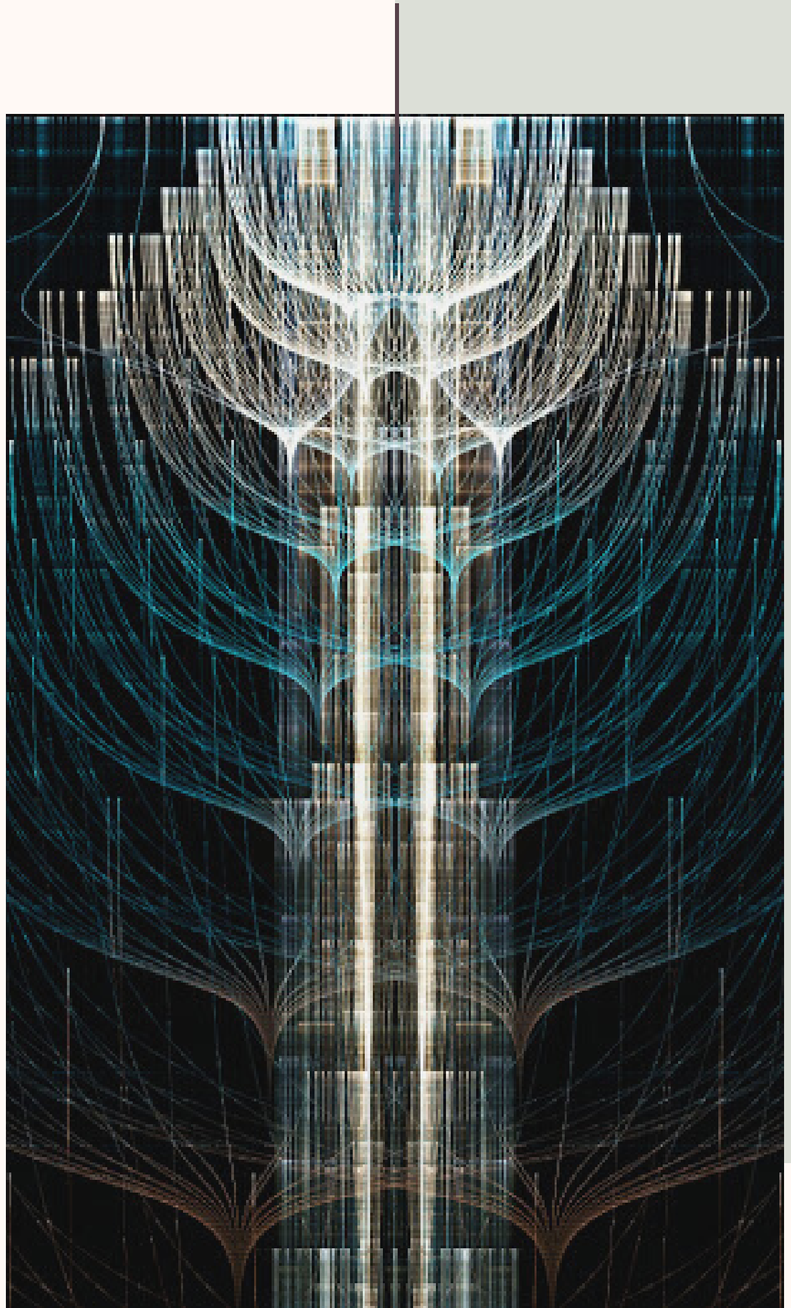


Training GANs with Stronger Augmentations via Contrastive Discriminator

by Harum Naseem Bhinder & Muhammad Raahim Khan

Background Literature

THE GAP BETWEEN SUPERVISED AND UNSUPERVISED LEARNING CAN BE SIGNIFICANTLY CLOSED BY LARGE SCALE CONTRASTIVE LEARNING

ACTIVE RESEARCH CONDUCTED ON VARIOUS DATA AUGMENTATION TECHNIQUES

PROBLEM STATEMENT

DESPITE ALL THE ACTIVE RESEARCH, STILL UNCLEAR WHICH AUGMENTATIONS COULD ACTUALLY IMPROVE GANS

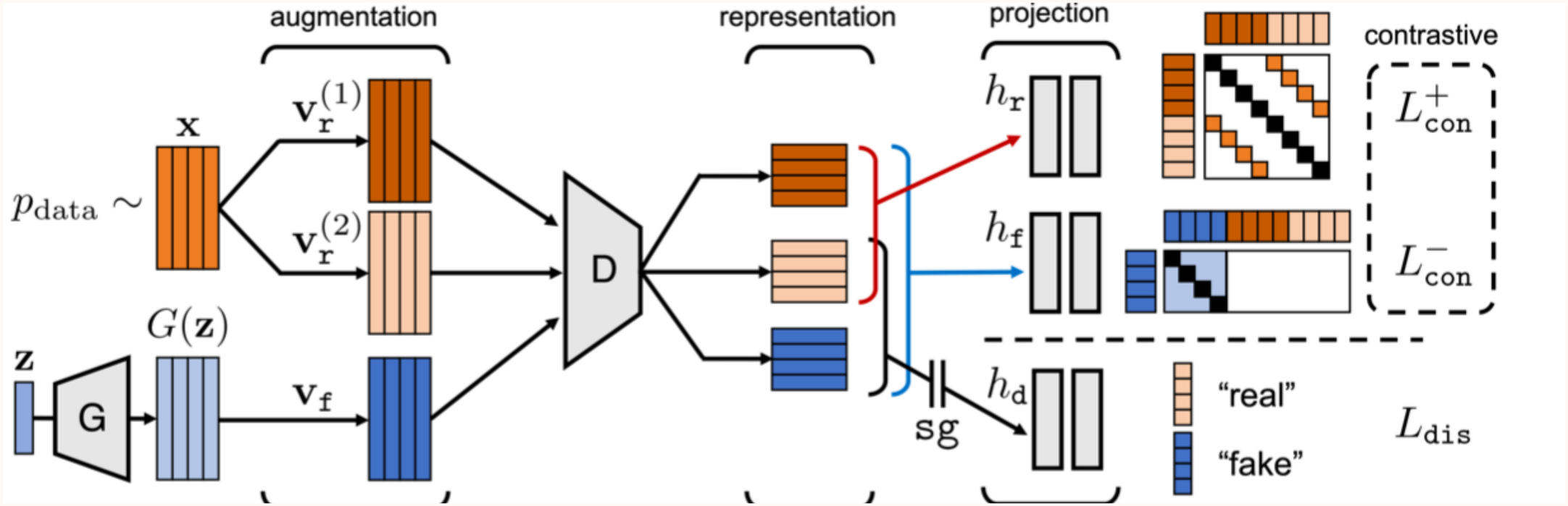
Why is it important?

WE CAN TRAIN THE MODEL TO LEARN A LOT ABOUT OUR DATA WITHOUT ANY ANNOTATIONS OR LABELS

LEARN THE HIGH-LEVEL FEATURES OF THE OBJECTS IN OUR WORLD

SOLUTION PROPOSED

SUGGESTED INCORPORATING A CONTRASTIVE REPRESENTATION LEARNING SCHEME INTO THE GAN DISCRIMNATOR CALLED CONTRAD



ARCHITECTURE

THE ENCODER NETWORK IS TRAINED TO MINIMIZE 2 CONTRASTIVE LOSSES AND IS THEN MERGED UNDER THE STANDARD FRAMEWORK OF GAN

How is it different?

ENABLES THE DISCRIMINATORS TO WORK WITH MUCH STRONGER AUGMENTATIONS

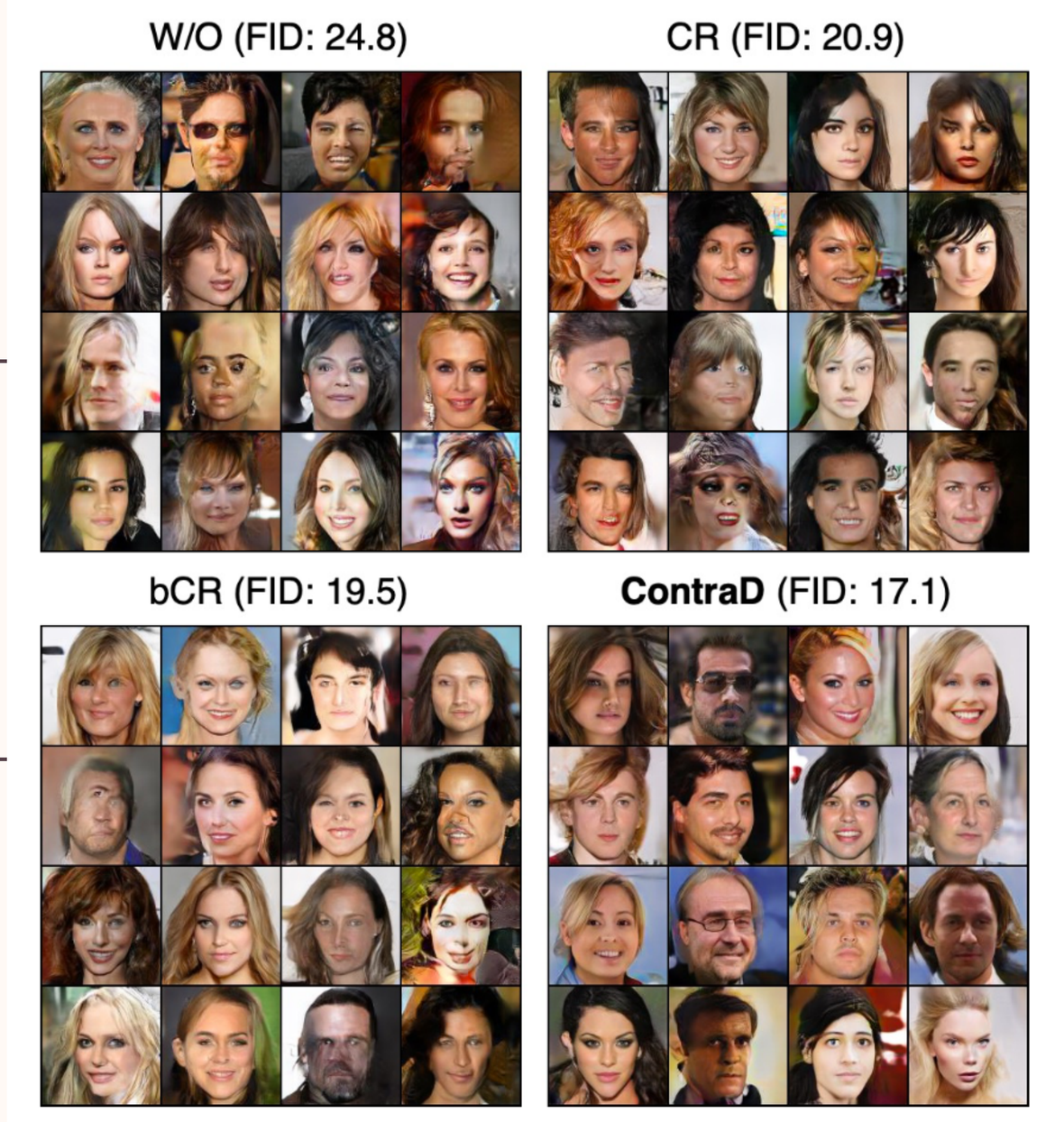
DOES NOT INCREASE THE TRAINING INSABILITY AND SO PREVENTS DISCRIMATOR OVERFITTING

Results Demonstrated

GANS WITH CONTRAD CONSISTENTLY IMPROVED FRECHET INCEPTION DISTANCE (FID) AND INCEPTION SCORE (IS)

MAINTAINED HIGHLY DISCRIMINATIVE FEATURES IN THE DISCIMNATOR IN TERMS OF LINEAR EVALUATION

Results Demonstrated



GANs trained in an unsupervised manner can induce many conditional generative models via a simple latent sampling by leaveraging the learned features of ContraD

OTHER CONTRIBUTION

Limitations

NO LIMITATIONS WERE POINTED OUT BY THE AUTHORS AND DUE TO THE LACK OF DEPTH IN THE METHODOLOGY STEPS WE DIDN'T HAVE ENOUGH BASIS TO DEDUCE LIMITATIONS

Future Work

PROPOSE AN IDEA OF INCORPORATING FAKE SAMPLES FOR CONTRASTIVE LEARNING

FURTHER EXPLORE MINIMIZING GAN LOSS BY ADDING A SMALL HEADER

THANK YOU!