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LA Project - Image Convolution

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OVERVIEW

Image convolution is an important image processing technique where two signals(images) are combined to form a third signal mathematically. Here we deal with images using a linear invariant system(LTI system) where an image is the input and the output is always linear. In simple, an image convolved with mask, where mask is a signal represented by a two dimensional matrix. You start with a kernel, which is a small matrix of weights. This kernel slides over the 2D input data, performing an elementwise multiplication with the part of the input it is currently on, and then summing up the results into a single output pixel.

GOALS:

We use image convolution as it overcomes the other two methods of manipulating images by sharpening, blurring, edge detection and noise reduction.

METHOD:

Image convolution is performed by the following steps-

- Flip the mask (horizontally and vertically)
- Slide the mask onto the image.
- Multiply the corresponding elements and then add them
- Repeat this procedure until all values of the image have been calculated.