

Project Proposal

Interest in GANs - image generation/transform

Idea – Adding products to videos/images with unpaired image-to-image translation using cycle-consistent adversarial networks.

Using a cycle-consistent adversarial network (CycleGAN) I plan to deepfake products into a separate video/image. This can also be used in reverse to remove a product from a video/image. As an example of the models potential and what it will be used for, I plan to swap Pepsi cans with coke cans in a gif or set of images. The long-term goal of this project includes merging with a shape transform model, however the focus of the dissertation will be image translation due to the time constraint.

I have completed Andrew Ngs Coursera specialization on machine learning and neural networks over the summer break from which I have gained a solid foundation of the concepts involved and developed a significant interest in machine learning. Generative Adversarial Networks stand out to me as they have huge potential and are still rather unexplored in terms of their uses.

I began working on this project over summer and started building the foundations of the model, as well as research related to it. I have created datasets that have been saved as numpy arrays of correct shape, placed in a Tensorflow dataset and pre-processed ready for use in the model, although I need to take some more time to compile more data throughout the year for the best possible results. I know how the model works and the stages involved in building it but guidance on some of the technical details will go a long way to the success of my dissertation.

I also have a connection at GraphCore who may be able to provide me access to one of their IPUs which would be a fantastic opportunity and a great learning experience for everyone involved.

Some of my research and notes are already on my blog that I urge you to visit - <https://deepads.ai/blog/>

Since submitting this proposal for the allocation process, I have tested my datasets in a basic cyclegan model based on the tensorflow implementation and the results were promising. I plan to use this as the groundwork and build my own components on top to get the best results possible in the time frame. The coding section of the project should be completed by Christmas or early new year to allow a few months to complete the written section.

The next stage is to research efficientnet to use in the model in place of the resnet architecture used in the cyclegan paper (<https://arxiv.org/pdf/1703.10593.pdf>). Efficientnet should perform better and provide a unique feature to my implementation given that it works as expected.