Journal of Modern Technology and Engineering
Vol.9, No.3, 2024, pp.193-201
https://doi.org/10.62476/jmte93193

WAYS TO REDUCE THE LABOR INTENSITY OF WORK, SIMPLIFY THE DEVELOPMENT PROCESS AND IMPROVE THE QUALITY OF THE IMAGE WHEN DESIGNING A TYPOGRAPHIC PORTRAIT IN VECTOR AND RASTER GRAPHICS EDITORS

Varchenko Yurii

Ukrainian Institute of Arts and Sciences, Bucha city 08292, Ukraine

Abstract. The paper proposes new ways to reduce the labor intensity of work, simplify the development process and improve the quality of the image when designing a typographic portrait from a photo in the editors of raster graphics Adobe Photoshop and vector graphics Adobe Illustrator or Corel Draw. To reduce the labor intensity of work and simplify the process of developing a typographic portrait from a photo in a raster graphics editor, it is proposed to pre-process the photo in Adobe Photoshop with the "Pasteurization" command to select several color levels of the image, along the contours of which you can then draw lines that form a path for writing the letters from which the typographic portrait is formed. To simplify the process of developing a typographic portrait and improve the quality of the image in the vector graphics editors Adobe Illustrator or Corel Draw, it is suggested, after processing the photo in Adobe Photoshop with the "Pasteurize" command to select several levels of the image, upload the converted photo to the vector editor Adobe Illustrator/Corel Draw, and circle each color level with the "Pen" tool to form closed vector paths, which are then filled with letters, Having previously converted them into curves for the possibility of transformation along the inner boundaries of closed vector contours, at the same time, the letters that fill this or that contour are given the color of this contour.

Keywords: Development of a typographic portrait, labor intensity of work, simplification of the development process, improvement of image quality, raster and vector graphics.
AMS Subject Classification: 68D17, 65D17, 68U07.
Corresponding author: Yurii, Varchenko, Ukrainian Institute of Arts and Sciences, Bucha city 08292, Ukraine, Tel.: +380660817859, e-mail: *yu.varchenko@ugi.edu.ua*
Received: 17 August 2024; Revised: 18 October 2024; Accepted: 5 November 2024; Published: 25 December 2024.

1 Introduction

The profession of graphic designer is very interesting, prestigious, seems even romantic and is in great demand in the modern labor market. But at the same time, work on the creation of design projects requires a lot of labor, is characterized by work intensity and significant emotional stress, which ultimately affects productivity and quality of work and can become a source of occupational diseases. These consequences of professional hazards for a graphic designer are primarily associated with the use of computer technology, which is used to develop most projects, including text portraits or typographic posters (Shostachuk & Piddubna, 2023).

How to cite (APA): Varchenko, Y. (2024). Ways to reduce the labor intensity of work, simplify the development process and improve the quality of the image when designing a typographic portrait in vector and raster graphics editors. *Journal of Modern Technology and Engineering*, *9*(3), 193-201 https://doi.org/10.62476/jmte93193

With the modern development of computer equipment and software used to perform graphic work, the development of a text portrait or poster can be performed in various ways, which can be characterized by a large number of operations associated with the use of two or more editing programs, a significant number of software tools involved, the order of their application, etc. All these factors can increase or decrease the total labor intensity of work, which is currently established in Ukraine by the basic standard of labor intensity for development, for example, for a font poster it can range from 0.12-0.4 man-months (Svirko, 2020). That is, it can take from 4 to 12 days to complete one font poster, depending on the category of complexity. In addition, the imperfection of the method of developing a font portrait can complicate the work and worsen the quality of the final image, for example, due to the inability to convey small details of the portrait in the accepted way of applying fonts.

Unfortunately, in Ukraine, the problem of laboriousness of font poster development methods, their complexity and quality of execution has not been sufficiently studied. There is no theoretical basis for evaluating the effectiveness of methods for developing font posters in a particular graphic editor, and the methods themselves have almost no theoretical basis for their implementation. At the same time, there is a large amount of information and videos on the Internet, in which authors share only their skills in developing font portraits and posters in a particular program, or demonstrate ready-made works on stock sites pinterest.com, behance.net and other sites.

In our opinion, this situation is unacceptable and requires the development of a theoretical basis for designing or choosing an effective way to develop a font portrait in raster or vector graphics editors in order to reduce the labor intensity of work on the implementation of such a method, simplify the development process and improve the quality of the image. In this regard, based on our own experience and well-known theoretical and practical works of other authors, we offer two new ways to develop a font poster, which determines the relevance of this article "Ways to reduce the labor intensity of work, simplify the development process and improve the quality of the image when designing a typographic portrait in vector and raster graphics editor".

2 Materials and methods

The methodological basis of the study is based on the use of general scientific research methods: analysis, comparison, generalization of various ideas and proposals of domestic and foreign scientists on the problems of determining ways to reduce the labor intensity of work, simplify the development process and improve the quality of the image when designing a typographic portrait in vector and raster graphics editors.

Based on the method of analysis, a number of existing scientific works have been allocated in order to determine a positive domestic and foreign survey, which could become the basis for creating new ways of developing typographic posters and portraits in vector and raster graphics editors, standards and concepts of labor intensity for the development of font posters have been established (Svirko, 2020).

Based on the comparison method, the advantages and disadvantages of existing methods for developing a typographic portrait in the editor of raster graphics Adobe Photoshop (Shostachuk, 2023) and vector graphics Adobe Illustrator (Perhiniak, 2024) are highlighted.

With the help of the method of generalization of ideas and proposals of domestic and foreign scientists on the design of a typographic portrait, new ways to reduce the labor intensity of work, simplify the development process and improve the quality of the image when designing such a portrait from a photograph in vector and raster graphics editors are proposed.

3 Results and discussion

Literature review. In contemporary art, fonts are often used not only to convey information in the form of text, but also to draw images, that is, in this case, individual letters or words are used as artistic elements to create an image, such as a portrait, and may not perform their main function as text. The use of fonts to create images belongs to the branch of typography – the art of composing printed characters and printing. Portraits created from text are called typographic portraits, they are developed using fonts based on the selected photo. Therefore, such portraits have three main components: font, photography (Mavroudis J. 2024), and graphics (Shostachuk, 2023). When developing a typographic portrait, the author can work with each of these components using computer technology or manually. Based on the analysis of existing works, the following methods of creating typographic portraits can be distinguished:

1) by hand – with pen and ink or paints (Hand-painted typography portraits by Cris Wicks, 2017);

2) in a raster graphics editor (Sanchez, 2017; Zafar, 2023);

3) combined method – in raster and vector graphics editors (Perhiniak, 2024; Varchenko, 2024).

4) with the help of special computer programs that convert the letters of the English language into images (The Word Art of Juan Osborne, 2010).

In the first method of developing a typographic portrait (5 handmade portraits of famous characters using typography, 2016), contours are drawn on top of the photo, and text is written along these contours until the desired image is formed from it.

The disadvantages of this method of creating a typographic portrait are the inability to use multimedia technologies to create a portrait, significant time spent on manual work, the quality of the image depends on the personal skills of an individual.

The advantages include the absence of the need for pre-processing of the photo and additional operations in addition to applying text with a pen.

When implementing the second method, different options for applying letters are possible:

a – by drawing a text container with the "Text" tool over the entire canvas of the image and filling it with text, which is then rasterized, deformed and applied on top of the photo with a number of commands (Sanchez, 2017);

b - with the help of the "Pen" tool, create a line that will be the path for writing text with the "Pen" tool (Shostachuk, 2023).

The use of option a is limited to the ability to transform the text within the values of the text distortion command in Photoshop, this limits the author's intention. In addition, the ability to create portrait elements from individual words and letters is excluded, because the distorted text is superimposed on the photo all over the canvas at once. As an advantage of this option, one can note the ability to create a high-quality and realistic image and the low labor intensity of developing a typographic portrait.

When developing a typographic portrait according to option b (Shostachuk, 2023), the photo is loaded into the Adobe Photoshop raster graphics editor and processed with a Displace filter and a number of blending modes are added to achieve the portrait effect. The portrait effect is achieved as follows: after uploading a contrasting photo to Photoshop, it is converted to black and white, then using the Unsharp Mask and Outlined Edges filters (Poster Ages) reveals the main features of the portrait, the "Cutout" filter removes fine details and the "Channel Mix" command desaturates the image. After that, draw a line on the photo with the "Pen" tool, forming one of the contours of the portrait and then, along this contour, apply the font with the "Text" tool, which is enlarged or reduced in accordance with the elements of the portrait. The operations of drawing contour lines and text along these lines are repeated until a font portrait is formed.

The disadvantages of this method are its significant labor intensity due to the large number of operations, the need to create several working layers to create an image and the use of a large

number of filters and other tools, which complicates the work on a typographic portrait.

The advantages of the method include the fact that it has been widely used, because it allows the authors to express their idea to a greater extent with the previous version. In the third way to develop a typographic portrait, the photo is first also loaded into Adobe Photoshop and a silhouette version of it is created by desaturing, adding an adjustment layer "Levels" and painting over unnecessary elements with the "Brush" tool, then the resulting silhouette version of the photo is loaded into Adobe Illustrator and the desired letters or words are written on top with the "Text" tool, which are then distorted into the shape of one of the elements of the image using the "Distortion shells on the grid", if necessary, the text is corrected with the "Edit Content" command, the operations of writing the text, distorting it, and placing it along the elements of the photo are repeated until a text portrait is formed (Perhiniak, 2024).

The disadvantages of this method of creating a text portrait are also the high labor intensity of the image development process due to the large number of operations and the difficulty of fitting letters, and the words personally, to the elements of the photo after distorting the text elements with the command "Distortion of the shell on the grid", which can worsen the quality of the final image. The advantages of the third method are similar to the second method.

The implementation of the fourth method of creating a typographic portrait (Osborne J, 2024) requires special software and has not been widely used at this stage of development.

The analysis of well-known works has shown that when creating a typographic portrait from a photograph using computer graphics methods, there are three main operations that affect the labor intensity, complexity of work and image quality, these are:

1. Processing a photo to highlight the main contours of the image.

2. Applying additional contours to the image and converting the font to be able to transform it.

3. Direct transformation of the text on the image, in order to create the features of the portrait.

The purpose of the research is to develop effective ways to create a typographic portrait in raster and vector graphics editors, which will reduce the labor intensity of work, simplify the development process and improve the quality of the image when designing a typographic portrait.

The object of research is the processes of developing typographic portraits in raster and vector graphics editors.

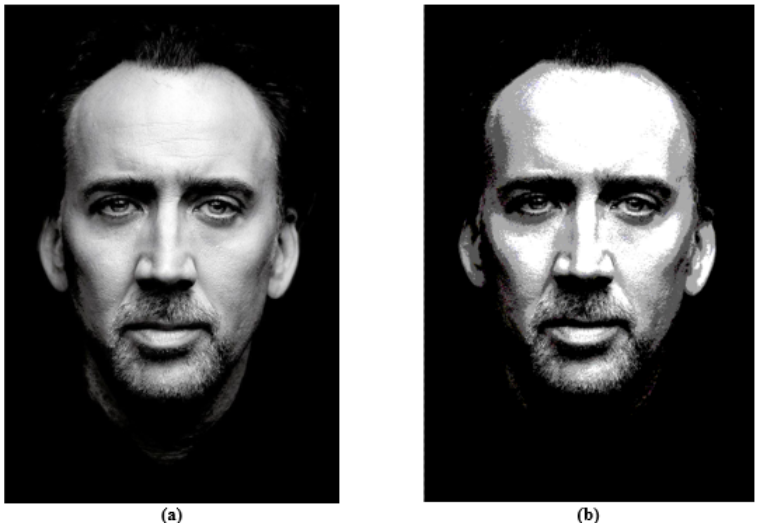
The subject of research is the methods and means of developing typographic portraits in the bitmap editor Adobe Photoshop and the vector editor Adobe Illustrator/Corel Draw.

A way to create a portrait from fonts from a photo in Adobe Photoshop.

To develop a new way to create a typographic portrait in the Adobe Photoshop raster graphics editor, let's take the method described in (Shostachuk, 2023) as a prototype. In this regard, the technical objective of the research in this subsection is to reduce the labor intensity of the process of creating a typographic portrait in Adobe Photoshop by reducing the use of the number of operations and tools. This task is achieved by the fact that in the proposed method of creating a typographic portrait, a photo with a portrait is first pasteurized in the Adobe Photoshop editor by the "Pasteurization" command to select several levels of image color, and then, along the lower contours of the color levels, lines are drawn that act as a path for writing letters that form a typographic portrait. To implement the method, select a contrasting photo (Figure 1, a); Nicolas Cage, 2024), load it into the Adobe Photoshop editor, and use the "Pasteurize" command to create 3-6 color levels (color spread, (Figure 1, b)).

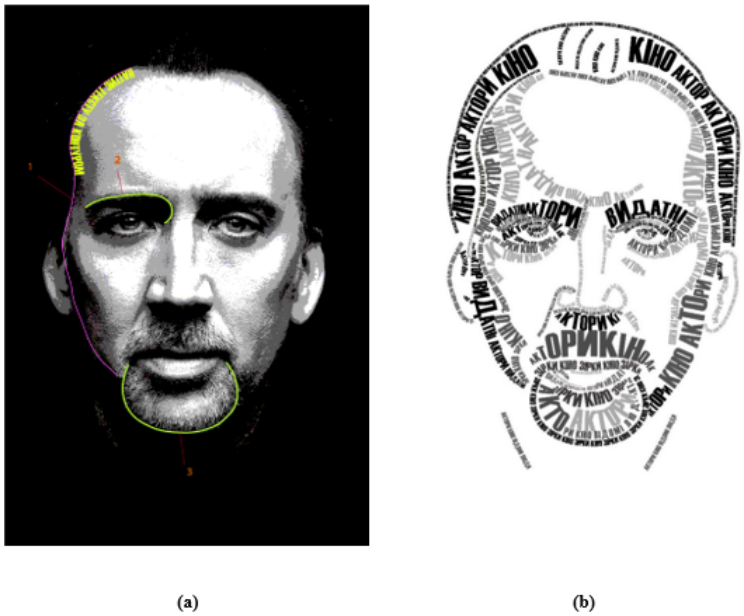
Then, with the Pen Tool, draw curved lines 1-3 one by one (Figure 2, a), which are arranged along the contours of pasteurization levels in accordance with the features of the portrait. These lines act as the path through which the Text tool draws text from letters, forming a typographic portrait (Figure 2, b).

Thus, the proposed method of creating a typographic portrait, in comparison with the



(a) (b)

Figure 1: Photo of the famous actor Nicolas Cage (2024): **(a)** To be processed in Adobe Photoshop; **(b)** After processing with the "Pasteurization" command.



(a) (b)

Figure 2: The sequence of developing a typographic portrait in the Adobe Illustrator vector graphics editor: **(a)** Drawing contour lines on the photo that form a path for writing text; **(b)** A typographic portrait developed in the manner proposed.

(a) (b)

Figure 3: Photo of the famous actor Eddie Murphy (2024): **(a)** Image of a portrait photo after processing in Adobe Photoshop with the Pasteurize command; **(b)** Drawing made along the colored contours of pasteurization with the Pen tool in the vector editor Adobe Illustrator.

method taken as a prototype, allows you to exclude the use of the filters "Unsharp Mask", "Outlined Edges", "Cutout" and the "Channel Mixing" command, as well as the need to create additional layers, which leads to a decrease in the labor intensity of the process of creating a typographic portrait.

A way to create a text portrait from a photo in the graphic editor Adobe Illustrator.

To design a new way to develop a typographic portrait in the Adobe Illustrator vector graphics editor, let's take the method described in (Perhiniak, 2024) as a prototype. Based on the above, the terms of reference of this subsection are to reduce the labor intensity of the process of creating a text portrait in the vector editor Adobe Illustrator, simplify this process and improve the quality of the final image by converting text into curves to transform letters in accordance with the contours of the photo.

This task is achieved by the fact that in the proposed method of creating a text portrait, the photo is first processed in Adobe Photoshop with the "Pasteurization" command to form several levels of color, then it is loaded into the vector editor Adobe Illustrator and each color level is outlined along the outer borders with the "Pen" tool to form closed vector paths, which are then filled with letters, after turning them into curves for the possibility of transformation along the inner the boundaries of closed vector paths, while the letters that fill this or that contour are given the color of this contour.

To implement the proposed method, select a contrasting photo (Eddie Murphy, 2024), upload it to the Adobe Photoshop editor and use the "Pasteurize" command to form 3-6 color levels (Figure 3, a). Then, the processed raster portrait is loaded into the vector editor of Adobe Illustrator and the Pen or Curvature tool traces the color levels of the bitmap image, creating closed vector paths that are filled with the appropriate colors, which allows you to create a vector portrait (Figure 3, b).

If there are large outlines in the vector portrait, for example, those that reflect hair, then they can be divided (at your discretion) by additional lines 1 (Figure 4, a) into a series of paths, which will allow you to fill such paths with smaller letters. After all the outlines are ready, select the desired font and use the "Text" tool to make an arbitrary desired inscription, for example, "Eddie Murphy" (Eddie Murphy, 2024), then the text is converted into curves, ungrouped and the resulting letters are moved to the previously formed contours of the image, placing them along the inner boundaries of the contours due to the transformation (Figure 4, a). After the

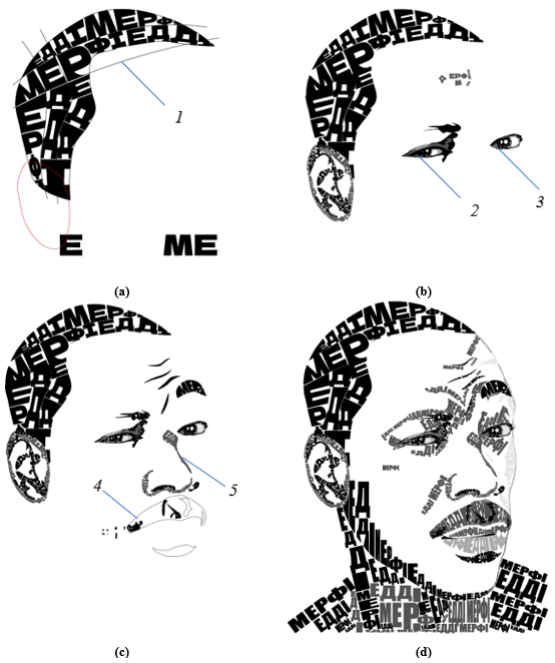


Figure 4: The sequence of developing a typographic portrait in the Adobe Illustrator vector graphics editor: **(a)** Add guide lines to a drawing to create additional vector paths; **(b, c)** Filling vector paths with letters by transforming them; **(d)** Text portrait made according to the proposed method.

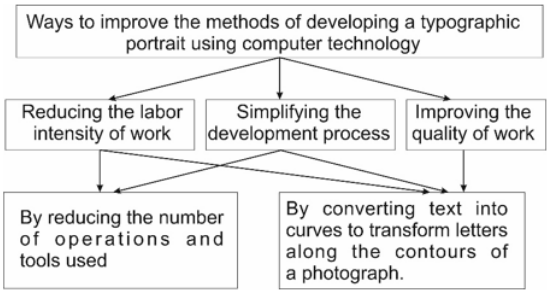


Figure 5: Ways to improve the methods of developing a typographic portrait using computer technology.

path is filled with letters, you can delete it and set the color of the selected path to the letters.

Next, they begin to fill the rest of the contours 2, 3 (Figure 4, b) and 4, 5 (Figure 4, c) with letters, and so on until a text portrait is formed (Figure 4, d).

Thus, the proposed method of creating a text portrait in comparison with the method taken as a prototype allows you to reduce the labor intensity of the process of creating an image in Adobe Illustrator, simplify this process and improve the quality of the final image by converting the text into curves, which allows you to accurately and quickly transform the letters in accordance with the contours of the photo.

In general, based on the results of the research, it is possible to draw up a scheme (Figure 5) finding ways to improve the methods of developing a typographic portrait.

4 Conclusion

The carried-out studies have shown that the main processes of developing a typographic portrait in raster and vector editors are: pre-processing of the photo to form clear color contours of the

portrait; selection and transformation of fonts to be able to adjust them to the contours of the portrait; Adjust transformed letters or words to the selected contours of the portrait. All these processes affect the labor intensity of the work, their complexity and the quality of the projected image.

A large number of tools, layers and commands used when processing a raster image of a portrait (photo) always complicates the design process, requires more processing time and makes it time-consuming.

The font used in the development of a visual image of a typographic portrait of a person should correspond to the nature of the composition as much as possible, for this it needs to be transformed. At the same time, the process of adjusting fonts to the contours of the portrait due to its transformation is the most time-consuming to work with. In this regard, the method of transforming fonts and fitting letters or words to the contours of the portrait affects the labor intensity of the work. In addition, the method of transforming the font can limit the boundaries of fitting letters, and personally words to the contours of the projected portrait, which will worsen its quality.

The quality of the created image is also affected by the way the contours of the portrait are filled with fonts. When filling the contours with text that is written along a given line, there is a problem with applying letters to small elements or in areas of changing the direction of writing the text due to the existence of sharp corners in the path of creating text. This affects the quality of the image. Taking into account all the identified prerequisites, which is the key to increasing the labor intensity of work, complicating the development process and reducing the quality of the image when designing a typographic portrait, new ways of creating it in the Adobe Photoshop raster graphics editor and Adobe Illustrator or Corel Draw vector graphics editors with pre-processing of the original photo in Adobe Photoshop were proposed.

The proposed methods of creating a typographic portrait were successfully implemented by the author in the educational process at the Ukrainian Institute of Arts and Sciences in the training of students in the discipline " Computer design" in the specialty 022 "Design" of the specialization "Graphic Design", which made it possible to improve the quality of training and improve the methodological support of the discipline.

References

Eddie Murphy (2024). https://www.pinterest.com/pin/351912465434497/ (accessed on 24.10.2024).

Hand-painted typography portraits by Cris Wicks (2017). https://ego-alterego.com/hand-painted-typography-portraits-cris-wicks/ (accessed on 24.10.2024).

Varchenko. Y (2024). URL:https://www.pinterest.com/pin/785244885061736482/ (accessed on 14.12.2024).

5 handmade portraits of famous characters using typography. (2016). URL:https://blog.artscase.com/en/art/5-handmade-portraits-famous-characters-using-typography/ (accessed on 14.12.2024).

Mavroudis, J. (2024). Typographic portraits. URL:https://www.zenpop.com/typographic-portraits (accessed on 14.12.2024).

Nicolas Cage (2024). URL:https://www.pinterest.com/pin/1477812371987304/ (accessed on 14.12.2024).

Osborne, J. (2024). A picture is worth a thousand words. https://juanosborne.com/ (accessed on 14.12.2024).

Perhiniak, M. (2024). Design a cool Typography Portrait in Adobe Illustrator. https://www.macprovideo.com/article/photoshop/design-a-cool-typography-portrait-in-adobe-illustrator (accessed on 14.12.2024).

Sanchez, D. (2024). Learn to Create a Text Portrait in Photoshop. https://medialoot.com/blog/learn-to-create-a-text-portrait-in-photoshop/ (accessed on 24.10.2024).

Shostachuk, T., Piddubna, O. (2023). Typographic portrait as a new type of visual image of postmodernism. *V International Scientific and Practical Conference Actual Problems of Modern Design, Kiev, KNUTD, 128-131.*

Shostachuk T.V. (2023). Organization of biomedical data for collaborative scientificArtistic Imagery of Postmodernism Graphics and Modeling of New Visual Images in Graphic Design. *Monograph. Zhytomyr, JDU Names I. Franko, 155.*

Svirko V.O. (2020). *Standardization in Design*: A Study Guide / V.O. Svirko, A.L. Rubtsov, O.V. Chemakina, O.V. Kuzmin. *General. Ed. V.O. Svirka. –Kherson: OLDI-PLUS, 232.*

The Word Art of Juan Osborne. (2010). URL:https://www.webdesignerdepot.com/2010/11/the-word-art-of-juan-osborne/ (accessed on 14.12.2024).

Zafar, M. (2023). How to Create a Stunning Typography Portrait in Photoshop. https://www.lightroompresets.com/blogs/pretty-presets-blog/how-to-create-typography-portrait-photoshop (accessed on 14.12.2024).