Advanced Machine Learning

Exercise 04 - Project Proposal

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2 Final Project Topics

First project idea

As first choice we would like to implement a colorization method, that takes greyscale images and transforms it into a colored image.
As dataset we can use any image dataset. For example we could use CIFAR-10 [3] for small images (32×32) or the tiny imagenet dataset [2] with twice the size (64×64). We should definetly start with smaller images as a proof of concept and if we have time and enough recources we could even retrain the model on the ImageNet (265×265).
There have been a number of different models that have been trained successfully on the task of colorization. We could use a U-Net [1, 5] or a GAN structure [5].
Regarding the needed resources, we know that with a GPU with 12G or 24G memory the it is possible to get good results [5]. The implementation here was trained with CIFAR-10 and the Places365 [6] dataset which can have a resolution up to 512×512. If we are able to train the model using Google Colab (the problem will be the size of the dataset) we could use the GPU Tesla K80 with 12G memory or a similar GPU.

Second project idea

Our second project choice is the generation of a day-time image from taa picture taken at night-time. Our approach to achieve this would a cycle-consistent adversarial network [7]. We want to use the Transient Attributes Database [4] which contains labels specifying daytime, season etc. which can also be used (if we have enough time) to try out e.g. change of season. Concerning resources we do not have know whether the GPU given in Google Collab will be sufficient.

References

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