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**DIFFERENT GEOMETRICS IN CERTAIN OBJECTS INNOVATION OF
ARCHITECTURAL ELEMENTS IN THE FORM PROPOSAL FOR CREATION ON THE
BASIS OF TECHNOLOGIES AND ANALYSIS**

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Annotation:

The article researches the creation of ornaments and elements in modern techniques and applications. Due to the growing demand for ornaments and elements of national architecture, there is a need for a product that meets the demand in the short term. The article discusses the formation and development of architectural elements, foreign experience, history, and their significance today. Modern programs, techniques, raw materials that assist in the creation and design of architectural elements are considered, with a special emphasis on modern technologies that meet the conditions of Uzbekistan. Inspired by the collected data, project proposals for the creation of modern architectural elements were presented using a variety of programs.

Keywords: ornament, column, programming. Rhino, architectural element, modeling, prototyping, design, bubble surfaces, muqarnas.

注解 :

文章研究了现代技术和应用中装饰品和元素的创作。由于对装饰品和民族建筑元素的需求不断增长,因此需要一种能够在短期内满足需求的产品。文章讨论了建筑元素的形成和发展、外国经验、历史及其在今天的意义。考虑了有助于建筑元素创造和设计的现代程序、技术和原材料,特别强调符合乌兹别克斯坦条件的现代技术。受收集到的数据的启发,使用各种程序提出了创建现代建筑元素的项目建议。

关键词 : 装饰、专栏、编程。犀牛, 建筑元素, 建模, 原型设计, 设计, 气泡表面, muqarnas。

As far as we know, the ability to do a lot of work in 3D applications is rich in several conveniences. A job can be done through three or four different programs. But at the same time, working in programs has its challenges, of course. We can easily do a job through a

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program, or vice versa, we can make our job harder. The architect and designer, therefore, have to master many applications very perfectly.

The main purpose of this article is to model and prototype architectural elements, increasing the efficiency of processing of national architectural elements on the basis of modern technologies.

Research objectives, depending on the purpose of the article, include:

- Study of architectural elements;
- Analysis of design methods and identification of basic requirements for design tools;
- Modeling of architectural elements using modern software.

The main issues and assumptions of the article:

- Thorough study of ornaments and architectural elements;
- Design of national architectural elements in a modern style;
- Quick and easy design and implementation of various national ornaments on national architectural elements, especially columns;
- Reducing the cost of national architectural elements.

Architectural elements are very important in the organization of a building, and the architect gets acquainted with the structure of a building before designing it. Since this article deals with architectural elements, we decided to introduce it to the fragments first.

Nowadays, almost all projects are created using modern computer programs. Creating ornaments and architectural elements in a short-term format on the basis of modern technologies and

programs in our country, saving time, reducing manpower, manual labor, achieving precision in ornaments and elements, and creating and prototyping models in programs compatible with foreign equipment based on new technologies .

3D modeling involves the development of a 3D model (or three-dimensional carcass model) using specialized software. A three-dimensional model is created using many points that are interconnected by lines and curved surfaces. The field of 3D modeling is constantly expanding. It is as follows:

games, ie modeling of realistic characters; medicine - the creation of separate models of organs of the human body; engineering - development of models of vehicles, new equipment and structures; cinematography - covering a variety of special effects and the creation of imaginary characters. Also in the field of advertising, 3D

modeling has been used extensively.

The resources studied and recommended throughout the article can then serve as a guide for the reader who wants to gain an understanding of the place, structure, history, origin, and innovative techniques of ornament and architectural elements in national architecture.

A computer model or digital model is a computer program that runs on a separate computer, a supercomputer, or a set of interacting computers (compute nodes) that perform an abstract model of a system. Computer models have become a common tool for mathematical modeling and are used in physics, astrophysics, mechanics, chemistry, biology, economics, sociology, meteorology and other sciences, and in radio

electronics, mechanical engineering, automotive and other fields. Computer models are used to gain new knowledge about a simulated object or to estimate the behavior of systems that are too complex for analytical research.

Computer modeling is one of the most effective ways to study complex systems. Computer models are easier and more convenient to learn because of their ability to perform computational experiments where real experiments are difficult or may yield unpredictable results due to financial or physical barriers. The logic and formality of computer models make it possible to identify the key factors that determine the properties of the object being studied — the original (or whole class of objects), specifically the response to changes in the parameters and initial conditions of the simulated physical system.

The construction of a computer model is based on the abstraction of the specific nature of events or objects under study and consists of two stages - first the qualitative, then the quantitative model. Computer simulation is a series of computational experiments performed on a computer to analyze, interpret, and compare simulation results with the actual behavior of the object being studied, and to further refine the model as needed, among others.

Now we will look at ways to implement patterns that can be applied to columns, which are architectural elements, through three or four different programs, and explore their convenience.

Sketchup software. Sketchup software allows you to model many 3D models, create architectures, interior designs, and draw standard shapes. It should be noted that this software has

an intuitive interface. Sketchup is a useful 3D modeling program that allows you to design images and objects in three dimensions. Using simple tools, you can design custom-made views down to the smallest detail.

There are some difficulties in working with the design of a column in this program: The program can draw the corners of columns, but the ability to place patterns on columns in a circular column creates some difficulties. We have considered this in the course of our work. In Figure 1, we show based on the sequences.

To work in the program can not be done without the use of paid services over the Internet. Still, we tried to work it out.

3D modeling software allows you to create basic 3D models of characters or objects. In fully customized applications, you provide the tools you need to fill your designers with precise details. There are many 3D modeling programs on the market. Among the highest rated prices are shown here:

In fact, 3d modeling is important in our modern society. Today, 3D modeling is widely used in Marketing, Architecture and Design, Cinematography and other fields. 3D modeling plays an important role in the process of creating a prototype of future buildings or presenting a product made by any company. With the advent of 3D printing, 3D modeling has taken it another step further and has become a much-needed field in today's society. Now everyone has the opportunity to print on a 3D printer, whether it is a drawing or a drawing object downloaded from the Internet, a designer model or the character of our favorite cartoon character. Of course, not everyone understands how to work and model in

3D Software. As a result, the demand for 3D modeling professions has grown over the years.

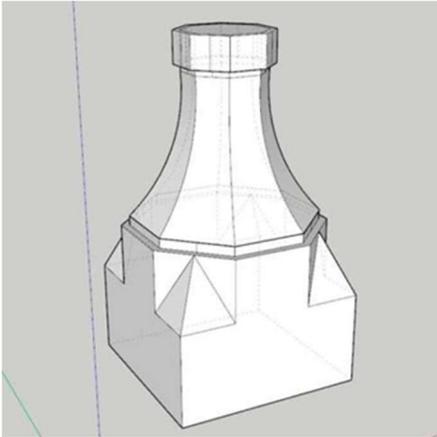


Figure 1

Auto CAD software. Nowadays, three-dimensional computer modeling tools are in the spotlight of users, and this is no coincidence, of course. Their use allows you to perform high-quality design work, as well as the user to quickly and efficiently make drawings and print them on paper.

A method of using Auto CAD, which consists of a universal graphics system environment for designing computer modeling of these tasks, is proposed.

The most important characteristic of any software today is the ability to use it in conjunction with other programs. Therefore, the Auto CAD system has great capabilities, allowing you to animate three-dimensional models by exporting your product to 3D Studio. In Figure 2, we begin to develop our columns in these programs. First, we place the column image on the handle and release the dimensions.

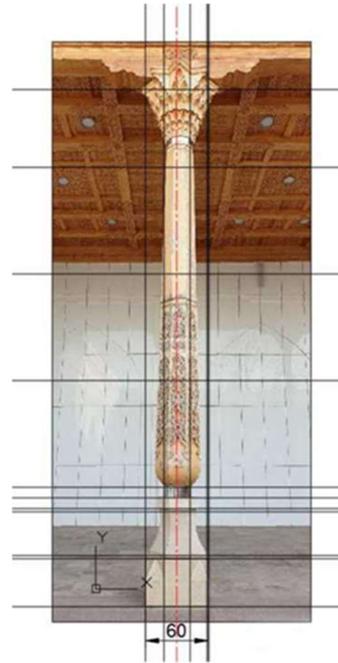


Figure 2

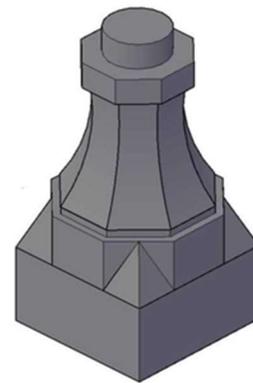


Figure 3

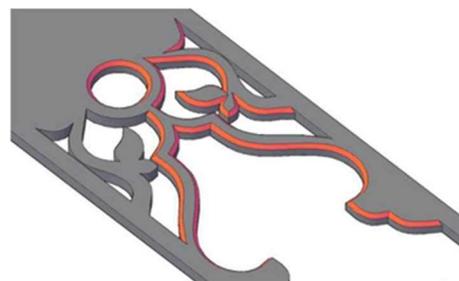
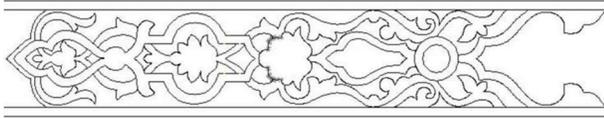


Figure 5

We've drawn the columns, and now we're going to start drawing the ornament. Figure 4

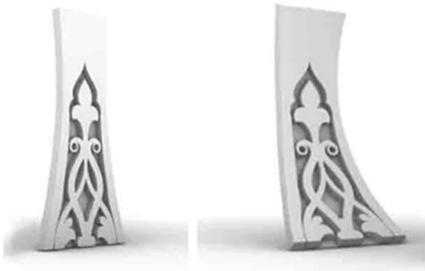
Let's make embossments on the drawn ornament
Figure 5

One of the disadvantages of Auto CAD is that
you can't place ornaments on the circles. Figure
6

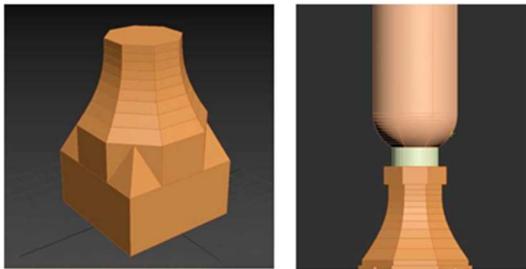


4- figure

Now let's start drawing based on dimensions
[Figure 4]



6-Figure



7-Figure

One of the disadvantages of Auto CAD is that
you can't place ornaments on the circles. Figure
6

3D Max software. This program is widely used
in scientific research of three-dimensional
graphics, engineering design work, construction
of computer models of physical objects. Three-
dimensional graphics are the most complex,

comprehensive line that is part of computer
graphics. A user working with three-dimensional
graphics should know areas such as design,
lighting, moving objects and cameras, and using
sound and display effects. It should be noted that
three-dimensional graphics programs place very
high demands on the knowledge of computer
devices, software, and the designer who works
with them. Now in this program, we will model
our column Figure 7

As we can see in the workflow, working
on exact dimensions in this program causes some
complexity and uncertainty. However, in the
process of rendering a model based on ready-
made measurements, it is unlikely to be found to
reach the max program. Throughout our article,
we will also be working on another program, the
Rhino program.

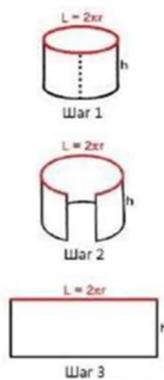
Rhinoceros 3D is a professional modeling system
mainly using NURBS technology. Rhino allows
you to create, edit, analyze curves, surfaces, and
objects.

Full work with NURBS-objects. The system
works efficiently with objects of any complexity
and size. This can be technical and simulation
from valve to liner

Modeling. You can create and edit any
combination of curves, surfaces, geometric
objects, and then export the created models to
any format.



8-figure



9-figure

This program can easily replace 3ds Max and Auto Cad at the same time. It allows you to easily create drawings, models. Traditionally creating them takes a lot of time.

Based on the above information, using the Rhino program, we took one of the columns around Mustaqillik Square in Tashkent as a model and began modeling it in this program. Ornaments of the column in Independence Square.

In particular, NURBS technologies are used in the design of the equipment case and its basic forms. An intuitive user interface, independently compiled software modules designed to expand the availability of a highly specialized set of computer program capabilities allow Rhinoceros 3D to surpass 6 different automated design systems in solving these problems. Thus, for

example, the construction of a three-dimensional object of a certain height and radius is done in just a few moves, and the ability to save 3D allows format models to easily view and edit 3DM files. Graphic applications on Windows, Mac, Linux platforms. Rhinoceros 3D software has become widespread and an indispensable tool for many engineers.

First, we went to the front of the column, which was built to commemorate the martyrs of Independence Square in Tashkent. We studied the column ornaments in depth. In the Rhino program, object resolution requires a great deal of attention. If there is a slight error in the measurements, it is clear that in practice the work we intend to do in 3D production techniques will not yield the results we expect. So we first measured the circumference of the column using a simple string. Getting the size of the column Figure 8

From our work in the Rhino program, we calculated the size of the circumferential part of the column based on the formula using the formula for determining the cylindrical spread available in geometry and drawing sciences and found the radius of the column. Find the radius of the column in Figure 9.

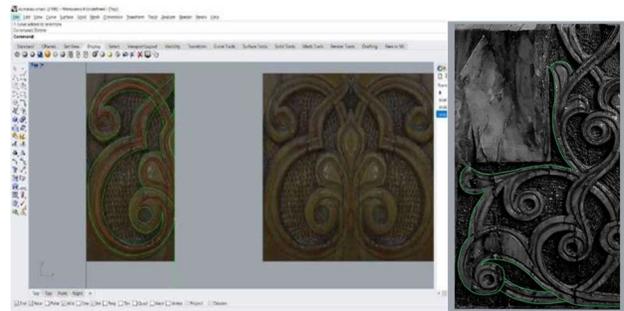


Figure 10

The next thing we need to do directly photographing the ornament on the column, Rhino based on the SPLINE command to open the speed in the program Draw a line over the ornament Figure 10

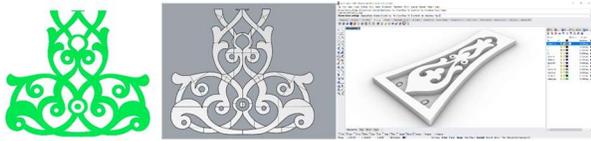


Figure 11

We can turn the finished ornament lines on the surface Figure 11

We can turn the finished ornament lines on the surface. Based on the measurements, the backs of the column are also made, and our drawn patterns are placed on them, indicating the place where the pattern will be placed. An embossed pattern of 10mm size is then created. Creating embossments from drawn pattern surfaces.

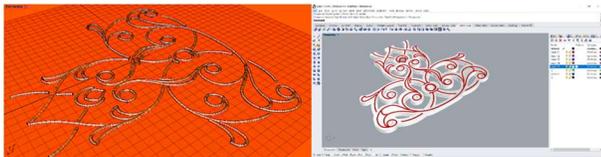


Figure 12

If you look closely at the existing column, there are again the same pattern carvings on the pattern surfaces. We can also thicken the line pattern we drew earlier.

Now let's move on to making the more complex parts of our column. At the top of our pattern, a combination of semicircular surfaces bears a sphere

The most convenient aspect of the Rhino program is that in this program you can easily create the desired circular shape and quickly and

easily place the desired pattern on that shape. We then place our pattern on the surface of the drawing based on the measurements.



Figure 13

We bend the pattern on the finished surface at the calculated degree. In this process, we draw a semicircular line at a certain degree determined earlier, and bring our pattern on the surface to the corners of this semicircular arc. As a result, our patterned surface enters the state of our previously drawn semicircular line. In the same way we place the pattern on the part of the sphere. In this way, all parts of our columns are drawn and placed. We will place the detail of our finished model on our main model. Figure 13.

Now let's move on to drawing the top of our columns. In this program, the work performed in sequence is performed uniformly. First, the next part of the column is measured and its shape and patterns are drawn. Figure 14.

The general background behind the drawn pattern is folded along the column dimensions at a specified degree. When creating a 3D model, the main attention should be paid to the correct placement of the measurements. In some cases, incorrect calculations and incorrect measurements can prevent us from completing our work effectively. Moving on to the next part of our work, the drawn pattern that is drawn on our surface, which has been shaped into a circle, is turned into a surface and unnecessary areas are removed.



Figure 14

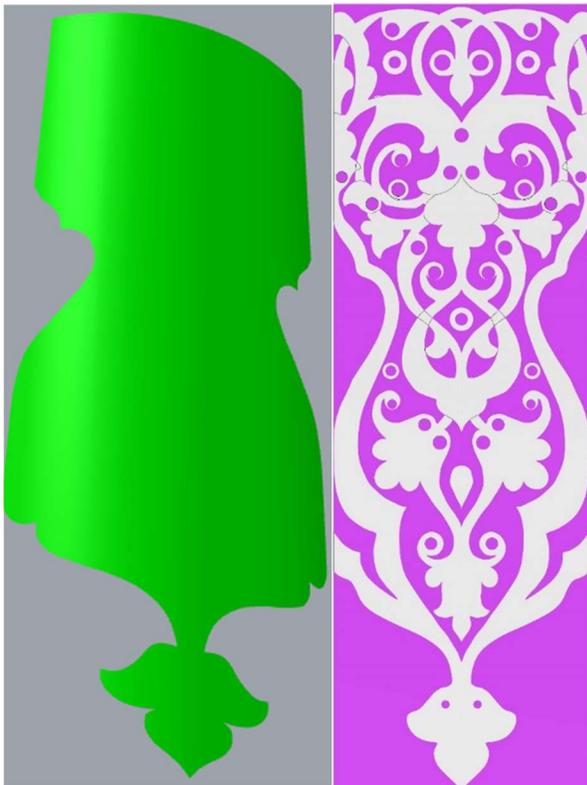
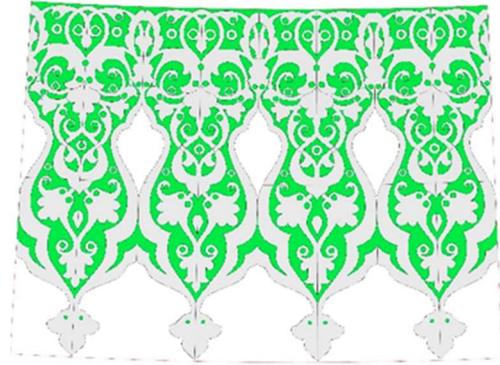
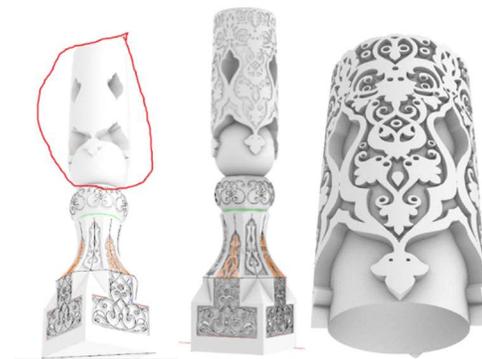


Figure 15



16-figure



17-figure

We place our drawn pattern on the drawn surface for the background. And we create a little embossing on our patterned surface. We multiply the finished embossed surfaces by the dimensions of the circle and join them together. Figure 16

We place our pre-connected patterned patch on our pre-assembled column. The result is such a look. When modeling patterned models, errors in the dimensions of their bulges should be avoided. Otherwise, you are more likely to miss one on top of the other. Figure 17

As you can see, the semi-general condition is almost ready. We can also see it more clearly by rendering. The upper parts of the column in the same sequence Figure 18.

It is also made by drawing the parts of the muqarnas. It is rendered and brought closer to its natural state. Based on this sequence, the top of the column is also drawn. The top of the column is the rendering mode. Here we have modeled our columns in full state. In this program, it is possible to model a variety of our national pillars, arches, etc. of this type. Figure 19



Figure 18



Figure 19

All of these programs known to us are downloaded over the internet. Therefore, this is not one of their advantages. It also discusses the ability to animate, render, 3D scan, transfer to CHPU machines, and their level of awareness. In

the following diagram, the indicators in this table are clearly shown in the column view. These programs covered in the article cover both traditional and modern methods of creating our designed models. In this table you can see a comparative table and diagram of today's latest techniques and programs that are compatible in the traditional way. The chances of creating our models designed in the traditional way through all programs are not high. Because it takes a lot of time to create them in the traditional way. That leads to time being infertile. One of the tasks of our article is to study the software and techniques that are useful in creating these fast, durable, aesthetically superior architectural elements.

As a result, each of our samples is delivered efficiently, uniquely and quickly in an open environment. Architectural elements that claim to be the main compositional element of the urban environment should be approached taking into account all natural and artificial factors during the creation of the architect and with an in-depth study of the unique structure and style of decor. Such an approach simply avoids copying and eclecticism. In solving this problem, it is necessary to try different methods, different techniques, because the achievement of aesthetic harmony using small architectural forms is a requirement of today.

Conclusion

In order to help architects who work tirelessly for the beauty of our city in Uzbekistan, as well as to provide spiritual support to carpenters, it is necessary to conduct a thorough study of the programs used by foreigners and their effectiveness, to study and implement their potential. For this purpose, we designed the columns decorated with national patterns in four

different programs SketchUp, AutoCAD, 3Ds Max, Rhino. These programs all have their advantages.

But it is in the design of these historical monuments that the Rhino program is the most acceptable. So the programming of the column model through the Rhino program, which is part of the architectural element we want to experiment with, has come to an end. Through this program, we have tried to show that models can be developed to improve the production of architectural elements using 3D equipment. Many models can be created through this program. Its possibilities are endless and the programming path is also easier.

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