

## Image Normalization

Image normalization is a typical process in image processing that changes the range of pixel intensity values. Its normal purpose is to convert an input image into a range of pixel values that are more familiar or normal to the senses, hence the term normalization.

In this work, we will perform a function that produces a normalization of an input image (grayscale or RGB). Then, we understand a representation of the range of values of the scale of the image represented between 0 and 255, in this way we get, for example, that very dark images become clearer. The linear normalization of a digital image is performed according to the formula

$$\text{Output\_channel} = 255 * (\text{Input\_channel} - \text{min}) / (\text{max} - \text{min})$$

If we are using a grayscale image, we only need to normalize using one channel. However, if we are normalizing a RGB (3 channels) we need to normalize for each channel using the same criteria.

[Here](#), you can see an online demonstration with several inputs.

Examples:



Example 1: The left image depicts the original image while the right picture shows the results after the normalization process. We can see that the original image is too dark while the normalized is not.



Example 2: The left image depicts the original image while the right picture shows the results after the normalization process. We can see that the original image is very bright and difficult to observe by the human eye, while the resulting image presents a better contrast.