The Role of Images in the Performance of Crowdfunding Projects

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ABSTRACT

With the popularity of crowd-funding, crowd-funding provides a more convenient way for people to realize their dreams and start their businesses. At the same time, there are a large number of projects on the crowd-funding platform but they are also mixed. This paper selects popular crowd-funding projects to study the relationship between the funding percentage of crowd-funding projects and the color features and texture features of pictures. And images of popular crowdfunding projects. This paper first uses Python and MATLAB codes to extract image features, and then uses R for relevant analysis. In the end, we found the general range of hue, saturation, brightness and image roughness, contrast, orientation, and line image of the popular item image colors.

Keywords: Crowdfunding, Image feature extraction, Hue, Brightness, Coarseness

1. INTRODUCTION

Crowdfunding platform originated in the United States. It began as a way to raise money for the artworks of struggle artists. With the development of society, crowdfunding has become a method that raises money to support startup projects. Crowdfunding has broken the traditional way of raising money. It makes it possible for more people to realize their dreams. However, the success of a crowdfunding project depends on many factors. Factors that determine success include the background, experience, subjective feelings of the project founder, pictures and videos of the project, and many other factors. This article will place the main research subjects on the pictures of the research project. As we all know, images include color, texture, character, space, and other features. Building on the research, color can influence the expectation of the productions, and color is the crucial clew in product packaging. What＇s more, colors are also crucial for their psychological implications. For example, Red, orange, yellow and other colors are called warm colors because they symbolize the sun and fire, which can cause people to feel warm. And blue, green-blue, violet, and other cool colors, such as blue sky ice, let people feel cold. In addition to the color, the texture of the picture can also affect human psychology. Because people's perception of texture features plays a crucial role in the recognition of the purchase object and the

understanding of the purchasing scene. According to research, psychological factors are one of the important factors affecting consumption.

This article will for the first time quantify the features of images with Python and MATLAB codes, and find the relationship between image features and the percentage of funding for popular crowdfunding projects from the perspective of data. Based on this, this article will by extracting image color features (hue, saturation, and brightness) and texture features of images (roughness, contrast, direction, like degrees), to study the Indiegogo platform in the popular items (i.e., the percentage of raising higher project) color and texture features of images and the percentage of the raise funds and the picture is tonal, saturation, The relationship between brightness, roughness, contrast, orientation, and line image.

2. LITERATURE REVIEW

Research published in 2016 found that information, media, and founders' subjective perceptions play an important role in the success of projects on crowdfunding platforms[1]. J Suresh Kumar published a study that revealed the importance of color in product marketing[2]. He studied the hue, saturation, chroma, and other properties of color, demonstrating the connection between color and emotion, as well as how color conveys information and the effect of color on

purchasing psychology. Charles Spence, Carlos Velasco found that color is the most important information in product packaging, and found that color has a significant impact on consumers' expectations and expectations of products[3]. Therefore, we can imagine whether the color of the image promoting the product on the crowdfunding platform will also have a certain impact on the expectation of the fundraiser for the product. In the 2019 study, we know that if the color of the product does not match the surface features of the product, the color will not play a good role. Rupa Rathee, Pallavi Rajain, Koch, Jascha-Alexander, Siering, and Michael studied the factors affecting the success of crowdfunding platform projects from the perspectives of project description, relevant pictures, relevant videos, and whether the founders had previously supported other projects[4-5]. Finding out whether a founder has previously supported other projects is not a factor in the success of a crowdfunding project. In the 2019 study, it was found that texture similarity is applied in material identification and texture recognition activities, which is a key technology for people to recognize objects and understand scenes.

3. METHODOLOGY

The image data comes from crowdfunding platforms, (Crowdfund Innovations & Support Entrepreneurs | Indiegogo). The number of data is 369 and the data is first-hand data. Using Octopus data collector to collect the image and Percentage of crowdfunding dollars data. HSV color space is made up of hue, saturation, and brightness of three-component composition, HSV is closer to people's subjective feeling, a color is tonal can basically determine, combining can judge the color saturation and brightness information threshold, so the python code can calculate accurate a picture is tonal, saturation and brightness. It can more accurately reflect people's subjective feelings. Tamura texture feature is a representation of texture feature based on human visual perception of texture and psychological research. The six components of the Tamura texture feature correspond to the six attributes of texture feature from the psychological perspective, namely roughness, contrast, orientation, line image, regularity, and roughness. In this paper, Tamura texture features of images will be calculated according to Matlab codes. Only the first four important components will be calculated in this paper. After collecting the pictures of the crowdfunding projects and the data, the picture will be processed by specific code of python to obtain hue, saturation, and brightness of the image and according to the specific code of Matlab to obtain the image, texture features such as roughness, contrast, directionality, linearity, regularity, and roughness. Multiple regression will be performed with the results and data of image processing by using R.

Thus there could be research questions: What is the relationship between the percentage of funds raised by popular crowdfunding projects on Indiegogo and the hue, saturation, brightness, roughness, contrast, orientation, and line image of the corresponding advertising images? What are the common characteristics of the images of popular crowdfunding projects?

Hypotheses: The percentage of the money raised by a popular Crowdfunding project on Indiegogo is related to the hue, saturation, brightness, roughness, contrast, orientation, and line image of the corresponding image.

4. DATA ANALYSIS

Images of hue, saturation, and brightness, according to the python code to handle can get images of roughness, contrast, direction and line like degrees can be based on the Matlab code processing, combining with octopus data collector to collect the corresponding percentage of the raising project was finished all of the data collection, data see appendix for details. Multiple linear regression analysis was conducted on the above data, in which financing percentage was the dependent variable, and hue, saturation, brightness, roughness, contrast, orientation, and linearity were the independent variables.(where y is Funding percentage, where x_1 is Hue, where x_2 is Saturability, where x_3 is Brightness, where x_4 is roughness, where x_5 is contrast, where x_6 is directionality, where x_7 is linearity)

The results of data analysis are as follows: $y = 0.272827 + 0.187432x_1 - 0.083675x_2 - 0.000633x_3 - 0.311263x_4 + 0.063871x_5 + 1.560002x_6 - 7.8348798x_7$

5. RESULT

The scatter diagram of the hue, saturation, brightness, roughness, contrast, and linearity image of the image versus the percentage of crowdfunding is shown belowAs the samples selected are popular crowdfunding projects on the Indiegogo platform, it can be concluded that images with hue values between 140-160, saturation values between 120-140, and brightness values between 75-125 are popular. Therefore, images with moderate chroma, saturation, and brightness are more acceptable. For texture features of images, images with roughness values between 4 and 8, contrast values between 40 and 50, directivity values between 2 and 3, and line images values near 0 are more popular. Among them, image color saturation, brightness, roughness, and line image have a negative effect on the funding percentage of the crowdfunding platform, while hue, contrast, and direction have a positive effect on the Crowdfunding project on the Indiegogo platform.
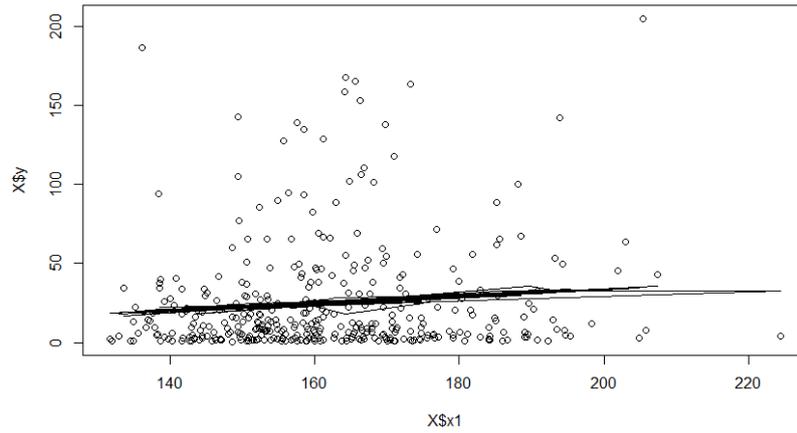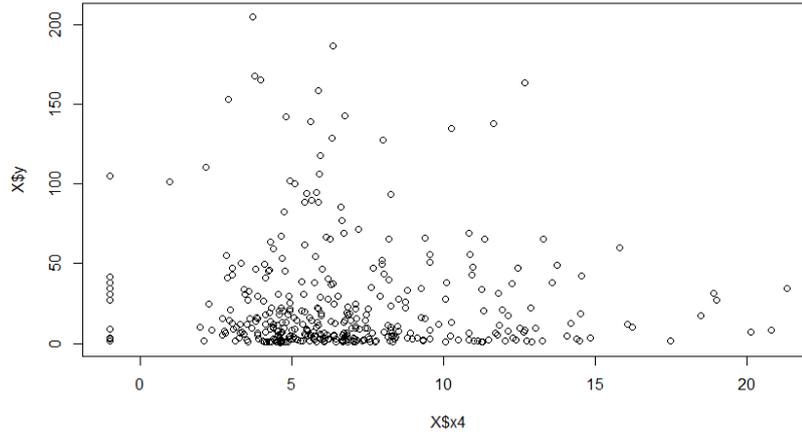
Figure 1: Scatter diagram of hues and percentage of crowdfunded projects, Y-axis represents the percentage of crowdfunded projects, X-axis represents hues. The tonal values for popular items are mainly in the 140-160 range.
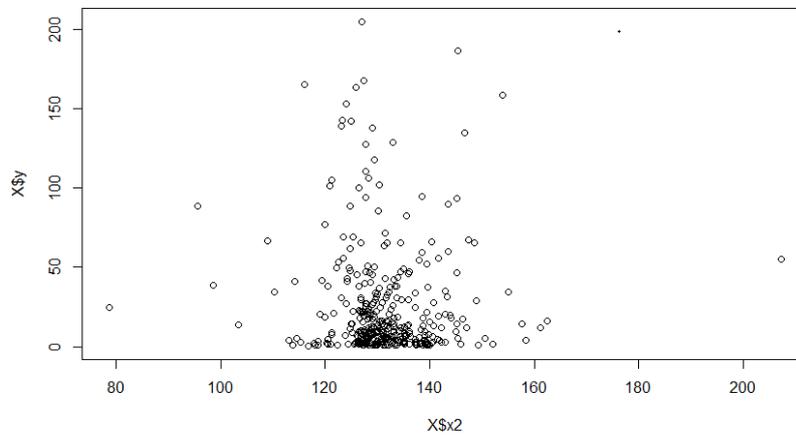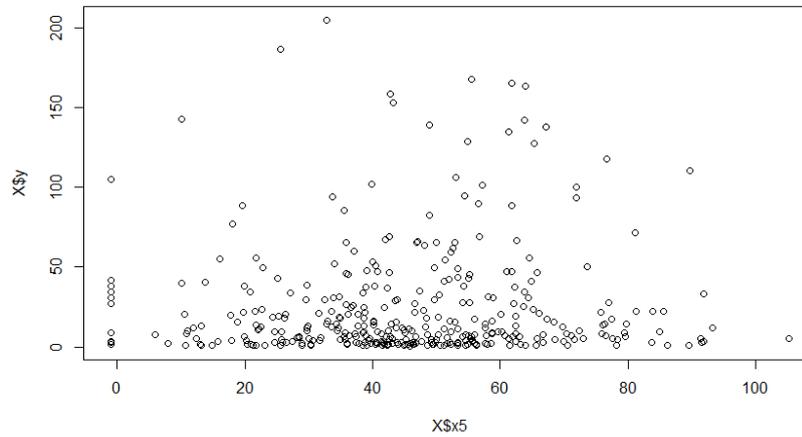

Figure 2: Scatter plot of saturation and percentage of crowdfunded projects, Y-axis represents the percentage of crowdfunded projects, X-axis represents saturation. Images representing popular items have saturation values between 120 and 140.
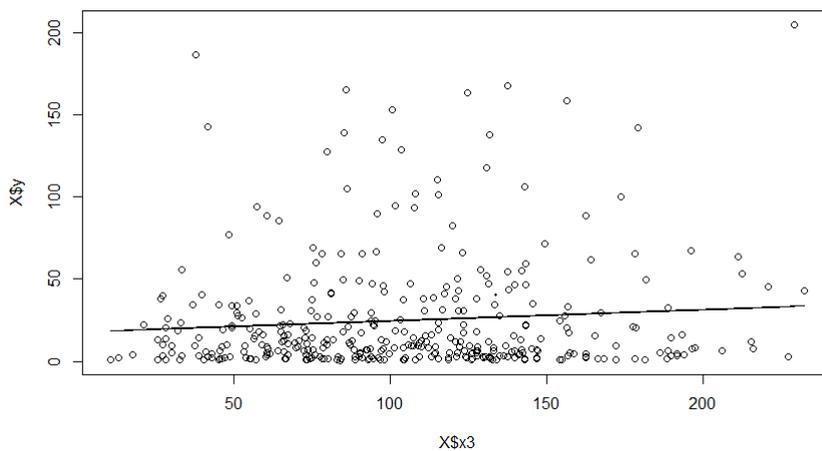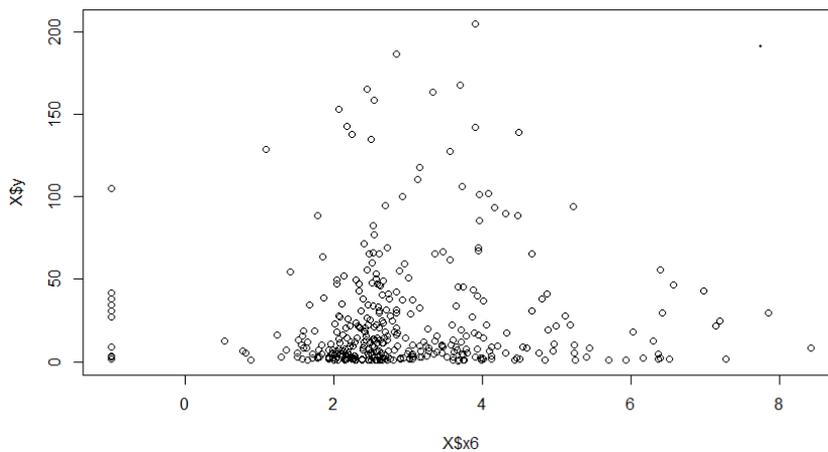

Figure 3: Scatter plot of brightness and percentage of crowdfunding projects, Y-axis represents the percentage of crowdfunding projects, X-axis represents brightness. Images representing popular items have a concentration of brightness values between 75 and 125.
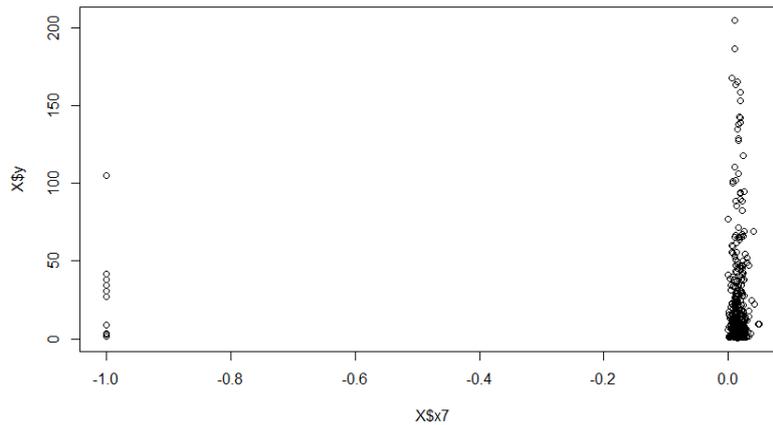
Figure 4: Scatter diagram of roughness and percentage of crowdfunded projects, Y-axis represents the percentage of crowdfunded projects, X-axis represents roughness. Images representing popular items have roughness values concentrated between 4 and 8.

Figure 5: Scatter plot of contrast and percentage of crowdfunded projects, Y-axis represents the percentage of crowdfunded projects, X-axis represents contrast. Images representing popular items have a concentration of contrast between 40 and 50.

Figure 6: Scatter diagram of the degree of direction and percentage of crowdfunding projects, Y-axis represents the percentage of crowdfunding projects, X-axis represents the degree of direction. The orientation values of images representing popular items are concentrated between 2 and 3.

Figure 7: Scatter diagram of line images and percentage of crowdfunding projects, Y-axis represents the percentage of crowdfunding projects, X-axis represents line images. The line resolution values of images representing popular items are concentrated near 0

6. CONCLUSION

This paper studies the color and texture features of the images of popular Crowdfunding projects in Indiegogo, and quantifies the specific values of the three components of color features such as hue, saturation, and brightness, as well as the specific numbers of the four components of texture features such as roughness, contrast, orientation, and line image. The specific scope of each component of images in popular crowdfunding projects is found, which provides a reference for the founders of future crowdfunding projects to take pictures and for fundraisers to judge the success of the project. On this basis, future researchers can expand the scope of research crowdfunding projects, not only limited to popular projects, but also completed projects, just published projects, projects to be completed, and so on. At the same time, other features of pictures can also be studied, such as location features and spatial features of pictures, so that crowdfunding projects can be more fully studied in relation to pictures.

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