Coloring B/W Images

CSE-676 Deep Learning Final Project

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Project Description

- This project utilizes deep learning techniques to automate coloring black-and-white images.
- The ultimate goal is to develop an accurate and realistic model that can predict the colors of an unseen black-and-white image.
- By doing so, not only can historical photographs be brought to life, but applications such as photo editing, and object recognition can be achieved.

Background

Colorizing black & white images has been implemented in different ways. We have referred few of the projects to understand the data and approach.

- By Emil wallner using autoencoder.
- By Moein Shariatnia using U-net and conditional GAN
- By Anne Guilbert using pix-2-pix

Dataset

Dataset has been taken from kaggle “Landscape Image colorization” dataset.

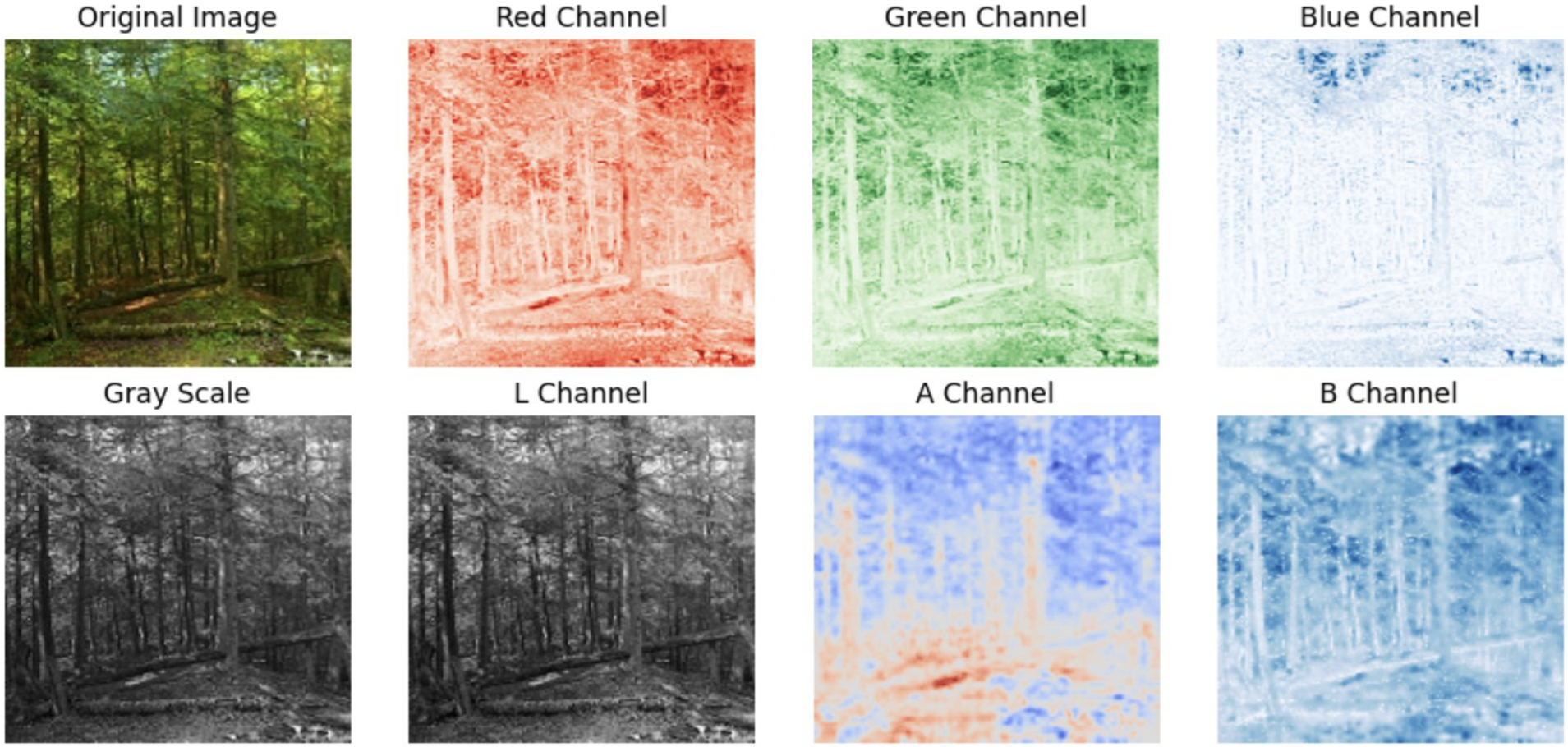
The dataset consists of landscape images in both color and grayscale formats.

It features a total of 7,129 images.

The dimensions of the images are 150 x 150 pixels.

These images do not need any preprocessing as all the images are in the same size 150x150.

Dataset

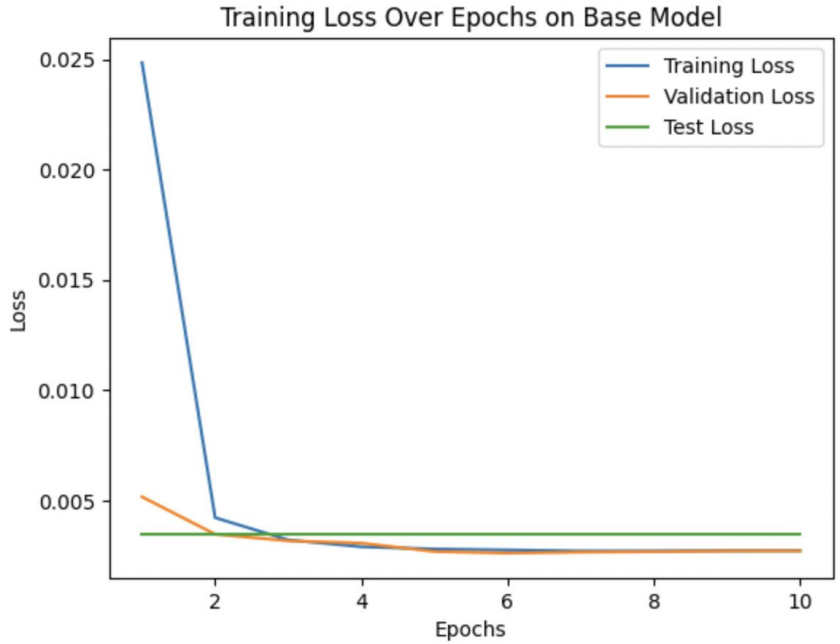

Original Image
Red Channel
Green Channel
Blue Channel
Gray Scale
L Channel
A Channel
B Channel

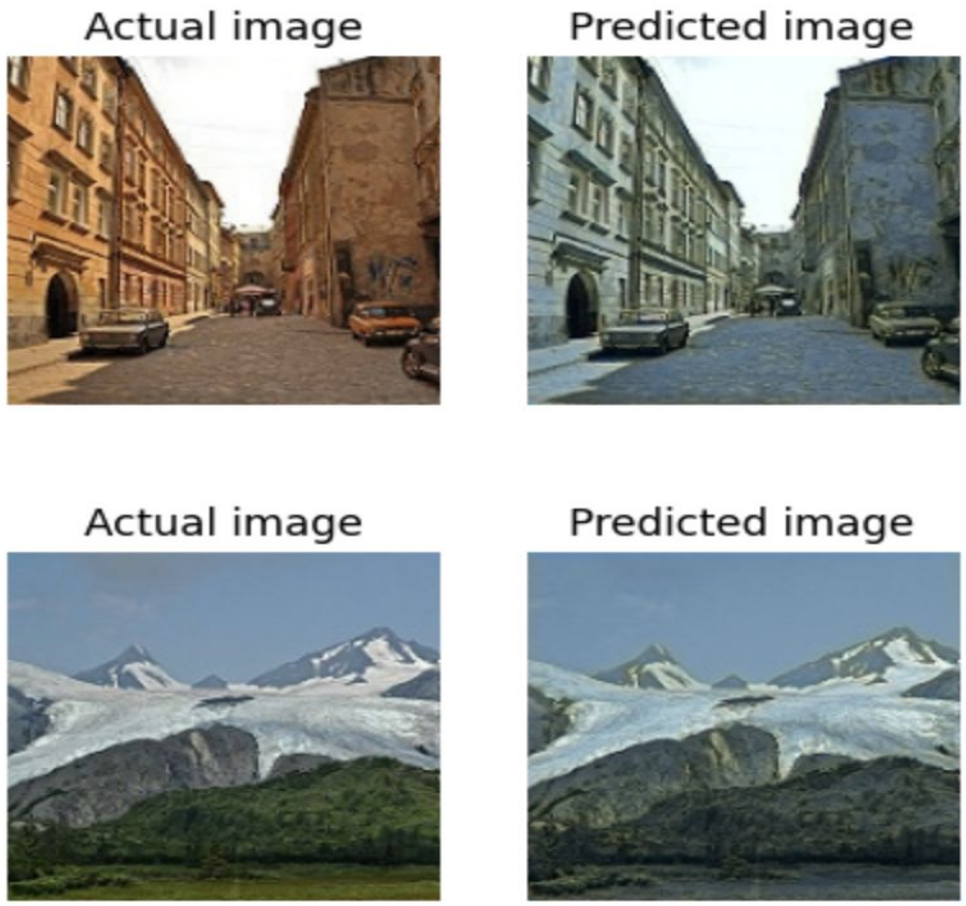
Methods

- We used deep learning model to predict the color channels A & B.
- Once A & B channels are predicted, we used them to superimpose on the L channel.
- Unlike most available model, using deep learning models that generate images like GAN.
- We implemented a CNN model, VGG model and a RESNET model to predict the channels.

Results

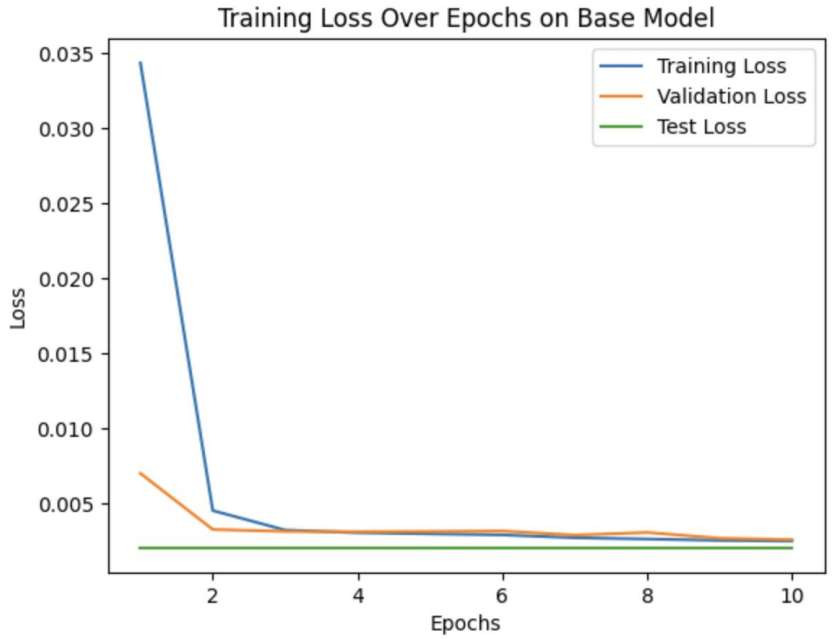
We have implemented CNN model that gave us 0.644 score on the similarity index.

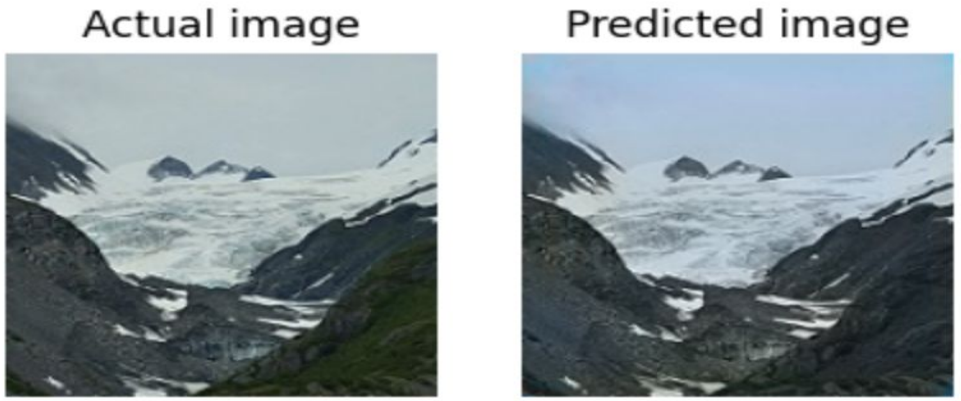


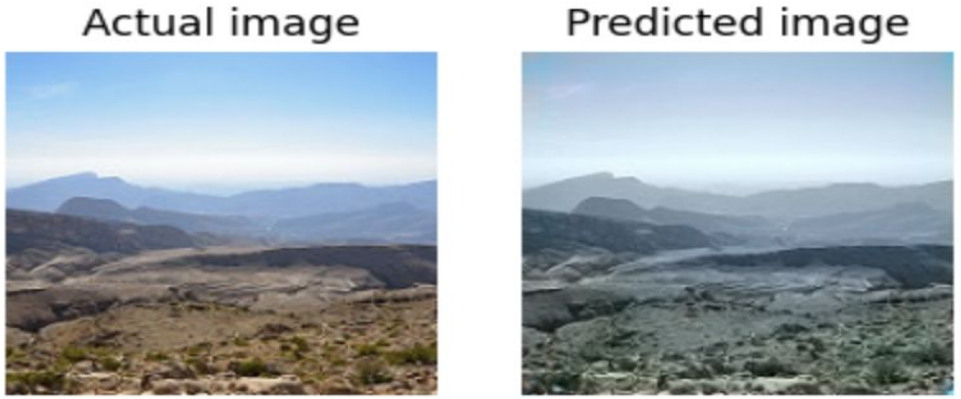


Results

We have implemented VGG model that gave us 0.733 score on the similarity index.

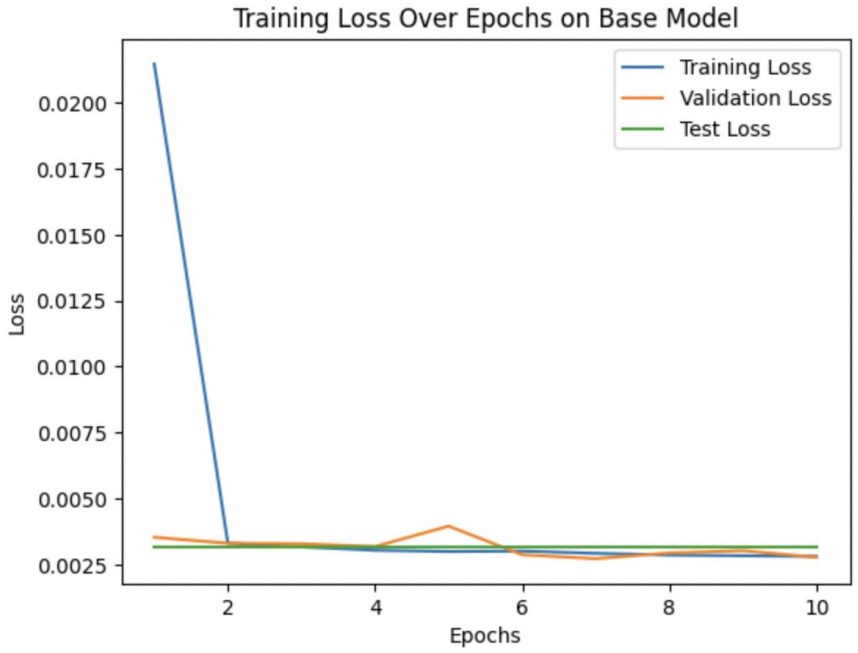






Results

We have implemented ResNet model that gave us 0.862 score on the similarity index.



Observation/Summary

The key observation is that the image generated with GAN have more realistic colors on the pixel level.

Predicting channels gives comparable result on a lighter model.

Team Contribution

Topics	Shashank Shankaregowda	Keshava Pranath Kakekochi	Neema George
Dataset	33.33%	33.33%	33.33%
Exploration	33.33%	33.33%	33.33%
Understanding the method	33.33%	33.33%	33.33%
Experimenting with dataset	33.33%	33.33%	33.33%
Data Preparation	33.33%	33.33%	33.33%
Designing CNN model	15%	70%	15%
Designing ResNet model	70%	15%	15%
Designing VGG model	15%	15%	70%
Exploring Result Comparison	33.33%	33.33%	33.33%
Documentation	33.33%	33.33%	33.33%

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Thank you

Questions ?