

What is the Lab space?

The Lab color space, also known as CIELAB or simply Lab, is a color space that was developed to be perceptually uniform, meaning that the perceptual difference between colors is consistent across the color space. It was introduced by the International Commission on Illumination (CIE) to provide a more accurate and consistent representation of color compared to traditional color spaces like RGB and CMYK.

The Lab color space consists of three components:

- *L (Lightness)*:* Represents the brightness of the color. It ranges from 0 to 100, where 0 is black and 100 is white.
- *a (Green to Red)*:* Represents the color on a green to red axis. Negative values represent green, and positive values represent red.
- *b (Blue to Yellow)*:* Represents the color on a blue to yellow axis. Negative values represent blue, and positive values represent yellow.

The Lab color space is device-independent, meaning that it is not tied to the characteristics of a specific device (like a monitor or printer). This makes it a valuable choice for applications where consistent color representation is crucial, such as in color correction and image processing.

The perceptual uniformity of Lab makes it useful in various fields, including color correction, computer vision, and image processing. It allows for more accurate color comparisons and adjustments, and it is often used as an intermediate color space in workflows where color accuracy is important.

Examples of Images in the Lab space

To help the reader understand the functionality of the Lab space we will present an example of its visualization, as well as the corresponding code.

Our original image.



Representation of the space L



Representation of the space a.



Representation of the space b.



