
Generative Models Lab

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Acknowledgment

- Some Slides taken from Assignment 7 pdf.
- Some Slide taken from lecture 15 (generative models)

Generative Models

- A powerful way of learning any kind of data distribution using unsupervised learning and it has achieved tremendous success in just few years.
- Used to generate more data for your supervised learning tasks.
- Used for Augmentation.



Problem Statement

building a facial detection model that learns the latent variables underlying face image datasets and uses this to adaptively resample the training data, thus mitigating any biases that may be present in order to train a debiased model.



Our Goal

build a model that trains on CelebA Dataset and achieves high classification accuracy on PPB Dataset across all demographics, and to thus show that this model does not suffer from any hidden bias.



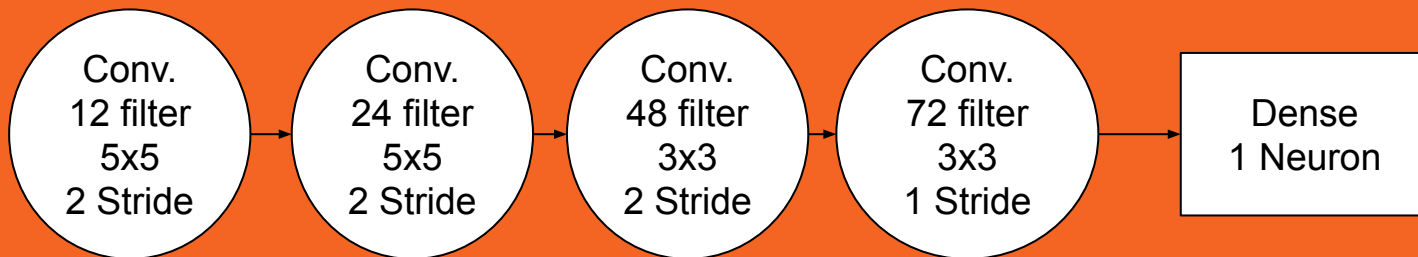
CelebA

A large-scale (over 200K images) of celebrity faces.

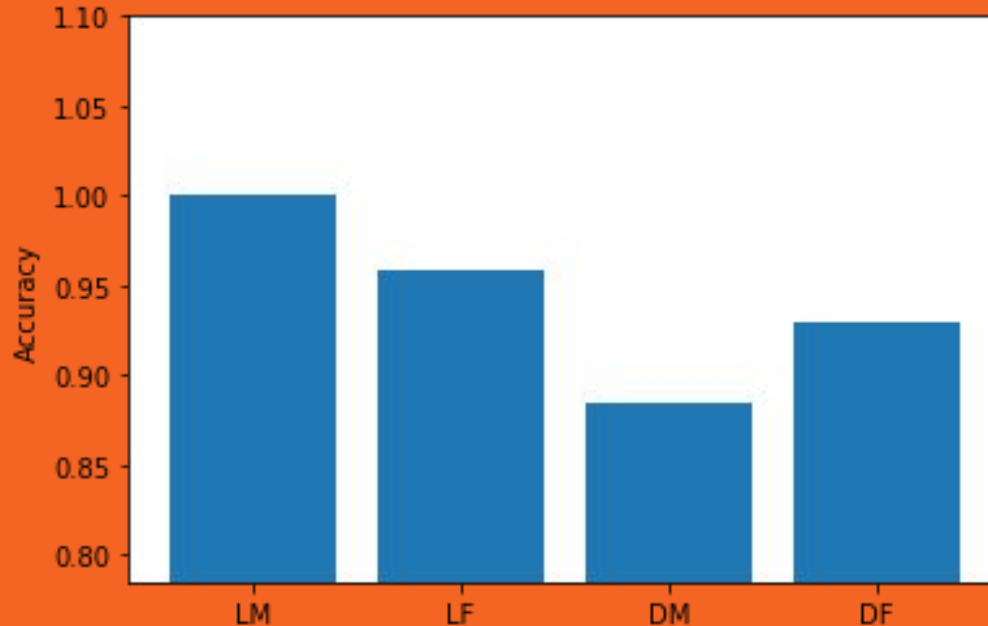
PPB

Images of 1270 male and female parliamentarians from various African and European countries and exhibits parity in both skin tone and gender. The gender of each face is annotated with the sex-based “Male” and “Female” labels. Skin tone annotations are based on the Fitzpatrick skin type classification system, with each image labeled as “Lighter” or “Darker”.

CNN Standard Classifier



Evaluation of CNN Standard Classifier





Conclusion

- Model is biased against males that their skins are dark more than Females of dark skin.
- Model is Biased to Males of light skin than that Females

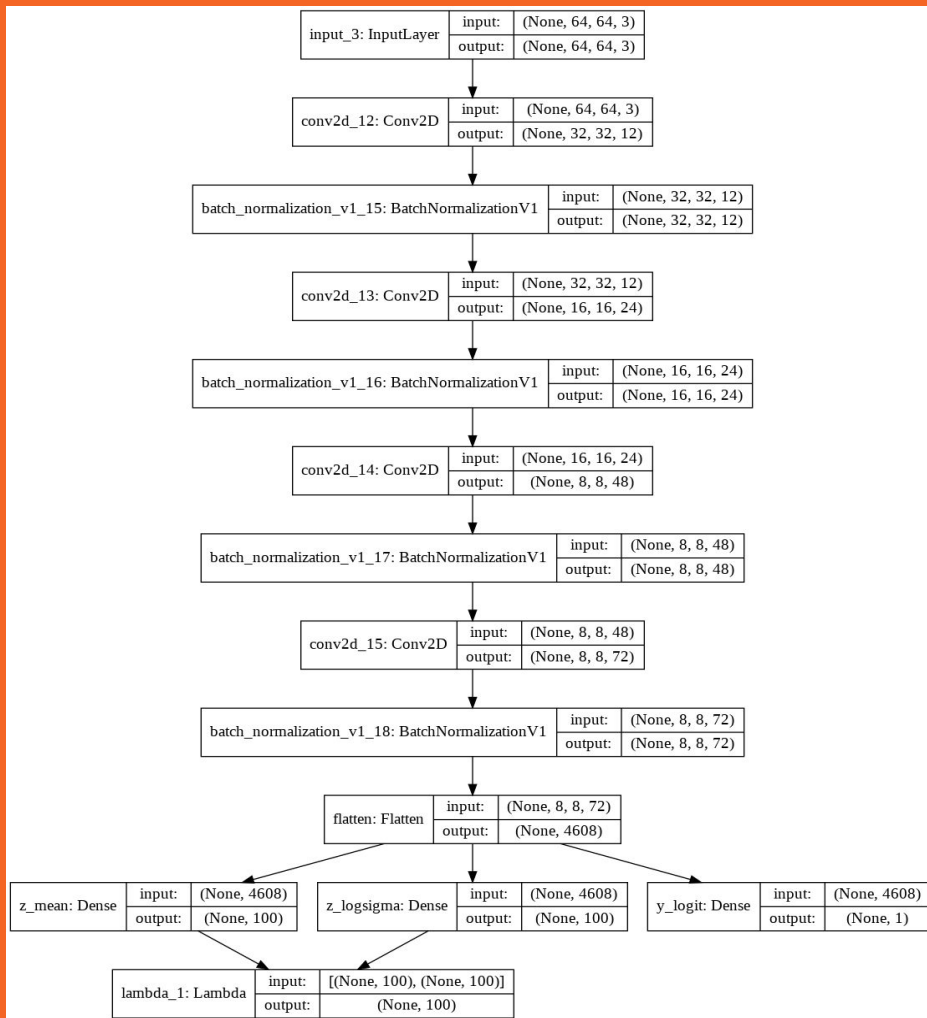


How to Solve Biasing ?

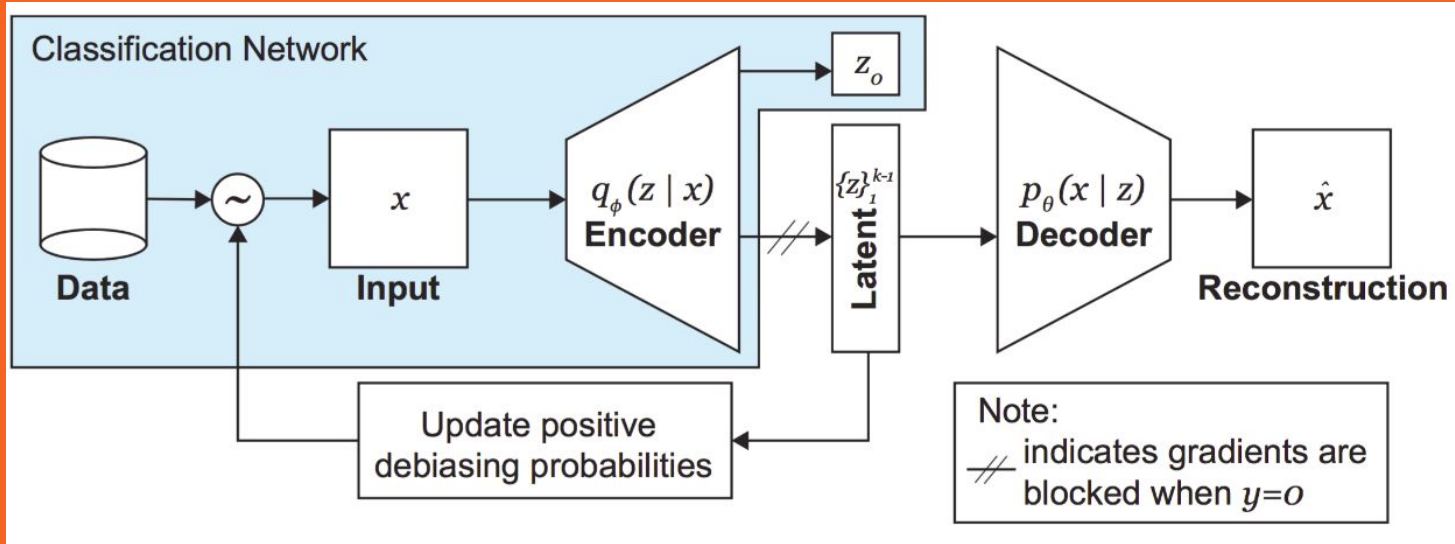
Augmentation of Data of small number of Samples.

**Using Generative Models.
(Auto Variational Encoder).**

Displaying Encoder Model

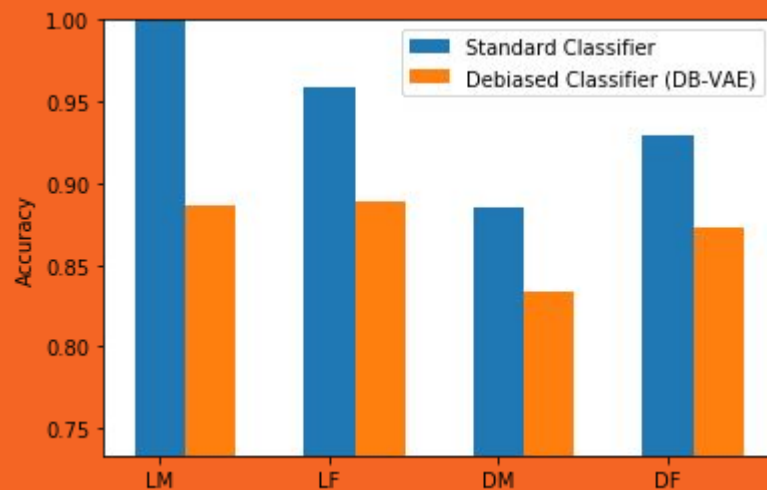


DB-VAE Model



Evaluation of DB-VAE Model

Smoothing Factor using 0.5 to get the best





Conclusion

- However model accuracy is reduced but biasing is reduced between Male and Female in case of light skin and nearly in case of Dark skin



Thank You