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Neural Style Transfer

Content cost function

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

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

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