Image colorization using CNNs

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What is colorization?

Neural Network

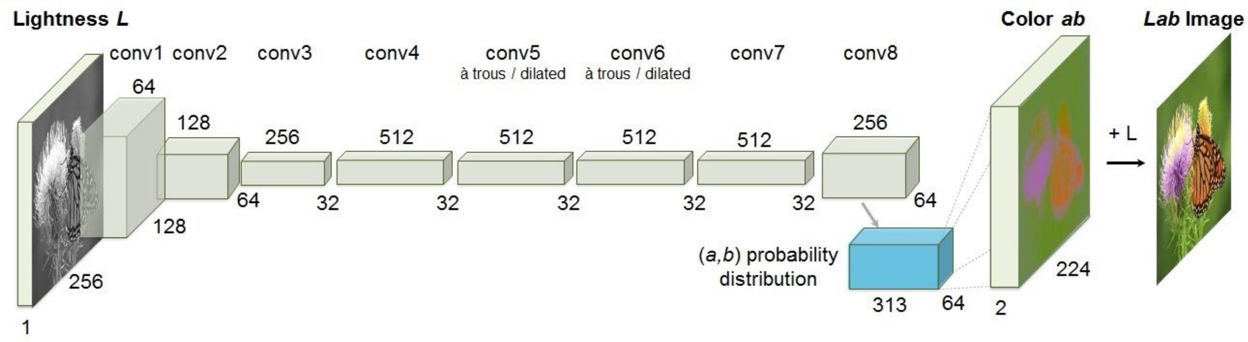
Building blocks

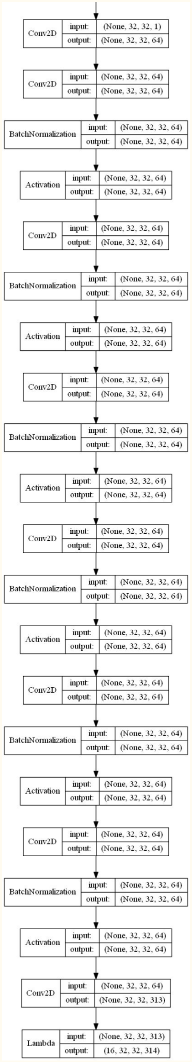
- Lab color space
- Losses
- Regression/classification

Lab color space




Regression/Classification





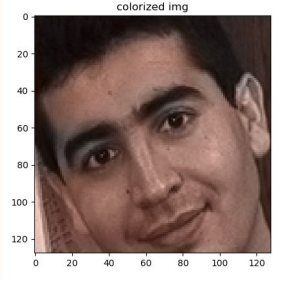
Loses

$$\mathrm{L}_2(\widehat{\mathbf{Y}}, \mathbf{Y}) = \frac{1}{2} \sum_{h,w} \| \mathbf{Y}_{h,w} - \widehat{\mathbf{Y}}_{h,w} \|_2^2$$

$$\mathrm{L}_{cl}(\widehat{\mathbf{Z}}, \mathbf{Z}) = - \sum_{h,w} v(\mathbf{Z}_{h,w}) \sum_{q} \mathbf{Z}_{h,w,q} \log(\widehat{\mathbf{Z}}_{h,w,q})$$

Results

Faces


colorized img
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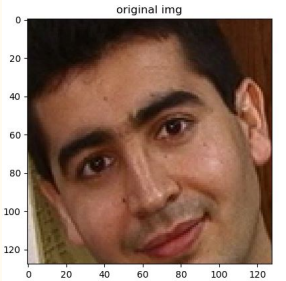
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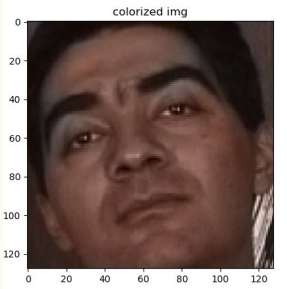
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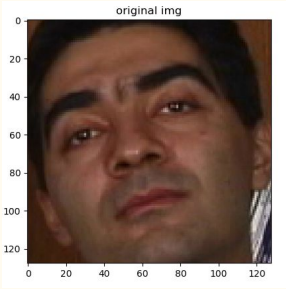
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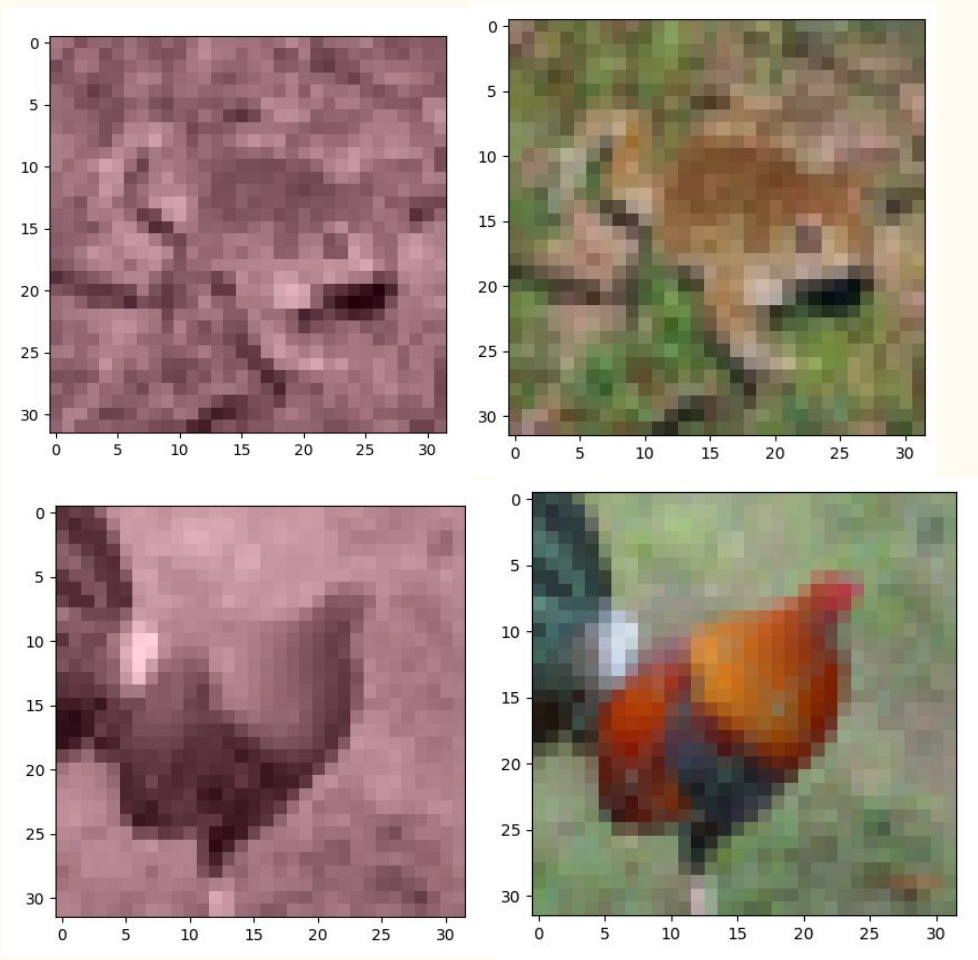
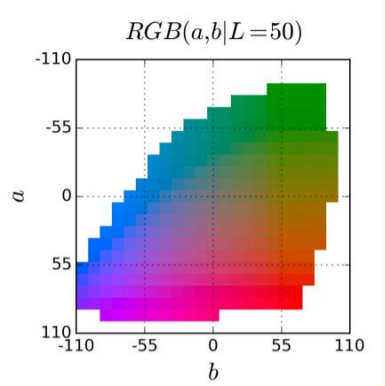
CIFAR-10



What happened?

Close to monotone.
Desaturated



Why?

- The network is too deep
- Dying ReLu