space, with two coordinates, C_1 and C_2 , as reference coordinates, at some distance d . Any color point p in the CIE space can be represented by two values, corresponding to how far the color is from point C_1 and from C_2 . For any such combination we can form a triangle $\{C_1, C_2, p\}$ as well as $\{C_1, C_2, p'\}$, where p' is the reflection of p over the line that goes through C_1 and C_2 . To resolve this ambiguity, we use a single bit to indicate *sidedness* of a color coordinate. Finally, an overall brightness value is also required to indicate the color's light/darkness.

This color model, unlike the common color-triangle models (sRGB, AdobeRGB, ProPhoto RGB), can model all the colors in the CIE color space, as well as virtual colors in the domain that fall outside the horseshoe of visible colors.



Divide and conquer model

A variation on this is a quadrant-segmenting mode, which overlays axes on the CIE space and locates color points based on which series of nested quadrants the point is in.

In the image on the right, the CIE color space is segmented into four quadrants, requiring two bits to indicate in which quadrant a point is located. Using the standard bit count from a clean byte, we can subdivide the space into 256 sections that a point can lie in. If we continue this approach, we can get to 65,536 sections using 16 bits, and 16,777,216 sections using 24 bits. Which more than covers all the different hues the human eye can distinguish.

In addition to this hue segmentation, we would also require a brightness component to fully capture color information.

Again, unlike the common color-triangle models (sRGB, AdobeRGB, ProPhoto RGB), this model can model all the colors in the CIE color space, as well as virtual colors in the domain that fall outside the horseshoe of visible colors.

