Colorful Image Colorization

Jun-Jul 2020 WTEF Project using Deep Learning

Priyansi, Sejal, Twisha

24 June 2020

Overview

The objective of our project is to replicate the paper on Colorful Image Colorization, by Richard Zhang, Phillip Isola, Alexei A. Efros (5 October, 2016), and add the following tweaks:

1. Apply transfer learning
2. Data augmentation
3. Changing hyperparameters
4. Expanding the dataset

The workflow is as follows:
Replicating the base model $\rightarrow$ Improving it $\rightarrow$ Making a web app $\rightarrow$ Deploying it

Technology Stack

1. Deep Learning with PyTorch
2. Flask
3. Heroku

Description

- **The Objective**: "Given a grayscale photograph as input, the paper attacks the problem of hallucinating a *plausible* color version of the photograph." - explains the Abstract. The project aims to achieve a "fully automatic approach that produces vibrant and realistic colorizations."
- **How to Accomplish it**: The problem is dealt with as a classification task and uses class rebalancing at training time to increase the diversity of colors. The system is implemented as a feed-forward pass in a CNN at test time and is trained on over a million images.

Description

- **Why This Project**: Common approaches and solutions to tackle this problem either rely on significant user interaction or result in desaturated colorizations, in an effort to restore the ground image. Hence, this project, instead of making futile efforts to restore the original colorization, aims to produce the most plausible color version.
- **Evaluation and Success**: The algorithm used in the model is evaluated using the *"color Turing test"*, where human participants are asked to differentiate between the ground image and the colorized image. The algorithm successfully fools humans in 32% of the trials.

Status

The work on the project itself has not been started yet. All three of us are still in the learning phase. We plan to start working on it within the next two days.