Resources used:

Facial beauty: <https://arxiv.org/abs/1801.06345>

McCormack: <https://arxiv.org/pdf/2004.06874.pdf>

Other:

Simplified explanation of facial beauty paper: <https://towardsdatascience.com/how-attractive-are-you-in-the-eyes-of-deep-neural-network-3d71c0755ccc>

How to run the code:

Navigate to the folder that contains the csv file of aesthetic evaluation. This is an edited csv file where all the tables are concatenated together so that everything is in one table and we can access all the images from just one column.

Eg. *os.chdir('D:\some\_random\_folder\BeautyRated.csv')*

Like this: [BeautyRated](https://docs.google.com/spreadsheets/d/1W0LiQ2FXkV_SJHWkTSW7wVt4JgIpiAt_jrLQJ0bo-E8/edit?usp=sharing)

We got rid of the dates on which the images were taken as they were irrelevant in this context.

Then navigate to the images. We have brought all the images in a single folder.

Eg. *os.chdir('D:\some\_random\_folder\Bacteria\_images')*

We convert the images to size 128x128 so that it matches with the VAE output. Since we plan on coupling this model to the VAE at the end the size needs to be the same as that. This model will work as a credit assigner.

Model: We experimented with two models i.e. ResNet50 and a custom model that is not as complex. We found out that both the models perform similarly hence for now there isn’t any real advantage of using a complex model like ResNet50 we can get away with much simpler models.

This model is trained on 147 images but still the model manages to give us good accuracy.

Training: The loss plateaued around 100 epochs.

Epoch 100/100

14/14 [==============================] - 0s 30ms/step - loss: 0.0044 - val\_loss: 0.0106

As we can see the loss is really low and hence the model is able to reliably give a score similar to that of Carlos.

Confusion matrix:

|  |  |
| --- | --- |
| ResNet50:(Only last dense layer is trainable) | Custom model: |

Ideally we would like to see s diagonal like which means that the model is correctly predicting the output. As we can see in both the output the data is diagonally placed but the custom model uses significantly less parameters than the ResNet which makes it more desirable.

We want to use the output from this model for credit assignment.

Future work:

* As of now we have trained this model on 147 images and hence we weren’t able to have sizable test images. Hence once we have enough images we can create a more reliable output confusion matrix.
* We plan on creating a combination of two models that will be able to categorize the images into more subjective rankings like smooth, essess etc. instead of an overall ranking from 0 - 100. This will help us generate images of our liking based on the properties of these images.