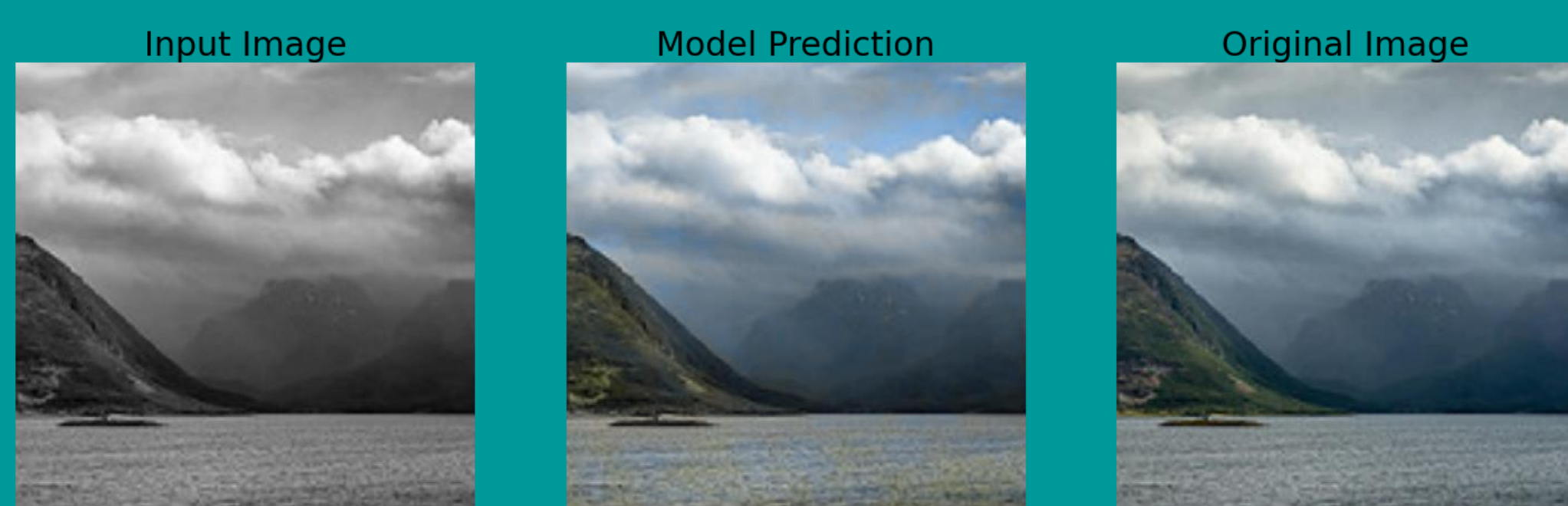


Introduction

- Coloring grayscale photos today is done by photoshop professionals and takes many hours.
- We wish to achieve better result.
- We intend to shorten the time needed.

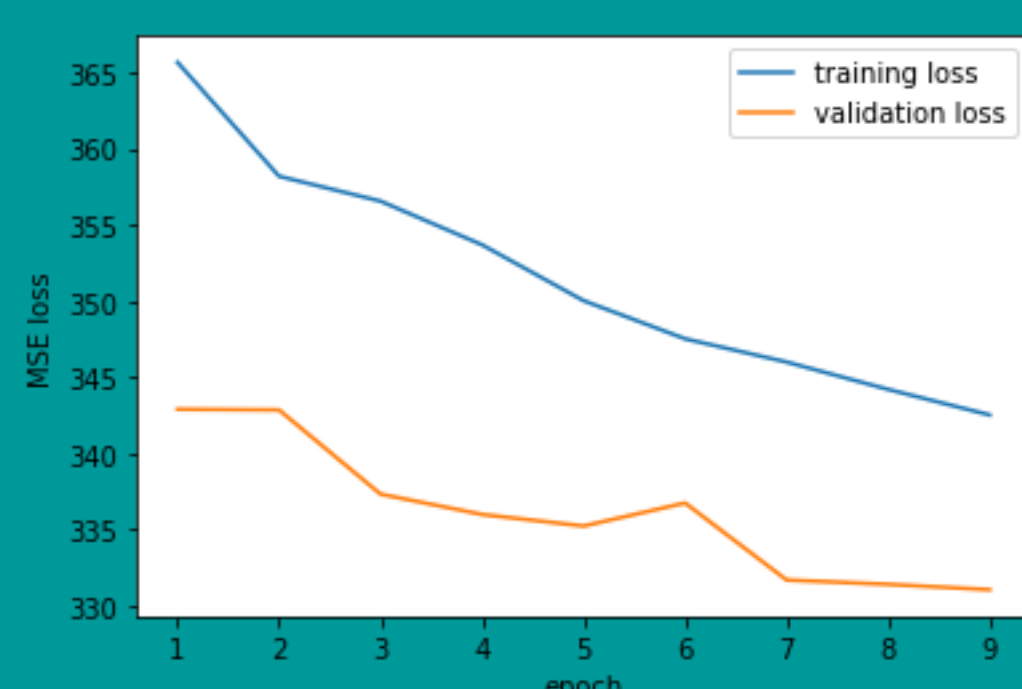
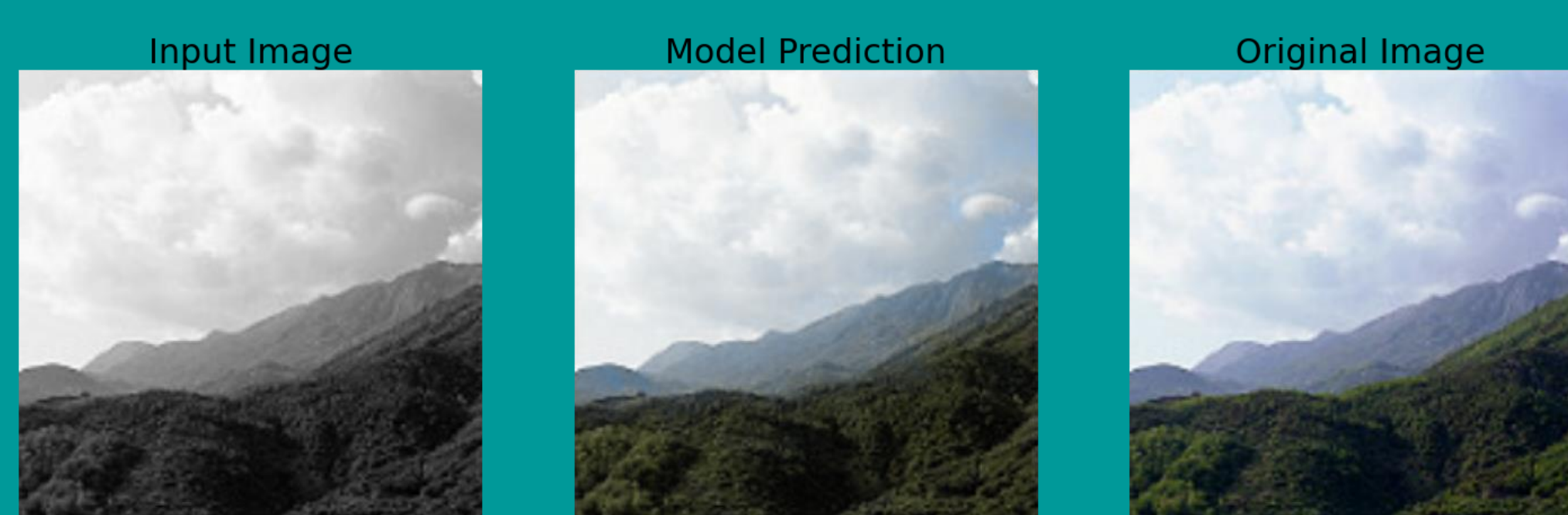


Results

- We achieved 331.0627 loss in MSE.
- The model works well with sea, sky and clouds.
- U shaped net unique architecture enhanced the performance of the model.

Method

- We split the data to train and test data by 80% and 20% respectively.
- We created an end to end solution by creating Neural Network inspired by U-Net which functioned as encoder and decoder with using skip connections to complete the loss data created by the pooling layers which contains 32 layers and 7,760,355 trainable params.
- We used ReLU as activation function, MSE as cost function and Adam as optimizer.
- The model was trained for 9 epochs.



Conclusions

- U shaped network as encoder and decoder improves the CNN performance.
- Image coloring is possible using deep learning techniques.
- Miss-colorizations of objects may occur.
- The main drawback is it is slow to train.
- The secondary drawback is there is a trade-off between localization accuracy and the use of context.
- Further research is necessary.

Discussions

Future research may include:

- Changing model hyper-parameters.
- Exploring different architectures.
- Expanding the image dataset.
- Further training of the CNN.

