Dominant Color Palette Extraction in Resumes using the New Color Pixel Quantifier Algorithm

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Dominant Color Palette Extraction in Resumes using the New Color Pixel Quantifier Algorithm

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Overview

- Introduction
- Review of Literature
- Research Contribution
- Methodology
- Evaluation
- Conclusion

Introduction

- A strong resume increases the chance of getting selected for best job opportunities.
- When it comes to getting the first impression of the recruiters, the design of the resume plays a vital role.
- Hence, when an individual is building their resume, they should focus not only on the content of the resume but also on the design such that it looks impressive and attractive
- When considering the design of a resume there are a few factors to be considered, such as originality, easily understandable format and layout, and last but not least color combination usage

Review of Literature

- Considering the currently implemented methods in some researches such as K-mean based extraction, Color feature-based extraction, color extraction by multidimensional particle swarm optimization and etc. for this purpose, they are not perfectly aligned and do not give the results as expected.
- They are more aligned with image color extraction which has thousands od millions of colors.
- Same time, despite having a limited number of colors in the resume above methods are not considered as much as efficient, since it takes a considerable amount of time to extract the color palette of the resume.

Research Contribution

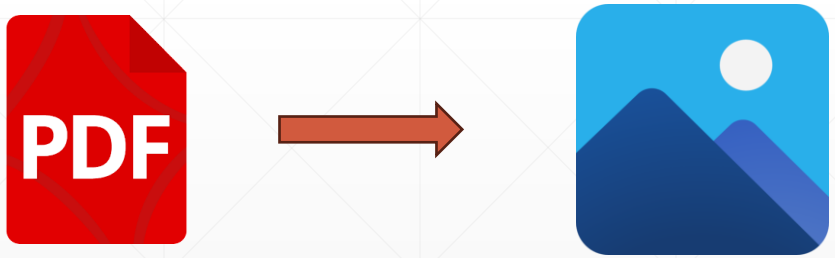
- Bridging this gap, in this paper, a new algorithm has been proposed for extracting the dominant color palettes in resumes, by using a color pixel quantifying mechanism.

- The findings not only offer immediate applicability in resume feedback systems but also open avenues for rethinking color extraction in various document types.

Methodology

Preprocessing

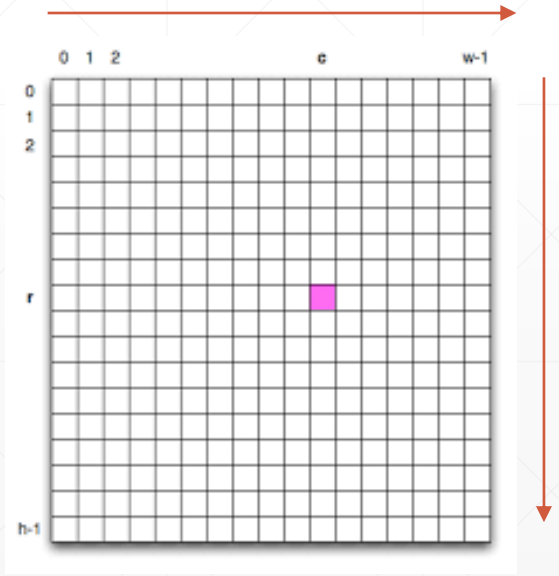
- First, the resumes in Portable Document Format (PDF) will be converted to an image format for the image manipulation tasks.
- After the conversion for further processing, the image of the resume was resized to a smaller size while keeping the color features of the image.



Methodology

Color Occurrence Quantization

- For color occurrence quantization, a very simple method of quantization has been employed, which is traversing through each pixel.
- Even though the time taken to traverse may be changed due to the size of the image, the resizing of the image preview of the resume, which has been done in the preprocessing step, ensured that it does not take much more time for the traverse.



Methodology

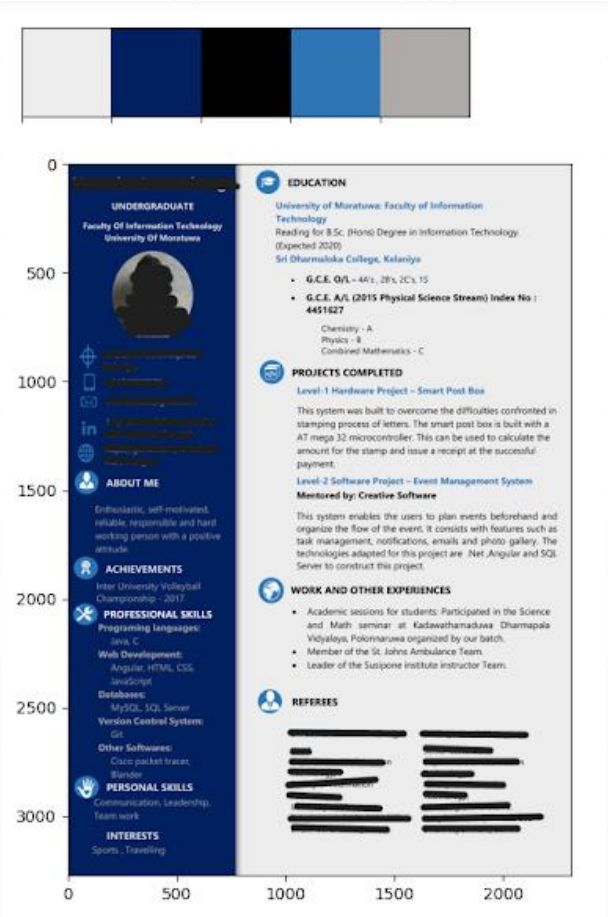
Similarity measurement

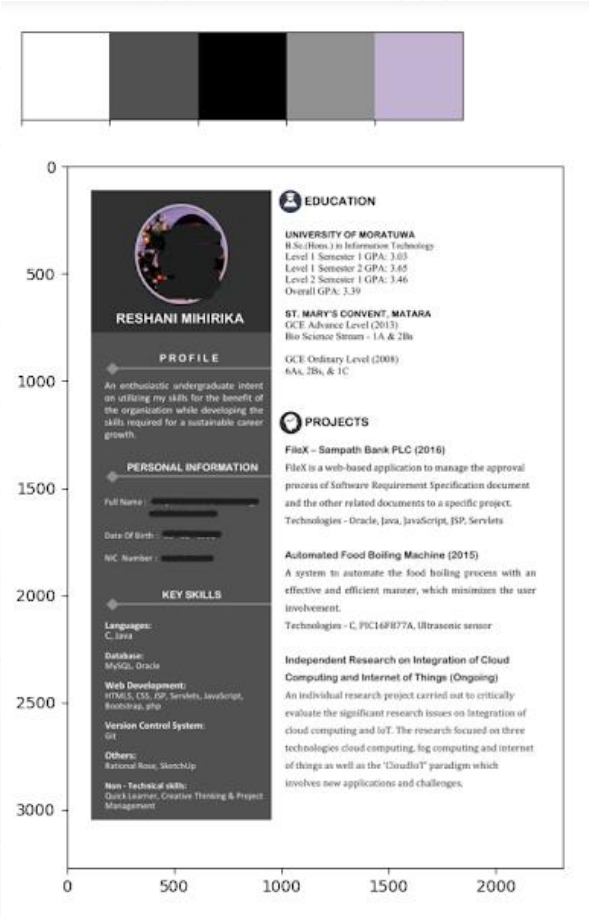
- Will be selected the best representation for the palette from out of all dominant colors.
- For the dissimilarity measurement, Euclidian distance has been used.

$$ED(C,D) = \sqrt{(R_C - R_D)^2 + (G_C - G_D)^2 + (B_C - B_D)^2}$$

- A smaller Euclidean distance implies a higher similarity between the colors, so those are discarded from taking as a distinct color for the palette.

Results of the Algorithm

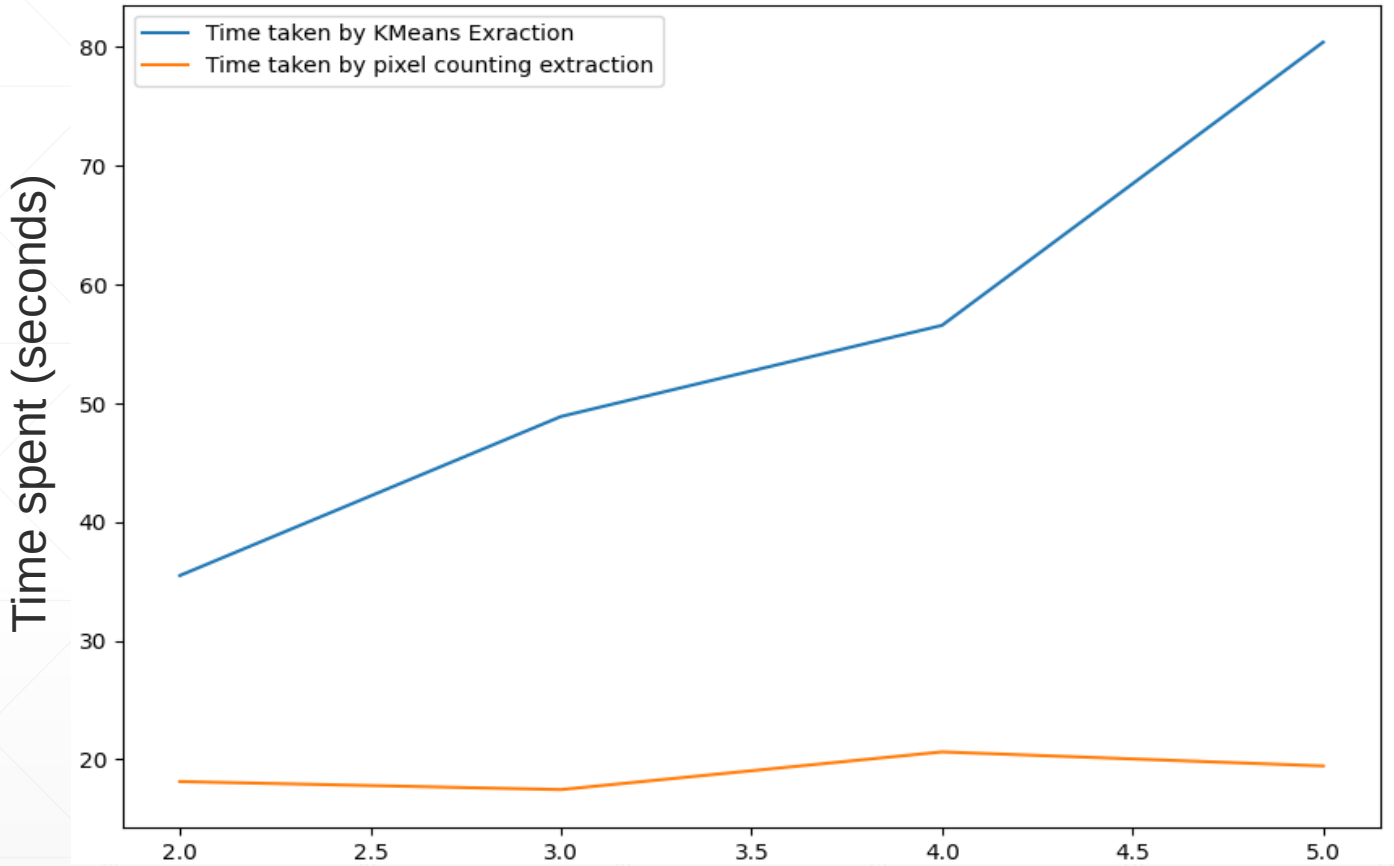




Evaluation

Objective Evaluation

- From ten unseen resumes, time taken to extract the dominant color pallet



Evaluation

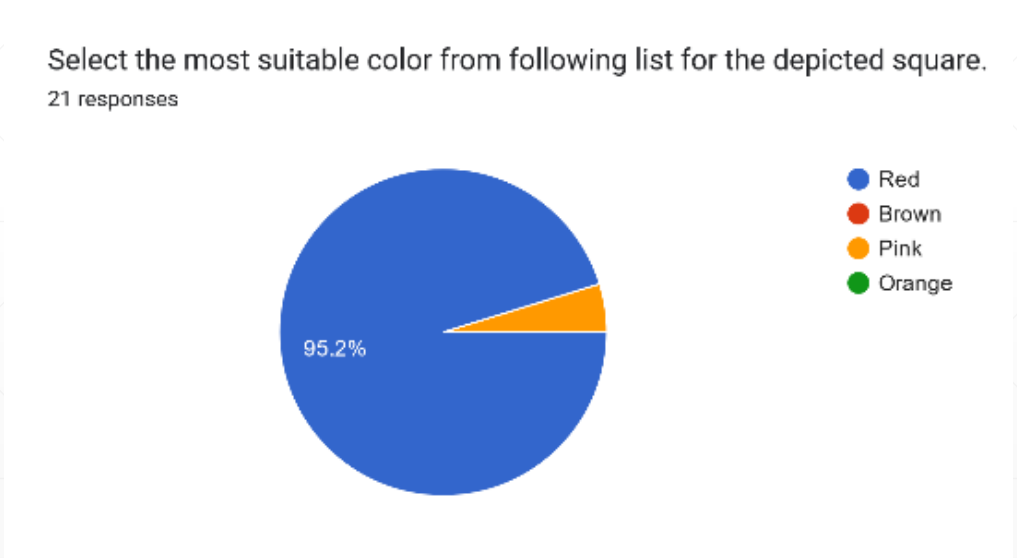
Subjective Evaluation

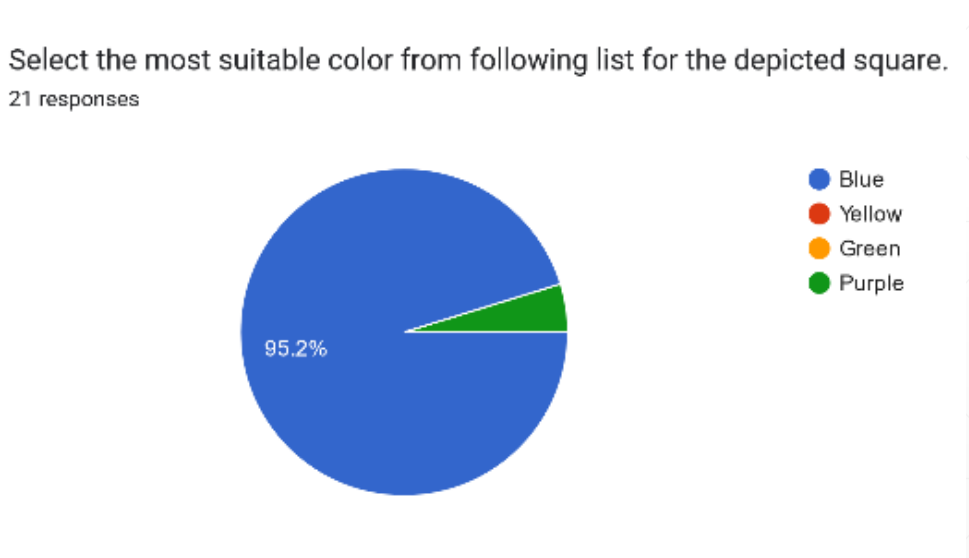
- As the subjective evaluation, twenty-one human subjects were utilized for rating the accuracy of the output which has been generated by the newly proposed method.
- This has been conducted through a survey using the same ten resumes used in the objective evaluation.
- A diverse pool of participants was selected through a purposive sampling method, ensuring representation across demographics and professional backgrounds.
- The selection process prioritized individuals with experience in recruitment, human subjects experienced in the color theory such as artists, and neutral human subject

Evaluation

Subjective Evaluation (Contd.)

- In the first half of the survey, subjects were tested for color blindness due to participants ability of accurate color perception preventing skewed or invalid results.

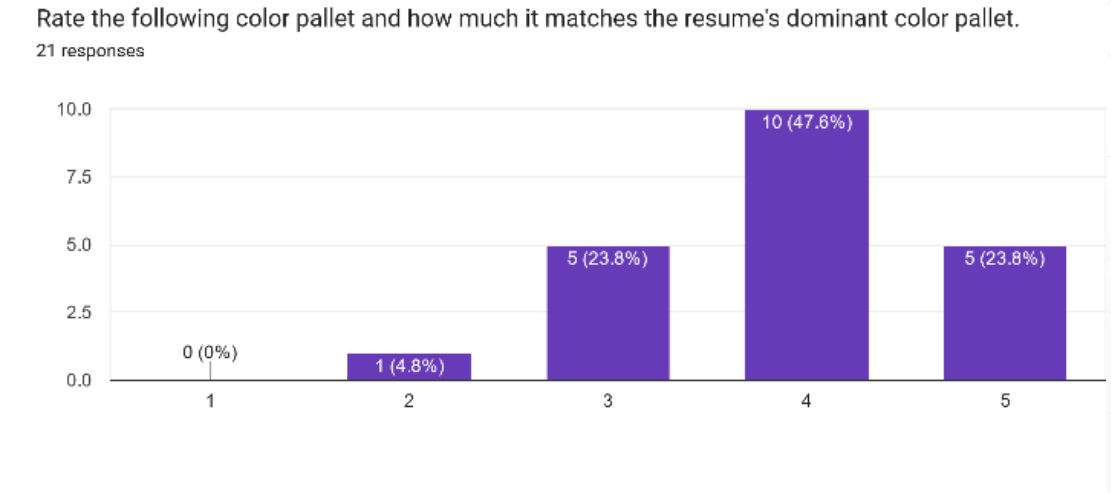


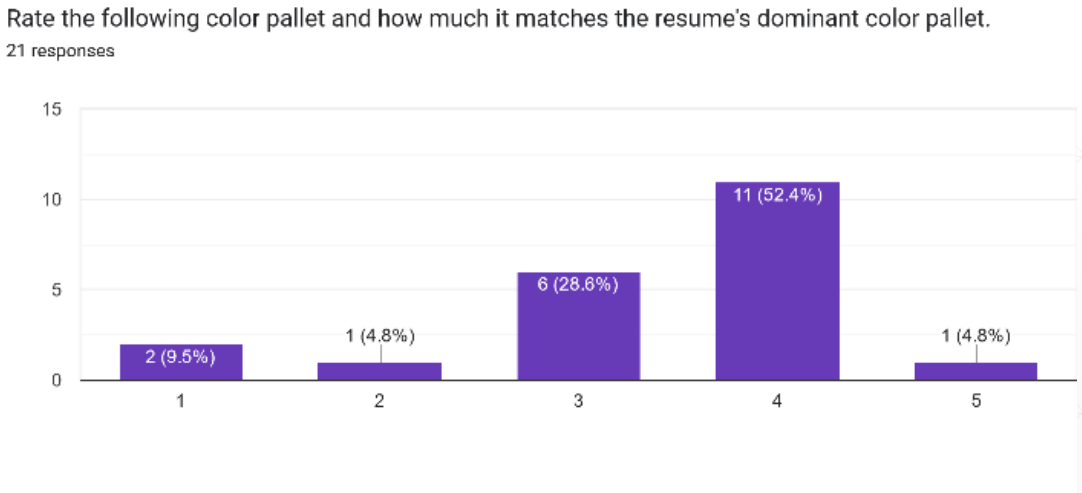


Evaluation

Subjective Evaluation (Contd.)

- In the second half of the survey, subjects were requested to rate the ten resumes one by one for how much the dominant color palette extracted by the proposed method matches the resume's dominant color palette, according to their preference and eyesight.





Evaluation

Subjective Evaluation (Contd.)

THE SUMMARY OF THE RATINGS WHICH HAS BEEN GIVEN BY THE TWENTY-ONE HUMAN SUBJECTS

Resume	Number of people who given the rating				
	1	2	3	4	5
Resume 01	0	3	4	11	3
Resume 02	0	5	2	11	3
Resume 03	9	7	4	1	0
Resume 04	0	3	2	11	5
Resume 05	0	1	7	11	2
Resume 06	0	1	5	10	5
Resume 07	2	1	6	11	1
Resume 08	0	2	5	9	5
Resume 09	1	1	9	6	4
Resume 10	1	1	5	8	6

THE ADJUSTED RESULT SET AND THE DERIVED STISTICS FOR EACH RATING

Resume	Number of people who given the rating					Average rating
	1	2	3	4	5	
Resume 01	0	2	4	11	3	**3.75**
Resume 02	0	5	2	10	3	**3.55**
Resume 03	9	6	4	1	0	1.85
Resume 04	0	3	2	10	5	**3.85**
Resume 05	0	1	6	11	2	**3.70**
Resume 06	0	1	5	9	5	**3.90**
Resume 07	2	1	5	11	1	3.40
Resume 08	0	2	4	9	5	**3.85**
Resume 09	1	1	8	6	4	**3.55**
Resume 10	1	1	5	8	5	**3.75**
	1.3	2.3	4.5	**8.6**	3.3	

Conclusion

- This paper addressed a significant challenge in the field of dominant color palette extraction for resumes.
- The currently implemented methods, despite their proficiency in handling images with an extensive color range, prove inefficient when applied to the context of resumes, which inherently employ a limited color palette.
- Our proposed method not only alleviates the time-consuming nature of existing techniques but also exhibits superior effectiveness when dealing with the distinctive color requirements of resumes.
- It is important to note that our research neither supports nor rejects existing methods; rather, it puts forth an alternative solution tailored specifically for resumes.

Thank You