A Clash of Colorful Worlds. Distant Viewing Color in Visual Representations of the Orient and Occident, 1890-1920

Short paper

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In January 2022, a London-based trend-spotting agency predicted that Orchid Flower, 'a deep magenta', would become *the* color of 2022 (Hoffower, 2022). Almost 2000 years earlier, the Roman author Gellius described the color *aureus* as 'the red of gold.' (Eco, 1985). In 1832, sailing on the *Beagle* off the coast of Brazil, Charles Darwin noted that the sky was a mixture of 'Berlin [blue] with [a] little ultramarine.'

Would Darwin have an idea of Orchid Flower or Gellius of Berlin blue? From the early nineteenth century onwards, scientists began to view color as natural and static (Crary, 2004). However, as the fragments above show, our experience of color can change drastically. Visual culture scholars have described the perception of color as an elusive part of a specific historical 'visuality' (Crary, 1992), which is shaped by the interaction between human observers, the world they have access to, and the optical instruments they use. Focusing on the first two elements, Eco (1985) noted that the relatively small number of colors we see, or rather name, stems from their usefulness in everyday life.

How can we study the historical experience of color? It is challenging to spot general trends in color use by examining a small number of images, especially as we cannot switch off our own specific palette. In contrast to this kind of close reading, this paper argues that computational methods allow us to retrieve, contrast, and compare historical color palettes from extensive collections of digitized images.

This paper studies color in two early-twentieth-century collections: 6,500 photochromes (1890-1910) and 65,000 autochromes (1909-1931).[1] In the late nineteenth and early twentieth century, railways and steamships increased global connectivity, placing new worlds within reach of an unprecedented number of people (Osterhammel, 2014). As people traveled between these worlds, they were exposed

[1] We collected 6,500 photochromes from the National Library of Congress, and the 65,000 autochromes from Albert Kahn *Archives de la Planète* dataset, hosted by the French *Hauts-de-Seine* department.

to different cultures and their specific color palettes. This exposure was mediated and amplified *in color* by new visual mass media. Color, as an element of a certain historical visuality, is thus not only determined by human observers and the world they have access to but also by the technical affordances of the color medium. Photochromes were produced by coloring a black and white photograph and using a chemical process to make six to fifteen lithostones. The same sheet of paper was printed with these stones and a corresponding number of ink colors: black, primary colors, and several additive colors. While humans selected the colors of photochromes, autochromes were made by letting light pass through a glass plate coated with a random mosaic of microscopic potato starch grains, dyed red-orange, green, and blue-violet.

We hypothesize that different technical affordances and different levels of human agency over color use shape specific historical color palettes. We test our hypothesis by analyzing color use in the representation of two worlds, the orient and the occident, in our two collections: photochromes and autochromes. Scholars of orientalism (Said, 1978) have argued that the occident imagined the orient, both literally and figuratively, as a ‘*colorful* world (our emphasis)’ (Oueijan, 2006). This paper examines this by analyzing color use in photochrome and autochrome images of Germany and Egypt, which we use as preliminary proxies for the occident and orient.

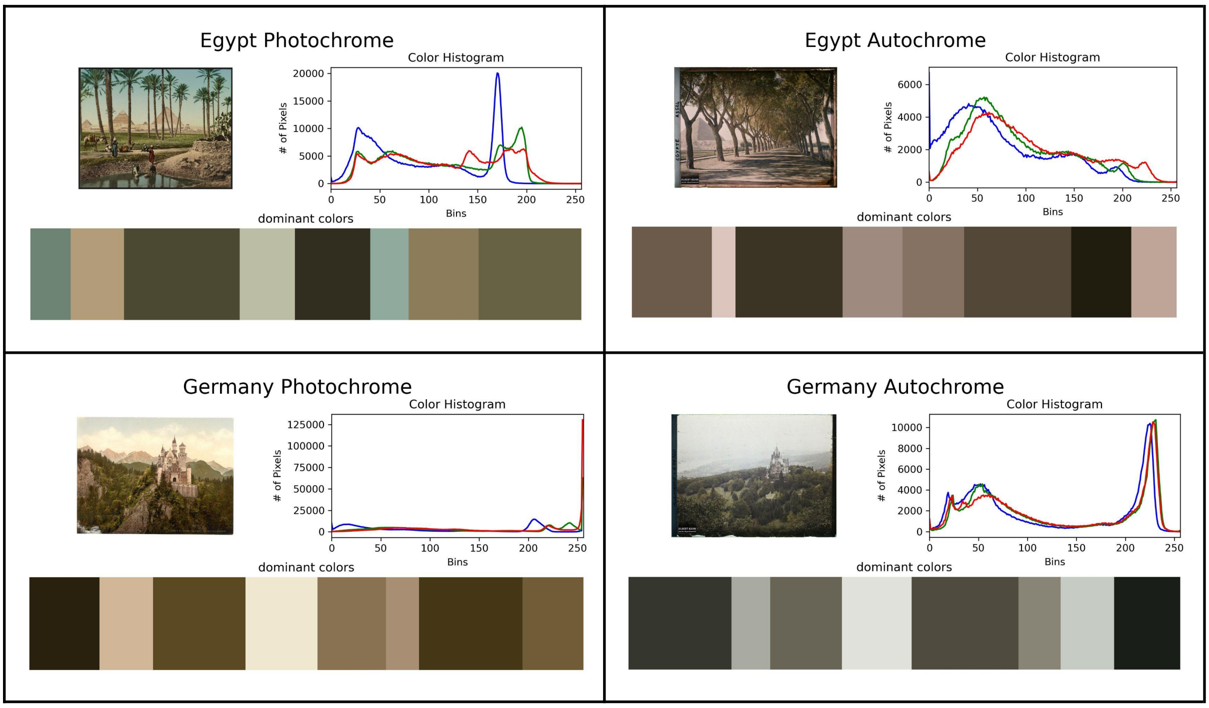

Figure 1: Dominant colors of two photochromes and two autochromes of Germany and Egypt.The color histogram shows the distribution or R(ed), G(reen), and B(lue) values in the image. The bar chart in the bottom shows the eight most dominant colors and their relative frequency in the image.

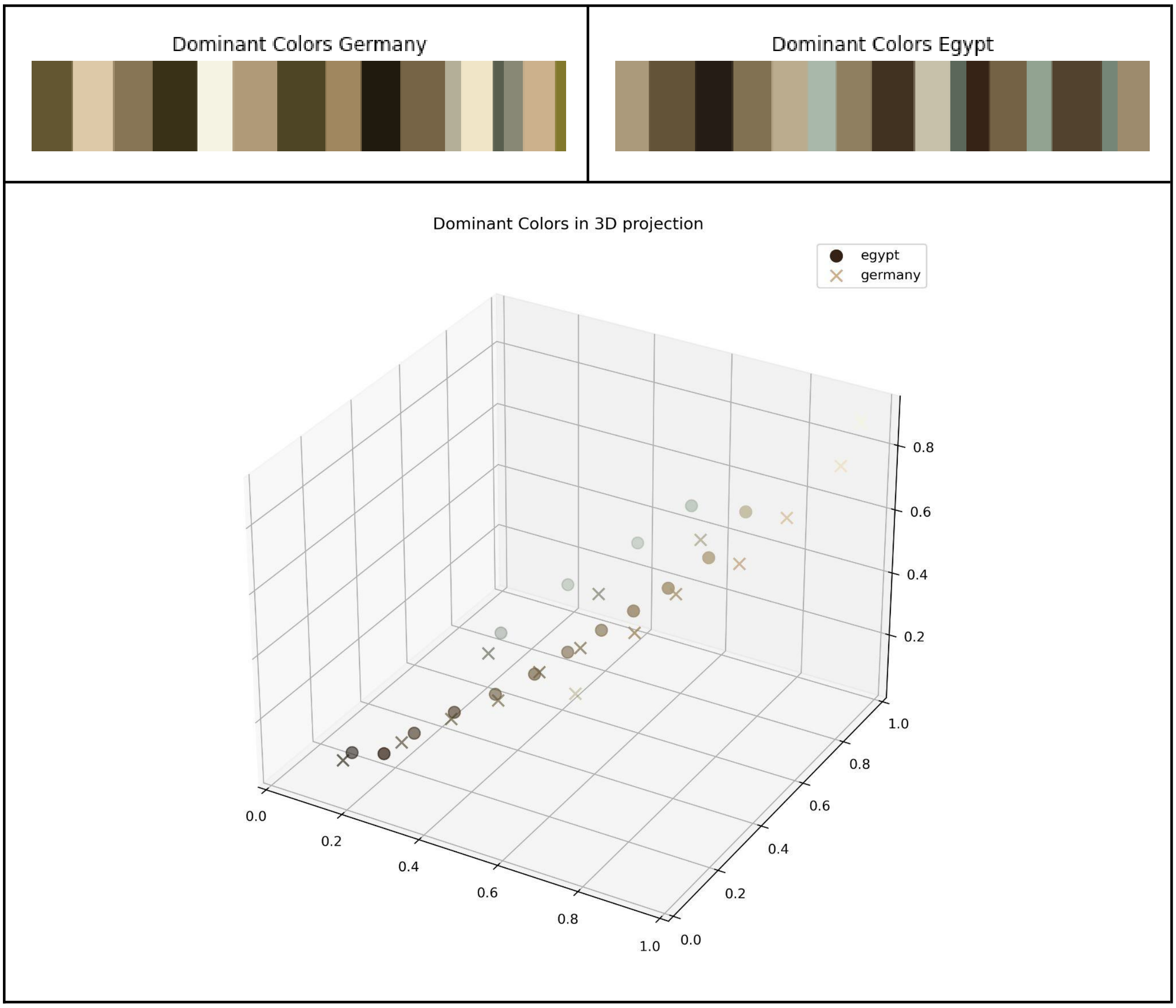

Figure 2: Dominant colors of Germany and Egypt in the photochrome collection. The barcharts show the 16 most dominant colors and their relative frequency in a random sample of 50 images of Germany or Egypt in the collection. The 3D-scatter plot displays these colors in a geometric space where the axes correspond to the RGB values.

Method

Following the work of Manovich (2012), who combined the extraction of 'numerical descriptions' of images with visualizations organized according to these features, scholars have used color as a way to analyze large visual collections. For example, Olesen et al. (2016) and Flueckiger (2017) applied computational methods to examine the use of color in early cinema. Following a project at the National Library of Congress (Wrubel, 2018/2021), we use k-means clustering to determine the dominant color swatches of each image in our datasets. Subsequently, we use these swatches to determine the dominant colors of Germany (occident) and Egypt (orient).[2] Concerning this last step, this paper only presents the results for the photochrome collection.[3]

Results

Figure 1 shows the difference in color use in two photochrome and two autochrome images of Egypt and Germany. Do these differences hold across the collections? Figure 2 shows the dominant colors for Egypt and Germany in the photochrome collection and a 3D projection of the colors. In both photochrome and autochrome, Germany and Egypt are less colorful than we expected. Different shades of brown and black dominate the images. This points out that vibrant colors (bright greens, blues, and reds) stand out against a background of less-noticeable colors. For example, we strongly associated green (thick forests) with Germany but Figure 2 shows that this color is only a relatively moderate dominant color (far-right of the swatch). While we did not associate Egypt with shades of blue/turquoise, their dominance seems to be the most pronounced difference between photochrome representations of Egypt and Germany. The prominence of skies and the water in the port of Cairo, for which the same color blue was used in photochrome printing, might explain this difference. All in all, the preliminary results show that computational color analysis enables us to compare different (sub)sets. In our presentation (and future work), we focus on these kinds of comparisons.

Next steps

In our final paper we will test whether our hypothesis holds by using clustering to validate whether the depicted world and/or technical affordances of photochrome and autochrome resulted in distinct color palettes. We expect that dominant colors are predictive for the medium (photochrome/autochrome) and the depicted world (orient/occident). Moreover, we will also examine whether there are diachronic and country-specific effects to be found. In future work, we plan to include more digitized collections, such as magic lantern slides and orientalist paintings. We also plan to use the dominant colors swatches to find numerically typical (in terms of color) visual representations of the orient and occident in these collections. By combining distant and close viewing, we hope to provide a robust and contextualized analysis of the representation of the orient and the occident, which might illuminate the extent to which these imaginations clashed in terms of color.

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[2] We select these images using metadata information provided by the collection. Moreover, we select fifty random images to account for unbalance in the number of images. There are 1,211 images of Germany and 107 of Egypt in the photochrome collection.

[3] We are currently preparing the collection of autochrome images.

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