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CS231N Project Proposal

If I CAN then AI GAN too: Generative Art

As we develop machines capable of conquering all tasks humans might, an interesting field lies still mostly unconquered - creativity. One such sub-field is the automatic generation of artwork. This quarter I hope to combine my backgrounds in Art, Art-History, and AI to develop a software that can utilize its knowledge of human aesthetics and aesthetic beauty and develop its own artwork.

I am combining readings on GAN's, Neural Style Transfer, and "Neural Representations of Sketch Drawings" to explore the field of generative art machines and style recognition in hope to translate that into style creation itself. Here is a list of links to papers I have found so far:

https://research.googleblog.com/2017/04/teaching-machines-to-draw.html
https://towardsdatascience.com/gangogh-creating-art-with-gans-8d087d8f74a1
https://arxiv.org/pdf/1702.03410.pdf
https://arxiv.org/pdf/1706.07068.pdf
http://cs231n.stanford.edu/reports/2017/pdfs/322.pdf

I will be using the WikiArt dataset to train my networks.

I will be using GANs (AC-GAN) to explore what initializations might produce the best visual output (by this I imply the most indistinguishable from human artwork). I will also be experimenting on how larger input training images will allow for better performance by using the Google Cloud GPU ability granted by our class credits. I might also try to create my own GAN extensions/variations to create the best visual outcomes.

There are two ways I have seen that attempt to measure the performance of the images output by an artwork generating GAN:

1. Doing a human interactive poll to determine how visually indistinguishable the artworks are from that of their human counterparts.
2. Feeding the results into an image classifier that can determine the quality of the generated images (This could be a KNN classifier that measures the log likelihood of an individual image and the training set)

Note: I posted on piazza that I will be combining this project will my final project for my CS229A (Applied Machine Learning) class. In this class I will be developing the GAN that produces artwork and in CS229A I will be developing the classifier that I will attempt to use to inform my GANs performance.