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DI INGEGNERIA
DELL'INFORMAZIONE

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Project proposals

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Image Recoloring with conditional GANs

- **Reference paper:** Phillip Isola et. Al. “Image-to-Image Translation with Conditional Adversarial Networks”, CVPR 2017

Image Recoloring

Image recoloring is the task of assigning RGB values to grayscale pixels.
Since this is an ill posed problem (multiple colored images can produce the same grayscale image) it can be tackled by a generative framework that can produce an image with high likelyhood.

Main Required Steps

1. Choose a Dataset and write the Dataset class to transform the images to grayscale.
2. Implement the UNET Autoencoder.
3. Implement the patch GAN.
4. Setup the losses and train the system.
5. Improve the model with some of the suggestions or propose something yourself.

Possible Datasets and Suggestions for Improvements

- Possible Datasets: ImageNet-1000, Coco, other colored datastets with enough variability.
- Possible Improvements

1. Use additional perceptual losses (see Torchmetrics).
2. Implement the W-GAN training mechanism.
3. Autoregressive decoder (see PixelCNN). Careful, this solution has high computational complexity.