ARCHITECTURAL COMPOSITION OF NON-SPREADING LINE SURFACES

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ANNOTATION

This scientific article discusses the issues of consideration of canoids, cylindoids, paraboloids as a result of the study of the basis of the laws of formation of the architectural composition of nonlinear linear surface patterns in the science of descriptive geometry.

Keywords. Canoid, cylindoid, paraboloid, discrete points, axiomatic, composition, computer geometry, synthetic, formal model, anametic, parameter, complex, perspective.

INTRODUCTION

The law of formation of non-extensible linear surfaces is studied in the science of descriptive geometry. Depending on the shape of the surface guides, non-propagating linear surfaces are divided into conoid, cylindrical, paraboloid types (Figures 1, 2).

The following algorithms are used to represent these surfaces in a computer graphics manner.

- Surface guides are placed on the mold plan [1]

- The constructor, consisting of (directional or synthetic fibers) direction, is placed on the reference lines on the measured coordinates.

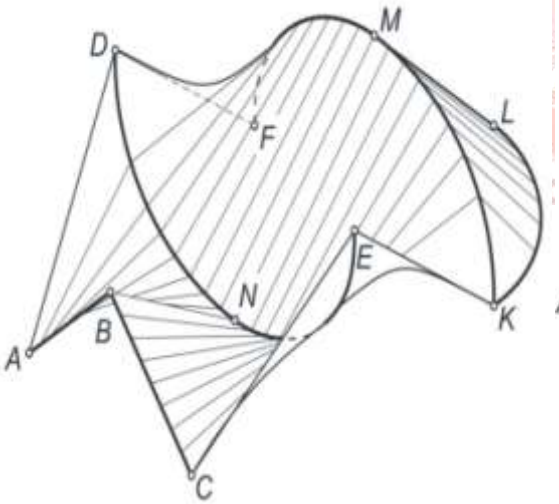


Figure 1.

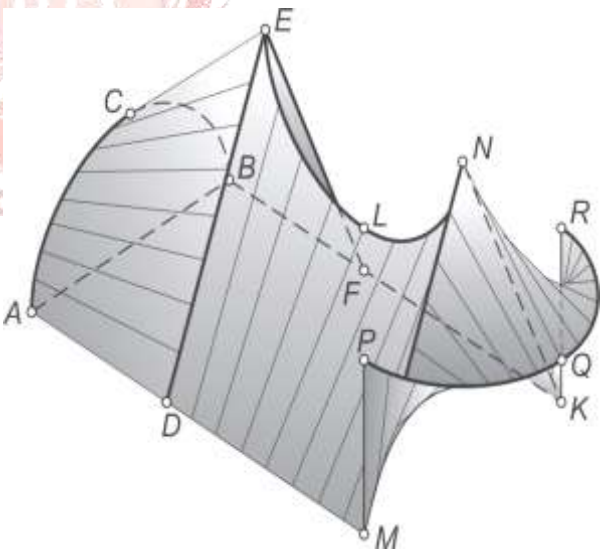


Figure 2.

We describe this as a formalized geometric model. To move from a formal model to a computer geometry model, we write the following analytical equation with respect to the plan:

- Determine the control parameters from the surface equation;

- We make it convenient to prove the coordinates of the equation;

- To calculate the coordinates of the surface and find the direction of the armature in computer graphics, it is necessary to write the surface equation at discrete points.

Special graphic software and an axiomatic algorithm are used to visualize and depict nonlinear linear surfaces in the form of computer graphics.

These include:

- Draw a given dimensional plan;
- To study the results of the placement of fittings in the given plan;
- Setting the shape of the reference line to the boundary line;
- Connect the constructors in the coordinates of the same name.

To find the architectural composition of non-spreading linear surfaces, it is necessary to place the surface molds in a complex plan. This axiomatic relationship is written as follows:

- Determined using the parameters of the reference lines from the computer memory;
- Reference lines are placed in the plan;
- The composition is created using the scales of turning, pushing, placing, rotating, enlarging and zooming computer graphics;
- The scale of the architectural composition formed by the placement of molds is determined;
- Images and images are projected in axonometric or perspective view [2].

To make the architectural composition of the molds look like awnings or synthetic coverings, special software of computer graphics is used. The above logical considerations consider the theoretical substantiation of the patterns of nonlinear linear closures in the practice of descriptive geometry, computer geometry, computer graphics, and the creation of practical architectural composition projects:

1. Let the formal geometric model of the non-spreading surface be conoid.

Let the geometric conditions be given as follows:

- The first reference circle, ellipse, parabola, etc. can be an arbitrary curve. The second guide consists of a straight line and is placed in an arbitrary position;

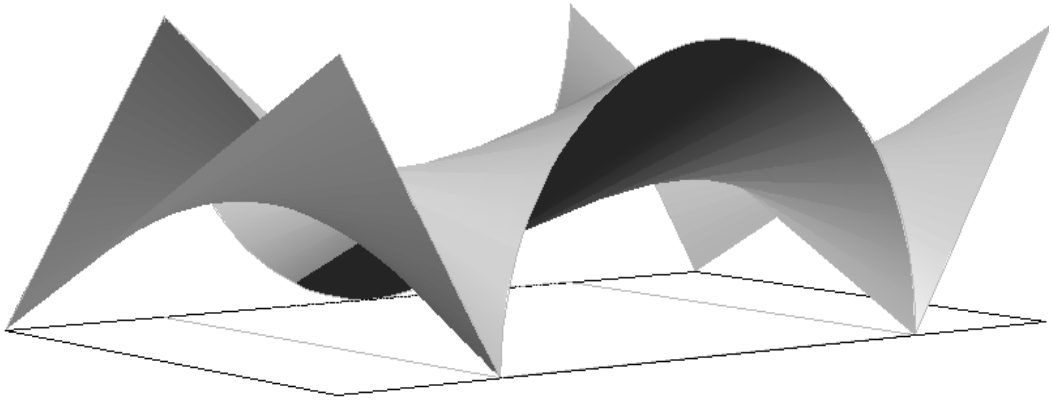
Assume that the builder is located in a straight line (armature) - parallel to the plan.

2. The conoid surface is defined in computer geometry as follows:

- The point M (xo, yo, zo) is taken on the first reference line;
- On the second reference line from the point M (xo, yo, zo) is carried out an experimental plane;

-The conditions for the straight line to lie in the plane of the test and to pass through the point are determined.

Figure 3 shows computer graphics models of the composition of the surface molds.



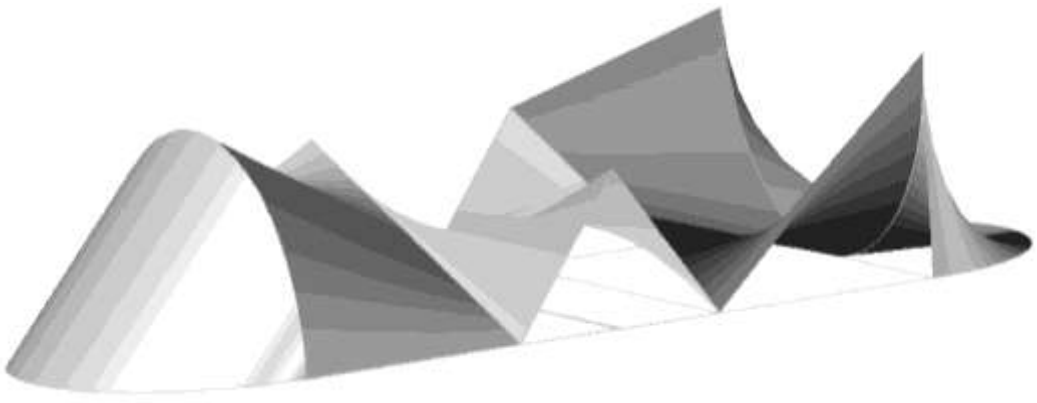


Figure 3.

Using the motion parameters, the equation of the conoid surface determining the position of the constructors is generated and written in the coordinate method as follows:

$$y = xtg\frac{z}{h} \quad \text{ёки} \quad \frac{y}{x} = tg\frac{z}{h}, \quad \frac{z}{h} = arctg\frac{y}{x},$$

$$z = harctg\frac{y}{x}$$

the equation of the conoid surface is derived.

To move on to computer graphics, we make the surface equation look discrete.

$$z_i = harctg\frac{y - y_i}{x - x_i} \qquad i=1, 2, 3, \ldots n$$

Definition 1. Computer geometry information of surfaces is created as a result of changing the shape and position of the nonlinear surface guides relative to the plan.

Definition 2. A computer geometry library of applications is used to represent nonlinear linear surfaces in computer graphics [2].

Definition 3. To create an architectural composition of non-spreading linear surfaces, values of motion in the surface equation are set in accordance with the standards of design practice.

Based on the logical geometric results given above, we present the equation of the geometric model of nonlinear linear surfaces as follows:

$$\frac{x - r\cos\frac{z}{a_1}}{\frac{a_2^2 + z^2 - a - z^2 r\cos\frac{z}{b_1}}{2(a - a_2)}} = \frac{y - r\sin\frac{z}{a_1}}{\sqrt{r_2 - (\frac{a_2^2 + z^2 - a^2 - r^2}{2(a - a_2)} + a_2)^2 - \sin\frac{z}{b_1}}}.$$

If we write this equation in discrete form, we get the calculation formula of the computer geometry in Fuy:

$$\frac{(x-x_i)-r\cos\frac{z_1}{a_1}}{\frac{a_2^2+z^2-a-z^2}{2(a-a_2)}r\cos\frac{z_i}{a_1}}=\frac{(y-y_i)-r\sin\frac{z_i}{a_1}}{\sqrt{r^2-(\frac{a_2^2+z_o^2-a^2-r^2}{2(a-a_2)}+a_2)^2-r\sin\frac{z_i}{b_1}}}.$$

here $O \le x - x_i \le 1$, $O \le y - y_i \le 1$, $O \le r \le 1$, $O \le a_1 \le 1$, $O \le a_2 \le 1$, $O \le r_i \le 1$

By placing the coordinates of the zi-forming line through the values in this equation, it is possible to create an architectural composition in which the directions are different.

Figure 4 shows the architectural composition of the molds. To create an architectural composition, intermediate options are taken from the library of surfaces.

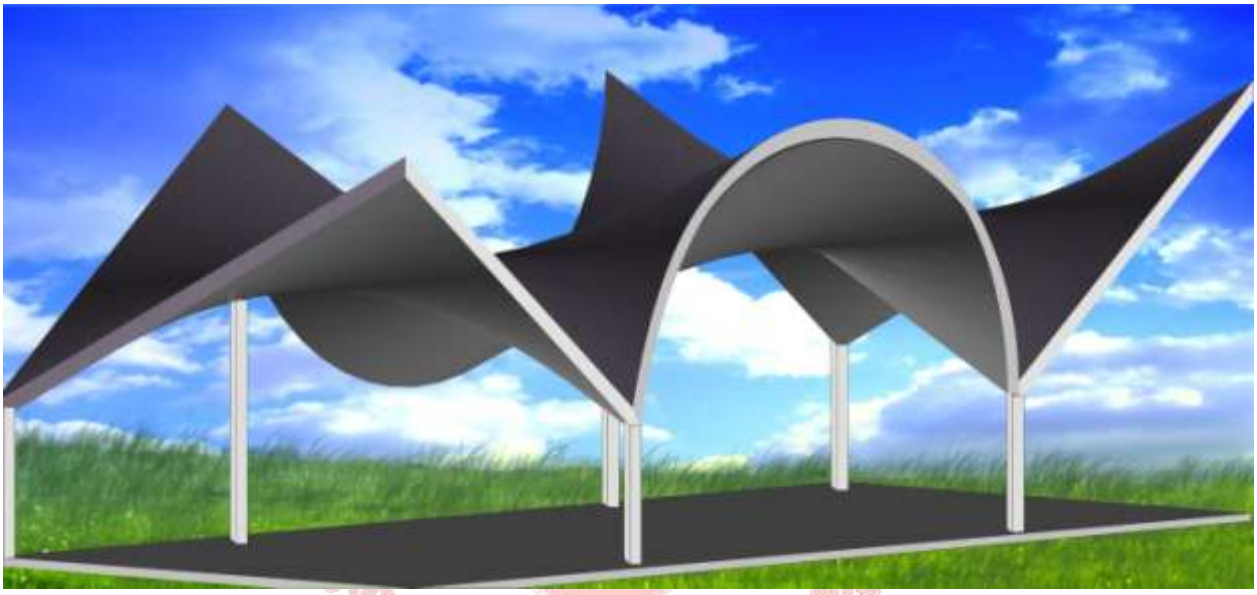


Figure 4.

From the above examples it can be concluded that it is always expedient to create and apply in practice a linear surface - a surface constructor with several parametric spatial surfaces.

REFERENCES

1. Ш.К.Мурадов ва бошқалар. “Чизма геометрия курси”. -Т.: Молия-иқтисод, 2006.
2. Е.Рўзиев, А.Аширбоев. “Муҳандислик графикасини ўқитиш методлари”. – Т.: “Янги аср авлоди” нашриёти, 2010.
3. Б.Воҳидов. “Чизма геометрия курси”, ўқув қўлланма, - Самарқанд 2010.
4. Жураев, Тожиддин Хайруллаевич, Обиджон Шукуруллаевич Сувонов, and Хазраткул Раимкулович Сапаров. "РАЗРАБОТКА КОНЦЕПЦИИ СИЛЛАБУСА ДЛЯ УЧЕБНОГО ПРОЦЕССА ГЕОМЕТРО-ГРАФИЧЕСКИХ ДИСЦИПЛИН." Образование и проблемы развития общества 3 (2020): 32-39.
5. Жураев, Тожиддин Хайруллаевич, et al. "ВОПРОСЫ МОДЕЛИРОВАНИЯ СЛОЖНЫХ ТЕХНИЧЕСКИХ ПОВЕРХНОСТЕЙ ПРИМЕНЕНИЕМ ДУГИ ЭЛЛИПСА." Техника и технологии: пути инновационного развития. 2020.
6. Агеев, Евгений Викторович. "ББК Ж. я431 (0) Т38 МТО-51."

7. Murotdilloevna, A. M. (2021). The role of museums in the activities of the university at bukhara state university. *ACADEMICIA: AN INTERNATIONAL MULTIDISCIPLINARY RESEARCH JOURNAL*, *11*(1), 285-290.
8. Botirov, J. S., Bakaev, S. S., Avliyakulov, M. M., Shirinov, A. L., & Abdullaev, S. S. (2021). The same goes for art classes in private schools specific properties. *Journal of Contemporary Issues in Business and Government*, *27*(2), 1643-1650.
9. Islamovna M. D. The value of using the autocad program in the works of machine-building drawings for building fastening parts //Proceeding of The ICECRS. – 2019. – T. 3
10. Islamovna, M. F. I. F., & Akhmadzhonovich, M. B. (2021, January). ARCHITECTURAL DESIGN TECHNIQUE. In *Euro-Asia Conferences* (Vol. 1, No. 1, pp. 310-312).
11. http://koet,srktsu/ru/vestnik/2012-4/2/2.html.
12. www.search.re.uz.-Ўзбекистоннинг ахборотларни излаб топиш тизими.
13. www.ddi.ux- “Рақамли ривожланиши дастури”.