AFRIGAN: African Fashion Style Generator using Generative Adversarial Networks (GANs)

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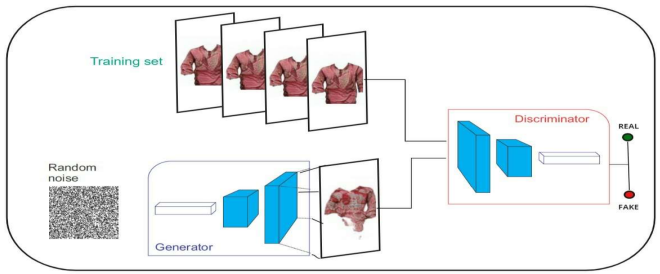
ABSTRACT

Afrocentric fashion images suitable for machine learning tasks are not well represented in open datasets. In this work we present AFRIGAN, a generative adversarial model for contemporary African fashion images. AFRIGAN can be leveraged as a tool for realistic image data synthesis, design iteration and experimentation for contemporary African fashion styles. This model is openly available.

INTRODUCTION

Generative Adversarial Networks(GANs) are neural networks that take random noise as input and generate outputs that appear to be a sample from the distribution of the18training set. GANs achieve this by training two models simultaneously. This work presents AFRIGAN a generative adversarial network model for generating realistic contemporary African Fashion Images. There has been a number of interesting work done with GANs in fashion, but they are not Afrocentric. As at the time of this project, the closest related work that explores the use of GAN in African art ,was generate new African masks. AFRIGAN is designed both as a tool for image synthesis but a domain specific work where others can share the experience of the practical application of Artificial Intelligence in African fashion. This model was trained on the AFRIFASHION1600 dataset, this dataset has 1600 images and 8 different classes of African fashion images[14] and based on StyleGAN architecture for its state of art performance in data-driven unconditional generative image modeling.

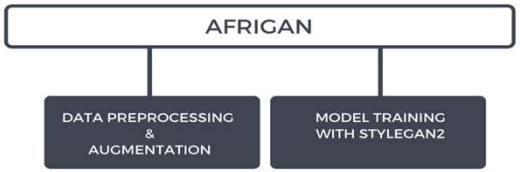


METHODOLOGY

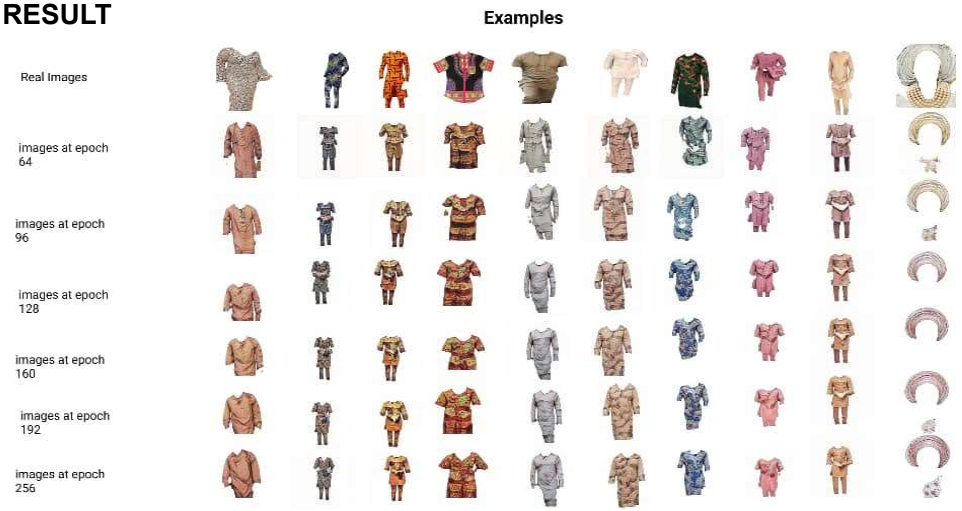
Data Preprocessing and Augmentation: All training images from AFRIFASHION1600 dataset were resized to 512 X 512 and formatted as Tensorflow Records. Data augmentation such as mirroring, hue and saturation.

Model Training: The available dataset is limited in size so transfer learning was leveraged. The model was trained using the Tensorflow Implementation of styleGAN2, weights from a pretrained styleGAN2 model trained on faces were loaded and fine -tuned on the preprocessed dataset.

Training time and Epochs: A total of 256 epochs were trained using Google Colaboratory notebook GPU and checkpoint saved, each epoch trained for an average 60 minutes.



RESULT



The figure shows the progression of AFRIGAN at defined epochs on the same image sample. At only 64 epochs the model generated realistic looking images and as expected with further training there was improvement in image resolution.

CONCLUSION

In this work we presented AFRIGAN, a generative adversarial network model for generating realistic African fashion images. The model, code and how to use are openly available.

REFERENCES

1. Victor Dibia. Art + ai — generating african masks.
2. C. Y. Gao Z. Su. R. Cui, Q. Liu. Deepfashion: Powering robust clothes recognition and retrieval with richannotations. InProceedings of the IEEE international conference on computer vision, page 1096–1104.