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MONA MAGHRABY

GANKIN: GENERATING KIN FACES USING DISENTANGLED GAN

By

Fady Saad Said Ghatas

A Thesis Submitted to the
Faculty of Engineering at Cairo University
in Partial Fulfillment of the
Requirements for the Degree of
MASTER OF SCIENCE
Computer Engineering

FACULTY OF ENGINEERING , CAIRO UNIVERSITY
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Under the Supervision of

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Title of Thesis:

GANKIN: Generating Kin faces using disentangled GAN

Key Words:

GAN; Kin Generation; GAN Modularity; CNN;

Summary:
Kin image generation from parents' images is a high-level prediction and generation problem. This study presents a new method to predict and generate a kin face using parents' faces, i.e. Tri-subject prediction or two-to-one prediction. We use a pipeline of unconditional GANs to overcome mode-collapse in conditional GANs. The model achieves promising results compared to the state-of-the-art, our model achieves a retrieval score of 0.19 versus 0.107 by the state-of-the-art. Our model is validated against SelfKin kinship verification model and achieved an accuracy of (63 % ± 7 %).

Disclaimer

I hereby declare that this thesis is my own original work and that no part of it has been submitted for a degree qualification at any other university or institute. I further declare that I have appropriately acknowledged all sources used and have cited them in the references section.

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List of Symbols and Abbreviations

AI .... Artificial Intelligence
CIFAR .... Canadian Institute For Advanced Research
CNN .... Convolutional neural network
DeepID .... Deep Identity Network
FIW .... Families in the Wild
GAN .... Generative Adversarial Network
HOG .... Histogram of Oriented Gradients
IMDB .... Internet Movie Database
KNN .... K-Nearest Neighbor
LBP .... Local Binary Patterns
NN .... Neural Network
MNIST .... Mixed National Institute of Standards and Technology
PGGAN .... Progressive Growth of Generative Adversarial Network
RFIW .... Recognizing Families in the Wild
SBM .... Symmetric Bilinear Model
SIFT .... Scale-Invariant Feature Transform
SVM .... Support Vector Machine
VGGNet .... Visual Geometry Group Network
WGAN .... Wasserstein Generative Adversarial Network