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An Information System for the Analysis of Color Distributions in MovieBarcodes

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We present an ongoing project from the field of quantitative film studies, sometimes also referred to as *Cinemetrics* (Tsivian, 2009). Most of the related work in this area is focused on quantitative analyses of shot lengths and distributions[1]. In this paper, we suggest *color* as an additional quantitative parameter for movie analysis and describe an information system that allows scholars to search for movies via their specific color distribution. As a source of condensed movie color information, we make use of the *MovieBarcode*[2] database. A *MovieBarcode* is

[1] Cf. the extensive cinemetrics bibliography at http://cinemetrics.lv/articles.php (all URLs in this paper were last accessed on November 15, 2016).

[2] Available via http://moviebarcode.tumblr.com

created by skewing each frame of a movie to be only 1 pixel wide. Lining up all these frames in a row creates a barcode-like visualization of the most dominant colors in a movie (cf. Figure 1)[3]. Our information system makes use of the *color diff*[4] library to map more than 1,500 *MovieBarcodes* to a palette of 11 standard colors (cf. Welsch & Liebmann, 2006). In addition to these individual color profiles, we also collect metadata[5] (genre, year, director, country, etc.) and keywords from the movies' subtitles[6]. The tool can be used to search for movies based on their color distributions, or to identify general trends in the use of color in specific genres or periods of time, or in combination with certain keywords. Example questions that can be answered with our information system are:

1. What is the most frequent color in horror movies as compared to comedies?
2. How did the use of color in movies develop from the 1940s to the 1980s?
3. What are the most frequent words in movies that contain a lot of blue?

We are currently testing the system with scholars from the film studies area. In its current implementation, our system can be used as a "distant watching" tool (cf. Howanitz, 2015), i.e. it is used for the generation of new research questions or to test early hypotheses by investigating a large collection of movies from a quantitative perspective. As a next step, we want to extend the system to become a rich-prospect browser

[3] For a similar visualization approach cf. Barbieri et al. (2001).
[4] *Color diff* is an implementation of the CIEDE2000 color difference algorithm. Available via https://github.com/markusn/color-diff
[5] The meta information is available via http://www.imdb.com
[6] Subtitles are available via http://www.opensubtitles.org

(Ruecker et al., 2011), i.e. the tool will allow scholars to zoom into specific movies and to investigate them on more detailed levels of analysis, ranging from single frames to shots and scenes.

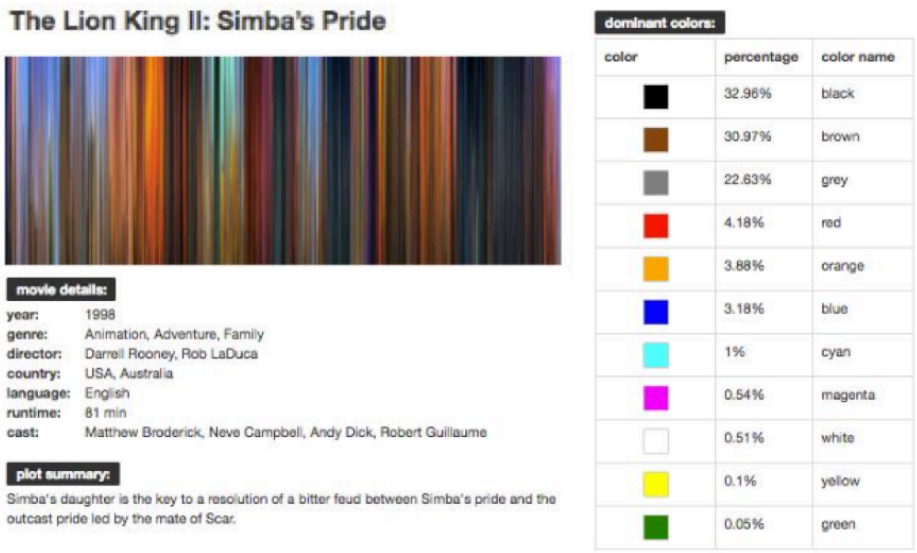

FIG 1: Example of a *MovieBarcode* and its specific color distribution.

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