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Hands-on Deep Learning

Project 9: Super-resoltion with SRGAN

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In this project, you will increase the resolution of images in CelebA.

Project Description

This repository implements SRGAN and applies it to CelebA.

https://github.com/4m4npr33t/SuperResolution-using-GANs

It will not run out of the box, but with minimal adjustments it should be possible for you to run it in Colab.

Dataset

You can just re-use the CelebA dataset from Tutorial 7 and 8. If compute requirements are too high, feel free to shrink the dataset.

Architecture

Use the SRGAN architecture implemented in the repository above, which was proposed in this paper:

https://arxiv.org/pdf/1609.04802.pdf

If compute requirements are too high, feel free to modify the model., e.g. use less residual layers.

Tasks

- Train the default SRGAN and SRGAN with pixel shuffling (https://pytorch.org/docs/stable/generated/torch.nn.PixelShuffle.html) for 15 epochs. Plot the training progress and compare them.
- Compare your models to the pre-trained model provided in the repository. Is 15 epochs of training sufficient?
- For your presentation / report: Explain the SRGAN architecture and explain the concept of pixel shuffling.
- Have a look at the 'Quality Criteria' from the lecture to improve your project.