

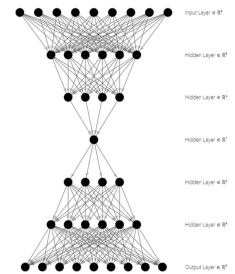
Team: 5

## Deliverable 2

### Preliminary Results

#### Description

1. The objective of this project is to enhance the resolution of the user-inputted image, producing a higher-quality output. Currently, the model is specifically designed to denoise facial shots, as it has been trained on a dataset primarily focused on this category. However, if time permits it, we could expand the model's capabilities to accommodate a broader range of user input.
2. We are still using CELEBA as our dataset which can be conveniently imported from torchvision, it is equipped with over 200,000 celebrity images. Given our assumption that these images are already high-resolution, our preprocessing approach involves employing an autoencoder to selectively reduce image quality. Leveraging the latent space structure, we can achieve this by choosing any layer preceding the output layer.
3. We have not changed our model and we will still be using an autoencoder.
  - a. The framework used is PyTorch, The autoencoder will be implemented using PyTorch's built in layer framework (nn.Conv2D, nn.ReLU, etc.).
  - b. As of right now we have no reasoning to adjust the splits, and chose our working splits based off of convention.
  - c. We have not yet implemented a validation mechanism. We believe our current model is overfitting our data, meaning it is our next important step, hoping to combat our overfitting.
  - d. We are still unable to use our preferred dataset of CELEBA and therefore had to use a smaller dataset to implement our model. (<https://www2.eecs.berkeley.edu/Research/Projects/CS/vision/bsds/>)
4. Our current loss is extremely low, but our PSNR, the most commonly used metric for this area, is not yet in a good range, implying our data is either being overfit, or our low res versions of our set are not low-res enough.



#### Preliminary Results

Epoch 1, Loss: 0.06252001311916572  
Epoch 2, Loss: 0.03612656748065582  
Epoch 3, Loss: 0.01573749280606325  
Epoch 4, Loss: 0.010797454402423821  
Epoch 5, Loss: 0.00899455975741148  
Epoch 6, Loss: 0.008100843558517786  
Epoch 7, Loss: 0.007667918223887682  
Epoch 8, Loss: 0.00740544512294806  
Epoch 9, Loss: 0.007058728880320604

Epoch 10, Loss: 0.006605332574019065

Finished Training

Average PSNR on the test set: 21.95 dB

5. We still need to implement the CELEBA dataset. We are planning to move our model to Colab, allowing us to access more computing power and in turn work with the larger dataset. We need to implement a validation mechanism for our model, combatting overfitting, as well as hyperparameter tuning. We also need to implement an interface to visualize the outputs our model is generating.