KTH Royal Institute of Technology
DD2424 - Deep Learning in Data Science
Group 71 - Project Proposal

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Title: Generating fake human faces with DCGAN.

Description: The proposed project has as its main goal exploring the generative capabilities of GANs (Generative Adversarial Networks), particularly Deep Convolutional Generative Adversarial Networks (DCGANs). For that we will use as reference the paper "Unsupervised Representation Learning with Deep Convolutional Generative Adversarial Networks"[1]. This network will be trained in order to generate fake human faces.

Training data: The initial idea is to use a large-scale dataset composed of celebrities' images[2]. This is an unsupervised representation problem, so based on these images the network will generate a new (fake) set of faces.

Software: We will mainly use *Python* and *Tensorflow* (TF).

Planning: The capabilities of the DCGAN are vast, but we plan to focus mainly on the face generation experiment. However, some additional experiments may be required to obtain the optimal performance from our network. For this, we are planning on taking advantage of the already built functions that TF flows, but otherwise the code will be mostly implemented by us.

Goals: The goal for this project is to obtain fake human face images, so having that in mind we would consider this it as successful if the generated images are as realistic as possible. In terms of skills each group member pretends to acquire, there is a general consensus that we want to deepen our knowledge on the inner-workings of GANs and also to have some hands-on experience with industry level platforms (i.e. *Tensorflow*).

Grade: A

[1] Radford, Alec Metz, Luke Chintala, Soumith. (2016). Unsupervised Representation Learning with Deep Convolutional Generative Adversarial Networks.

[2] `http://mmlab.ie.cuhk.edu.hk/projects/CelebA.html`