2D Convolution

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Convolution

Applies 2D mask to 2D image
Still weighted sum
Choice of weights determines the effect

\[ \text{Output}(x, y) = \sum_{i=-N}^{N} \sum_{j=-N}^{N} \text{weight}(i, j) \ast \text{input}(x - i, y - j) \]
Lecture Overview

1. Convolution extension for 
2. Two of many applications: smoothing and edge detection

Convolution ‘Explains’ 

Edge enhancement in human vision

Centre-surround receptors - convolved with retinal image

Hermann grid illusion – full explanation more complex