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# Neural Style Transfer

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Content cost  
function

# Content cost function

$$\underline{J(G)} = \alpha \underline{J_{content}(C, G)} + \beta J_{style}(S, G)$$

- Say you use hidden layer  $l$  to compute content cost.
- Use pre-trained ConvNet. (E.g., VGG network)
- Let  $a^{[l](C)}$  and  $a^{[l](G)}$  be the activation of layer  $l$  on the images
- If  $a^{[l](C)}$  and  $a^{[l](G)}$  are similar, both images have similar content

$$J_{content}(C, G) = \frac{1}{2} \left\| \underbrace{a^{[l](C)}}_{\text{green arrow}} - \underbrace{a^{[l](G)}}_{\text{green arrow}} \right\|^2$$