GENERATION OF ABSTRACT FORMS AND COMPOSITIONS BY TRANSITION FROM ONE FORM TO ANOTHER

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Abstract: *The search for new forms and compositions has always been on the agenda of creative process. For this purpose, various creative methods and sources of inspiration have been searched for over time to reach the desired result.*

This paper is based on a technique widely known in combinatorics - "binomial fantasy" - and the ever-developing computer technology. It addresses the ability to generate abstract forms and compositions using geometric transition from one object to another.

Keywords: DESIGN, METHODS OF CREATION, ABSTRACT COMPOSITIONS, BINOMIAL OF FANTASY

1. Introduction

The search for new forms and compositions has always been on the agenda of creative process. For this purpose, various creative methods and sources of inspiration have been searched for over time to reach the desired result.

The methodology of creative search uses a wide range of heuristic methods and operations, which invaluably assist the search for original, non-obvious solutions.

"Binomial of fantasy" is a technique widely known in combinatorics. In it, two existing objects or more are combined into a new idea.

This paper is based on the above-mentioned "binomial of fantasy" and the ever-developing computer technology, which because of its computational power allows the generation of a large number of objects over a short period. It addresses the ability to generate abstract forms and compositions using geometric transition from one object to another.

2.Assumptions and ways of addressing the problem

The purpose of this paper is to explore the possibility of generating abstract forms and compositions by two-dimensional transition from one object to another.

Contributions are expected in the following directions:

1. Using synthesis as an instrument for generating abstract compositions.
2. Changing the "author-subject-audience" model of creation.

Problems to be solved:

1. Exploring the possibility for generating transient abstract compositions.
2. Finding practical application of the results achieved by solving the first problem.
3. Analyzing the impact of the proposed approach on the "author-subject-audience" model of creation.

3. Solving the scientific problem

EXPLORING THE POSSIBILITY FOR GENERATING TRANSIENT ABSTRACT COMPOSITIONS

The main variables that we could manage solving this problem are two - the form of source objects and the number of transitions realized. The algorithm and mathematical models that underlie the program of creating transformations remain unknown to us.

Simple transitions from one form to another are known and widely applied in practice. The transition shown in Figure 1. demonstrates how to generate intermediate images that carry the traits of both raw and original forms (marked with the letter "O").

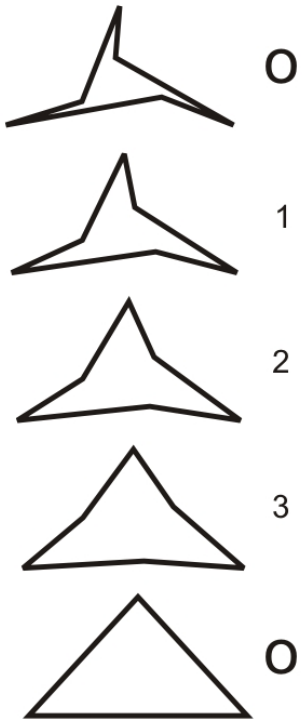

Figure 1. *Transition from one form to another, carried out in three intermediate steps.*

The same principle is used in the generation of complex abstract compositions. The main difference is in the output format.

Interest to study are transitions obtained by mixing complex topologically nonequivalent forms. Their results are of an unpredictable nature due to the complexity of the contours of the source objects.

Figure 2 shows a three-step transition between two objects (in this case - a horse and a crane), radically different in form, color, orientation, number of components. Each of the resulting steps is a separate composition with varying degrees of abstraction and belonging to one of the two original images.

Figure 2. *Transition from one form to another, carried out in three intermediate steps.*

Figure 3. *Step 1 (top) and Step 3 (bottom) of the transition realized in Figure 2.*

Figure 3 shows a closer view of the compositions from step 1 and 3 of the transition realized in Figure 2. It is quite reasonable for questions such as "How could similar intermediate steps be realized?" to arise as well as "Why only three transitional forms were selected in this case?"

In practice, using a computer program for generating such transitions enables us to realize hundreds of steps (in this case the maximum number may breach 999) over a very short period (within a few seconds to several minutes depending on complexity).

Only three transitions have been used for the realization shown in Figure 2 they have been sufficient to demonstrate the idea. Normally, the steps would be more in a more serious study of transitions between objects.

Figure 4 shows a conversion between the same two initial forms as in Figure 2 (here a horse and a crane) but already in eight steps.

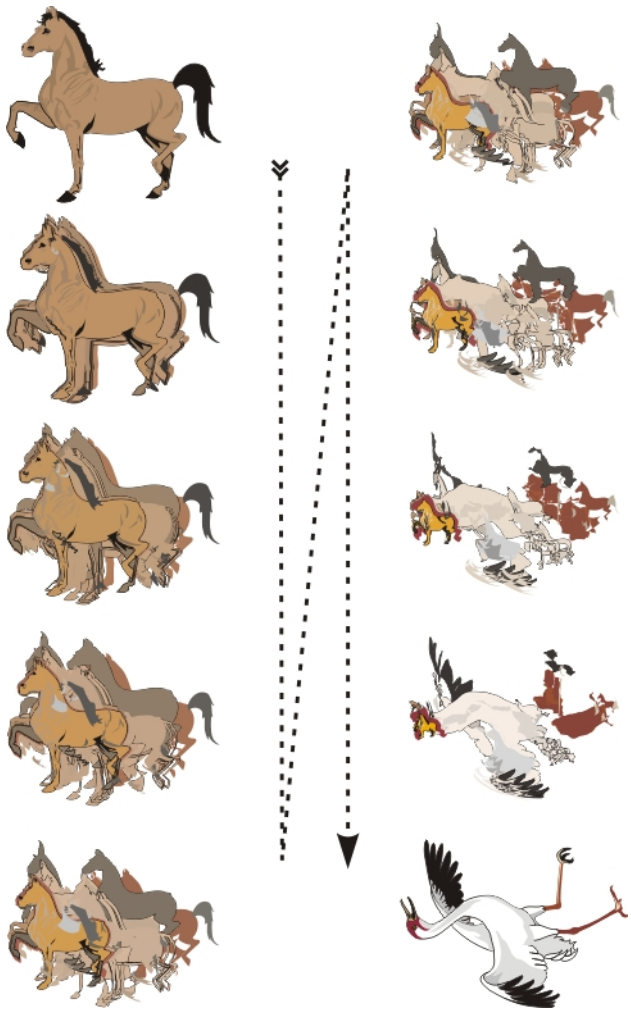

Figure 4. *Transition from one form to another, carried out in eight intermediate steps.*

It has to be noted that in this case the number of transitional steps is not the most important thing, because experiments show that when it is over 10-15, then the results are quite approximate. The selection of input objects is much more important because they determine the palette and type of intermediate transitions.

Two transitions are shown in Figure 5 between a lobster and a vintage car and between a yellow ant and the same vintage car. The goal again is to explore the variety of compositions that can be realized in these types of transitions.

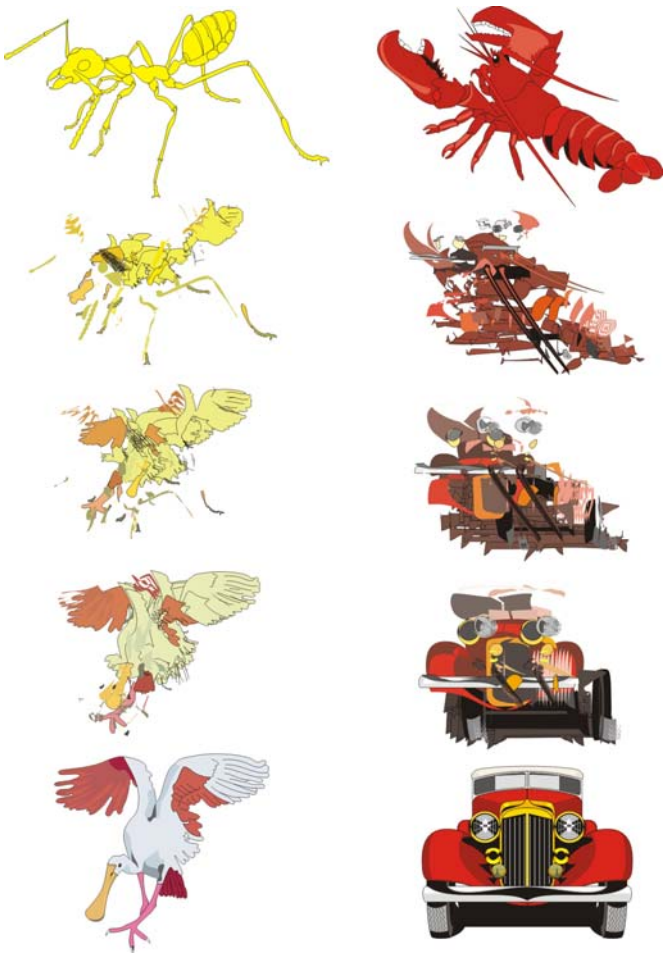

Figure 5. *Various transitions from one complex form to another carried out in three intermediate steps.*

FINDING PRACTICAL APPLICATION OF THE ACHIEVEMENTS TO DATE

It is clear that the transition between two objects discussed by far could be realized in a short period of time a large number of abstract compositions. The main question that arises is what to do with them. Good examples of newly created figures could be useful in several ways:

1. As stand-alone, complete abstract compositions (four such examples are shown in Figure 6)
2. As the basis for future work. The objects created are subject to relatively easy editing of both form and color and could be edited to achieve the desired effect or to become part of a larger work.
3. It is possible for transitional forms to be used as objects that provoke every individual's imagination and creativity in a different way.

Figure 6. *Four abstract compositions generated by transitions between complex forms.*

ANALYZING THE IMPACT OF THE PROPOSED APPROACH ON THE "AUTHOR-SUBJECT-AUDIENCE" MODEL OF CREATION.

So far, the benefits have been subject to study that could be derived from the approach under discussion.

Negative consequences that can be outlined are that in practice the process of searching for the form is totally profaned and everything comes down to selecting the appropriate image. Indeed, this finding brings skepticism but in practice the process becomes ever more visible in all areas of creative activities [1].

In the creative process, we have known so far, the author is at the beginning of the process and is directly involved in the creation of his work. It is possible for him to use sometimes-different methods of lifting heuristic barriers or challenging and stimulating the imagination, but he puts himself in the work he creates, and when it is ready, he brings the audience in.

In the method of generating abstract compositions investigated in the study, the author's position has been changed. The classic model has undergone transformation. The new line is shown in Figure 7.

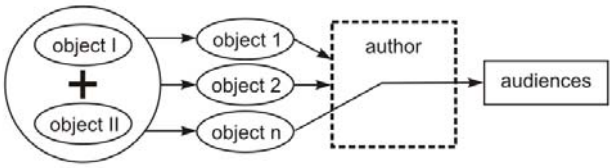

Figure 7. *Transformed model of the "author - object - audience" relation.*

The author stands on the side of the audience. Ready-made solutions "appear" before him and he begins searching for the most appropriate among them, which he would bring the audience.

4. Results and discussion

The proposed approach has a creative element.

In fact it is a synthesis of research ideas and motives by applying a technique known in combinatorics - "binomial of fantasy" - combining two genetically distant objects.

The very process of generating intermediate modifications traces the popular tendency to follow and trace an "axis of choice."

The results are derivatives striking human imagination and fantasy, each of which may be a newly synthesized single solution with a specific type of semantics.

5. Conclusion

The method of generating abstract forms and compositions discussed is not intended to enter the territories of suprematism, tachism, vorticism or any other modern abstract movement and tendency in art.

It demonstrates how computer technology can be put in service of the creative process and what eventually would some of the consequences of "mechanized art" be.

6. Literature

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