An Introduction to Expressionism Analysis Based on Meaningful Deformation

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Author's contribution

The sole author designed, analyzed and interpreted and prepared the manuscript.

Original Research Article

ABSTRACT

In this paper, we present an application of meaningful contours in visual arts. Here, after defining the meaningful circular and polygonal contour and presenting functional definitions of meaningful contour based on fuzzy thinking, we examine the grounds for deformation in the style of Expressionism, and provide a method for its understanding and learning. This view can help the method for criticizing the works of Expressionism as well as the educational methods of this style from a different perspective. It is definitely important to us that the proposed methods can maintain the individuality and individual independence of the person in the creation of the artwork based on a meaningful geometry, without involving the audience in educational stereotypes. Given the wide scope of the discussion of this style, our work is definitely describing the theoretical preliminaries in the area of fuzzy thinking and deformation, and we will provide the extensive analysis of the outstanding works of this style in the future papers and other definitions. But at the end of this paper, we will have some examples of deformation in the history of art.

Keywords: Meaningful contour; deformation; expressionism; meaningful point; meaningful line.

1. INTRODUCTION

In the history of art of expressionism, a commonly used expression in visual arts is the exploitation of exaggeration to express and visualize the artist's inner emotions. This expression, in its broad and universal implication, can be applied to any type of artistic creation that

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emphasizes the inner and subjective impressions rather than objective and exterior observation. The pictures of some of the sixteenth-century artists such as Grünewald and El Greco, who convey extreme religious emotions through non-representational forms, have been referred to as outstanding examples of expressionism. (Expressionism, with this general concept, is written with e in English and French). The term Expressionism (with E), in its special sense, refers to a broad trend in modern European art, the background of which goes back to Vincent Van Gogh, a painting that used color and line in an emotional way in order to display the horrible passions of man. James Ensor (Belgian painter) and Edvard Munch (Norwegian painter) are among the great artists representing this kind of Expressionism. Between 1905 and 1930, Expressionism was the dominant artistic movement in Germany, and its leadership was associated with the groups of Brücke and Der Blaue Reiter. From that date on, Abstract Expressionism was another expression that made an evolution in this school [1,2].This expression that became common in 1950, describes the movement in the visual abstract art, which emerged in New York in the 1940s. Expressionism was first used for some of Kandinsky's early works, but it became common when it referred to the works of Arshile Gorky and Jackson Pollock. Shortly afterwards, it was expanded to the other New York painters' works which were neither abstract (such as the works of de Kooning and Gottlieb) nor expressionist (such as the works of Rothko and Klein). The painters described by this expression, have similar attitude and perspective rather than a common style: Everybody wants to flutter against the constraints of traditional styles, and violate the technical techniques. They want to violate the technical techniques and abandon the art criterion completed according to the ancient aesthetic criteria and introduce it meaningless; they have an aggressive spirit and call for freedom and spontaneity expression. The most striking example of this spontaneity is the active painting of Jackson Pollock. This movement is linked to Tachisme and has greatly affected the European painters of the 1950s and 1960s. It was the first time that an American movement could have been in such a situation and made New York as the successor to Paris as the world's leading art center. Considering the historical background and the importance of these styles in contemporary art, we focus on the bases of deformation of Expressionism based on a meaningful geometry. There are a lot of

researches in image processing and methods of analysis of deformation in image with aspect of computer engineering and with algorithmic point of view (like [3]), that we avoid of them here. Our goal is the presentation of fuzzy thinking and fuzzy geometry (simple and functional) as an approach to helping the art, like the works in fuzzy geometry that come in [4-6].we try to present our geometric method with minimum complexity for artists.

We provided definitions of the point, line, and meaningful surfaces in visual arts in previous papers [7,8]. Now, in this paper, as a practical application of these data, we begin with an analysis of some works by the artists of the style of Expressionism. In this regard, after introducing definitions for meaningful circular and polygonal contour and presenting functional definitions of meaningful contour based on fuzzy thinking, we present an educational-analytical method for understanding the creative deformation in Expression. This method is supported by meaningful geometry on the one hand and, it completely preserves the individual independence of the audience (art learner) in thinking on the other hand, and does not cause stereotyping in the education path. Here are some examples of the results that have been obtained from the presentation of this method to the learners at the art studio[1]. At the end of each workshop, a questionnaire was provided to the audience to make sure that this method did not limit their understanding and practice in an artistic and creative process. It was also important for us that the method had the simplicity of understanding and the least complexity in the implementation. Obviously, in today's world, due to the high speed of science production, the teaching methods and the optimal transfer of scientific materials are also of particular importance. We also gave some examples of deformation in the works of some artists in order to highlight the importance of methodology in the analysis of the work. However, this article, like previous papers, focuses on the expression of basic concepts and definitions, and leaves the analysis and critique for the future works. Here it should be noted that we have come to the conclusion that we must use the expression "meaningful" instead of "membership" in the fuzzy discussions in these papers, because we are looking for words that are closer to the artistic use and are more

familiar and tangible for the active minds of the artist, in order to create the initial point of contact between art and fuzzy mathematics with the most accuracy possible, but the most delicate form, and pave the way to continue this path.

2. MEANINGFUL CIRCULAR AND POLYGONAL CONTOURS

Here, based on what we have in [9,10], we provide definitions for meaningful circle and meaningful polygon. These definitions are a subset of our functional definitions of meaningful contours, so we refer to them in this paper as meaningful circular and polygonal contours. It is necessary to emphasize once more that our insistence on using the expression "meaningful" instead of the general expression "membership" in fuzzy theory is due to the fact that "membership" is a general term for all applications of fuzzy mathematics that takes a special meaning in each branch of science in accordance with its applications. Therefore, we also use the more tangible term of "meaningful" (for the artist reader) with regard to their applications in visual arts in order to provide the necessary background for better understanding and making fuzzy geometry closer to visual arts as much as possible.

Definition 1.1: Let $\tilde{A}, \tilde{B}, \tilde{C}$ be three arbitrary numbers (whose meaningful functions are defined by the artist) and for $0 \leq \alpha \leq 1$, Let

$$\Omega(\alpha) = \{(x,y) : (x-a)^2 + (y-b)^2 = c^2,$$
$$a \in \tilde{A}(\alpha), b \in \tilde{B}(\alpha), c \in \tilde{C}(\alpha)\} \qquad (1)$$

In this case, a meaningful circle, $\tilde{\zeta}$, is defined by its meaningful function

$$\mu((x,y)|\tilde{\zeta}) = \sup\{\alpha : (x,y) \in \Omega(\alpha)\}. \qquad (2)$$

Definition 1.2: Let $\tilde{L}_1, ..., \tilde{L}_n$ be meaningful line segments from meaningful points of $\tilde{P}_1$ to $\tilde{P}_2, ..., \tilde{P}_n$ to $\tilde{P}_1$, respectively. Then a (regular) n-sided meaningful polygon $\widetilde{P}$ is

$$\widetilde{P} = \bigcup_{i=1}^{n} \widetilde{L}_i \qquad (3)$$

The meaningful function for $\widetilde{P}$ is

$$\mu((x,y)|\widetilde{P}) = \max_{1 \leq i \leq n}\{\mu((x,y)|\widetilde{L}_i)\}. \qquad (4)$$

Note: We present in definitions 1.3 and 1.4 some simple but functional definitions of meaningful contour in the area of visual arts; definitions that are based on fuzzy thinking and understandable to the artist as far as possible, without seriously jeopardizing his mathematical expression. In the following parts, meaningful polygon definition can be used for meaningful contour or its simple and functional form as follows:

Definition 1.3: Meaningful contour is a set of meaningful points forming the outer edges of the positive space on a meaningful surface (or outer edges of phenomena that is artist's subject).

Definition 1.4: Meaningful contour is a meaningful line passing through the outer edges of the subject of artwork.

3. MEANINGFUL DEFORMATION

It is not possible to consider contemporary art without the proper perception of modern art. Also, the diversity of the 20th-century artistic styles and the individualism wave of this historical period of art have created complexities for areas such as critique and education of art. In recent times, it has become necessary to present simple but precise methods, which provide him with a deeper understanding of artistic styles without entangling the minds of the learners in common stereotypes; methods that can give a deep understanding to the audience while maintaining his intellectual independence in the perception of his surroundings and the creation of his work of art. Following the main objectives of these papers that seek presenting integrated and individual tools for analysis of artworks, here, as an application of meaningful contours, we provide methods for deformation in visual arts. These methods lead to the creation of a deformed artwork that expresses his feelings without preventing his thoughts and individual feelings of the audience in creating the work. In a training course in the workshop, we asked our learners to create an artwork that expresses their emotions and thoughts in the form of digital art.

Method 1:

Step 1: Determining a personal meaningful function
Step 2: Drawing a meaningful contour around the model image (fuzzification step)
Step 3: Selecting the lines, that represent the individual's sense, from the set of lines

that pass through the meaningful contour, and determining the crisp contour (defuzzification step)

Step 4: Developing or limiting the model to the crisp contour.

Method 2:

Step 1: Determining a personal meaningful function

Step 2: Drawing the crisp contour around the model

Step 3: Drawing arbitrary number of meaningful points (according to the function of step 1) on the crisp contour

Step 4: Drawing a meaningful contour passing through the points in step 3

Step 5: Determining the crisp lines from the inside of the meaningful contour (defuzzification step)

Step 6: Developing or limiting the model to the definite contour of step 5.

Note: We will return to such methods in the future in the analysis of other painting styles, including Cubism.

At the end of this section, we present some examples of the implementation of the above methods by the learners. It should be noted that at the end of the study, using the questionnaire, the author assured that the above methods, while expressing the concepts of deformation and expressionism, have not constrained or stereotyped the learners in expressing their feelings and thoughts[2].

Example 2.1: In this example, we implemented the first method on a pot as a model (Fig. 1). Using the personal meaningful function, the

learner has drawn a meaningful contour presented in Fig2. After defuzzification step and the development or limitation of the model to the crisp contour, Fig. 3 has been obtained as a deformed and expressive work.
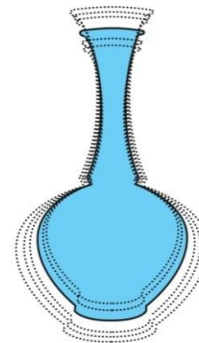

Fig. 1. Model for deformation method

Fig. 2. Fuzzification step of method 1 of Fig. 1

Fig. 3. Deformed form of Fig. 1, by Learner (Ali Khaleghi)

Example 2.2: Here, the learner performed the work on the image of the pot using the second method. As can be seen in Fig. 4, his desired

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2. Note: It should be noted that, as in the previous articles in this field, we have to put the basis for this article on the geometric definitions; we have tried in the first steps to focus the reader's attention more on the structures and the meaningful geometric links and supportive mathematics. We have refused to provide analyses and results of empirical methods and left them for other independent papers. Because it was very important for us to initially make a proper link between two branches of science (arts and fuzzy logic) and, after fully expressing the definitions and fundamental concepts, go to analytical papers and field studies. Here, we will only briefly mention that the participants have been only mastered in the Photoshop software and attended a one-month course (with a two-hour session per week) to get familiar with the basics required in my previous articles and to understand the fuzzy thinking. In my first trial, I deliberately selected the test subjects something other than the arts and fuzzy thinking in order to study their educational development compared to academic students of the arts.

meaningful points are drawn on the image (Definition of the point is the one that we described in the first paper of this series and we briefly illustrated it here); and in Fig. 5, the line passing through the meaningful points are specified. This line is also selected by the learner from inside the meaningful contour passing through these points. At the end, with the development and limitation of the model, the deformed Fig. 6 has been achieved.
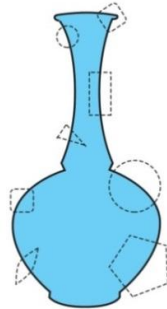

Fig. 4. Meaningful points for Fuzzification step of method 2 of Fig. 1
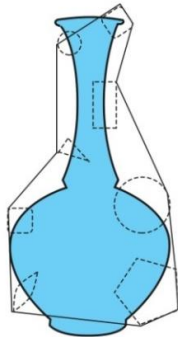
Fig. 5. Defuzzification step of method 2

Fig. 6. Learner's deformed image of Fig. 1 by method 2

Example 2.3: In another example, we chose the model as a portrait of the author's artwork (Fig.

7). After implementing the second method on this model, the learner has finally presented the deformed portrait of Fig. 8, which is a diagram of his inner thoughts and feelings.

Fig. 7. Author's painting for digital art model

Fig. 8. Deformed portrait by method 2

4. SAMPLES AND MODELING

Here we go a little back in order to provide the necessary preliminaries for entering the discussion of Expressionism analysis; we start with two artists whose works have early traces of deformation and are suitable for our discussion at this point. On October 22, 1906, the greatest genius of the art of painting in the twentieth century, whose artistic discoveries have influenced the majority of the art of the last century and has been named as "The Man of the Century", passed away. The name of this man was Paul Cézanne. The transformation that Cezanne created in the art of painting is on par with the revolution that Giotto began in the thirteenth century. The influence of his art in the advent of our century's artistic transformations is in line with the impact that Michelangelo's art had on the world's painting and sculpture for four

centuries. Among Cezanne's influential works in painting art was the establishment of the interior space and structure arrangement of the picture. The composition of the visual elements in Cezanne's paintings is based on the artistic forms and all-round mobility of the elements. Each object is placed on the canvas of Cezanne, due to a particular reason, and to create a balance with other objects and in relation with the integrity of the work.

In Fig. 9, we provided a famous work from Paul Cezanne. In this work, he has deformed the objects to maintain the structure and achieve his desired composition. We have separated an object in this work and have shown it separately in Fig. 10. In this figure, we have plotted the meaningful contour with yellow line and have shown how the artist imposed his thinking on the subject of painting. The black line is the original form of the fruit bowl before deforming.
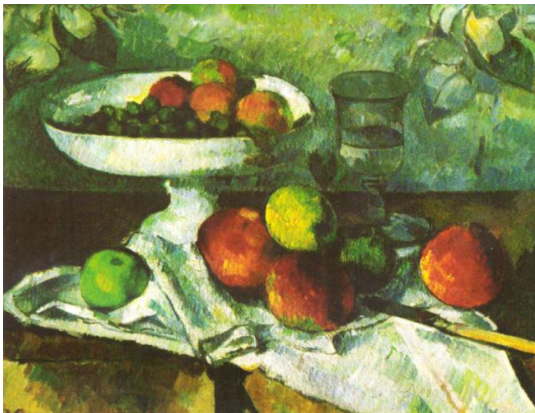

Fig. 9. An artwork by Paul Cezanne

Fig. 10. Meaningful contour for fruit bowl before deforming it

After Cezanne, self-taught paintings by Francis Bacon absorb our attention. Deformation in the

paintings of this painter, brings fear and praise to the art lover at once. Figs. 11-13 are examples of his outstanding work, in which deformation is the obvious point [11]. However, the content and form duality in his work made Bacon critics to consider him as Surrealist rather than Expressionist, but for us, it is an appropriate case for analyzing deformation in both styles.

Fig. 11. John Dicken's photo of Isabel Thorne

Fig. 12. The image of Francis Bacon

Fig. 13. John Dicken's picture of George Dyer

In Figs. 14-16, we have provided three works of bacon, and we mentioned their names under

each figure. They have been chosen since there is a picture of the model that the painter has been influenced by, and we have provided them in Figs. 11-13, respectively. For example, we have presented the mental contours that can be created in the mind of the audience, in Figs. 17-19, respectively. These meaningful contours indicate the severity of Bacon's mental-behavioral patterns and deformation.
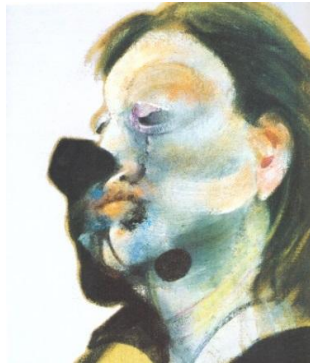

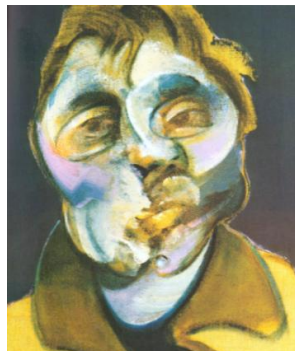**Fig. 14. Francis Bacon's painting of Isabel Thorne**

Fig. 15. Francis Bacon's self portrait

Fig. 16. Francis Bacon's painting of George Dyer

Fig. 17. Sample meaningful point for deformation

Fig. 18. Sample meaningful points for deformation
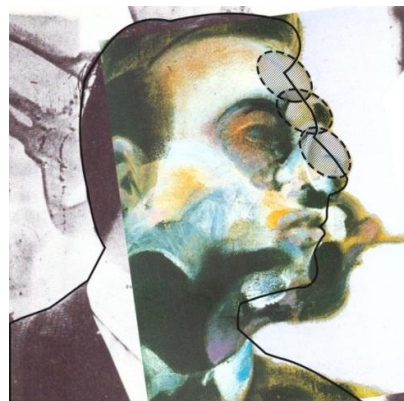

Fig. 19. Sample meaningful points for deformation

5. CONCLUSION

Along with the growth and development of science, the importance of training and the methods of transferring scientific achievements has doubled in the last century. In the meantime,

the development of training methods has become an independent science field. Art, as a branch of science, is not isolated from this discussion, and its training and critique methods have always been highlighted; especially with the leap in the development of the artistic style of the twentieth century, the importance of analyzing and presenting easy educational methods has been very important. Because the contemporary art route passes through modern art and the lack of deep understanding of the modern art prevents the contemporary artist from the recognition of the path ahead of the contemporary art. In this regard, in this paper, we presented a method for training and analyzing the deformation using meaningful geometry. A method that protects the intellectual independence and individuality of the learners without entangling their minds in common stereotypes in art education. In this way, we have looked at the design of the form in the style of Expressionism from the perspective of meaningful contours. At the end, we analyzed some paintings to illustrate the work of proposed methods one and two.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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