Tones in Vogue

An Analysis of Facial Skin Tone in Vogue Fashion Photography and Resulting Implications on Standards of Beauty

Sean Gabriel Petegorsky
sean.petegorsky@yale.edu

Advisor: Holly Rushmeier
holly.rushmeier@yale.edu

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I. INTRODUCTION

Vogue Magazine is a powerhouse in the world of fashion. Since its first issue in 1892, Vogue has produced hundreds of thousands of images. Vogue’s image archive shows the history of fashion photography from the end of the 19th century to the present day. This archive is a resource of great potential value for studying culturally dominant beauty standards over a large span of time.

As the Vogue archive is extremely large, it would be daunting to try to compare images by hand. At the same time, the archive lends itself well to computational image analysis. Researchers working with the Yale University Library’s Digital Humanities department have already performed some analysis on the archive, available at the project page Robots Reading Vogue.

I will apply a face detection algorithm to the color images in the Vogue archive with the goal of finding patterns in skin tone among the subjects of Vogue’s fashion photography over the magazine’s history. I will attempt to use computational image analysis to support a commentary on how skin tone factors into dominant American standards of beauty.
II. Methods

In order to analyze the skin tones of subjects in Vogue photographs, I will implement a face detection algorithm in MATLAB and apply it to the color photos in the Vogue archive. I will develop a method for describing facial complexion computationally, whether as an average facial skin tone, a map of color gradients within the face, or another quantitative description of color. I will attempt to produce a method of normalizing the facial skin tones against the color from whole photos, in order to minimize error due to changes in color printing methods during Vogue’s long history.

My work will extend two previous student research projects from the Yale Computer Graphics Group—Christina Wong’s Vogue: An Analysis of Vogue Fashion Photography’s Implications about the Female Face, a senior project in Applied Mathematics advised by Dr. Holly Rushmeier, and Yutaro Yamada’s summer research on face detection. Wong’s project used the Viola-Jones algorithm for face detection [2]. Yamada’s research explored other algorithms to enhance performance, starting with Zhu and Ramanan’s algorithm [3] and exploring approaches utilizing neural networks, eventually implementing a neural network algorithm described by Li, et al. [1]. I will use the results of Wong and Yutaro’s projects to guide my selection of a face detection algorithm best suited to my task.

III. Deliverables

This project will produce a volume of source code for face detection and color detection, comparison, and normalization in MATLAB. The source code will include implementation of a face detection algorithm and application of the algorithm to the set of images from Vogue Magazine’s archive. It will also include code to determine the skin tones present in detected faces and search for possible trends in complexion in photos across different time periods. In order to negate possible color bias from changes in color print-
ing processes over time in the magazine’s images, the code will also include a method of normalizing the colors present in detected faces against the colors present in the entire images.

This project will produce a written report describing any trends found in facial skin tone, implications of the trends on standards of beauty and how they may have changed (or stayed the same) over time, consideration of the reliability of these trends and of limitations or sources of error, and description of the overall successes and failures of the project. Discussion of the successes of the project will include an evaluation of the performance of the face detection and color detection and comparison algorithms.

REFERENCES

