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AFRIFASHION40000: A GAN generated African Fashion Dataset for Computer Vision

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Abstract

We present AFRIFASHION40000, an openly available dataset of African fashion images generated using Generative Adversarial Networks (GANs). This work explores the practical application of Artificial Intelligence to contemporary African art for new designs, image data synthesis, and representation in computer vision tasks. This is a sequel to AFRIFASHION1600, a small dataset of contemporary African fashion images. AFRIFASHION40000 contains 40000 images with a dimension of 128 X 128 for each image in 8 classes of items. An interactive interface and download link are available here.

1 Introduction

Computer vision has a broad range of applications for intelligent fashion from synthesis, detection to recommendation and analysis. These applications include tasks such as style transfer,matching,item retrieval,landmark detection,style learning,popularity prediction[1]. In an analysis of fashion meets computer vision, an in-depth survey of how computer vision is being leveraged for fashion, about 126 benchmark datasets were referenced for different use cases and there was none specific for African fashion[1]. While this is not malicious, Africa is a broad and culturally oriented continent with varying clothing styles and textiles among its countries. This work is part of our deliberate effort to ensure visibility, inclusion, and availability of contemporary African fashion datasets. It is a sequel to AFRIFASHION1600, a contemporary African fashion dataset curated for computer vision tasks. The major drawback with AFRIFASHION1600 is the size, the dataset is only 1600 images in 8 different classes of clothing items[4].

Since the introduction of Generative Adversarial Net as a framework for the generative model in 2014[2], it has been found to be able to generate better synthetic images than previous generative models[3]. AFRIFASHION40000 leverages AFRIGAN, a Generative Adversarial Network (GAN) trained using transfer learning from StyleGAN on AFRIFASHION1600[4]. Using GAN enabled the team to generate realistic-looking African fashion image styles with clean backgrounds.

2 Methodology

AFRIFASHION40000 was curated from random seeds generated from AFRIGAN[1], a generative model for African fashion images. Seeds are indexes of points in latent space which GAN models

[1] https://git.io/JzTew

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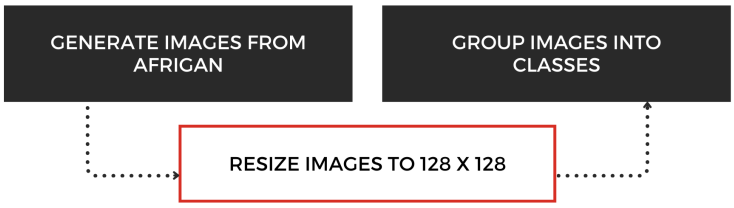

Figure 1: Process flow for AFRIFASHION40000 Curation

generate and continuously improve while training. There were 8 distinct classes of items namely African Blouse, African Shirt, Wrapper and Blouse, Agbada, Gele, Buba and Trouser, Skirt and Blouse, and Gown in the preceding AFRIFASHION1600 dataset but while using AFRIGAN to generate new images, there was a close similarity between the generated images for Skirts and Blouse and Wrapper and Blouse. So the Wrapper and Blouse class was dropped in AFRIFASHION40000 and replaced with an undefined class of every other generated images that do not fit a distinct class. All images were resized to 128 X 128 to maintain uniformity and Figure 1 shows the process flow for the methodology.

3 Result and Discussion

AFRIFASHION40000 contains 40000 images with dimension 128 X 128 in 8 item classes, 7 classes are similar to the classes in the preceding AFRIFASHION1600 dataset while there is an extra class with undefined images. These undefined images do not belong to any of the predefined classes. AFRIFASHION40000 is an imbalanced dataset because it was generated using unconditional GAN and seeded randomly but there is enough representation for each class in the dataset. There is a split of the dataset into 22000 unsorted and 18000[2] sorted into the following classes: **Gown - 4610, African Shirt - 3568, Buba and Trouser - 3373, Gele - 2420, Agbada - 2007, Skirt and Blouse - 978, Other styles - 546, Blouse - 538**. Figure 2 shows some samples of generated images in each class. The neatly curated dataset with access to an interactive web page powered by IBM's Carbon Design System for Axure-RP V10 [3] for the display of samples of the generated images is available here [4]. Clicking on any of the images displays similar images from the same class.

Figure 2: Class names and sample images for AFRIFASHION40000 dataset

[2]We appreciate Oreoluwa Babatunde, Temiloluwa Popoola and Temiloluwa Aina for their meticulous work in sorting part of this dataset

[3]https://git.io/JzTte

[4]https://git.io/JzTJU

4 Conclusion

We presented AFRIFASHION40000, an openly available GAN-generated African fashion dataset for computer vision tasks. The work shows the practical application of Artificial Intelligence to creativity in design, image synthesis, and availability of African fashion datasets.

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