Color Correction Application

Introduction:

In the fashion world, capturing the right color of clothing on models via lens is a common hurdle. Even in controlled studio settings, the colours often don't necessarily translate accurately to reels. Many rely on Adobe Photoshop for correction, which demands manual effort.

Our objective was to create a web application automating the color correction process for clothing using a reference image. We delved into OpenCV libraries and methodologies, aiming for a production-ready solution. Our approach removes the need for manual intervention, providing accurate colour correction similar to what would be achieved using Photoshop, but in a more streamlined and automated manner.

Client Details:

Name: Confidential | **Industry:** Publishing | **Location:** USA

Technologies:

Photoshop, OpenCV, pandas, NumPy, Python, Rclone, Django, React, PostgreSQL

Project Description:

This tool addresses the challenge of color inconsistency on clothing when photographed on models (on_figures). It uses the actual clothing (laydowns) as the ground truth. The core of the tool is an automated Photoshop application that eliminates all manual steps in colour correction. Previously, manual intervention was needed at two stages:

1. Manually picking the exact colour from the laydown (corrected colour) is now automated using OpenCV libraries (Scikit-learn) with good accuracy.

2. Manual adjustment of intensity (highlights, midtones, and shadows) during color correction is challenging, but we automated it using OpenCV libraries (histograms) with production-level accuracy. Further testing is ongoing for continuous improvement, gaining insights, and refining the codebase.

Here's how it works:

- The application is locally hosted (frontend based on React and Backend Based on Django)
- The dataset that needs to be colour corrected is present in Dropbox which syncs with the local server where the application is hosted using Rclone.
- The UI of the application asks for the folder location in the Dropbox which needs to be batch colour corrected.
- In the backend, all the reference images are processed and their colours and gradients are calculated using OpenCV tools.

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- These values are then saved to the database against the reference images for future colour corrections.
- Then all the clothing worn by mannequins are processed and saved to the database against the clothing images.
- We use our self-made formula to then correct the deviation on colours and gradients of the clothing from that of the reference images.
- The clothing along with the corrected colour value and gradient values are sent to Photoshop using Photoshop API.
- Photoshop is then triggered for the image and applies the corrected colour and gradients values and saves it back to Dropbox.

Architecture Diagram:

We developed a Monolithic system with client-server architecture on the client's private network. The system includes a PostgreSQL database due to its fixed schema. To handle high-resolution images after colour correction, we integrated a third-party BLOB storage system for efficient file management.

To minimize network latency when dealing with large image files, we implemented a File-Sync approach on the server, making it appear as if the files are in the server's file system. Additionally, we automated several steps of a third-party Photoshop application using Python libraries.