

3D MODELING SOFTWARE FOR CREATING CONTEMPORARY CLOTHING JEWELRY

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Summary. *This article represents a theoretical study on the enumeration and the description of the most relevant and useful modeling softwares used for 3D design, for students, beginners and specialists in the field of fashion (jewelry), both for society and for the specialized educational unit. Also here are highlighted the strengths and prospects of modernizing education in the discipline of jewelry. With the help of necessary documentation, of specialized magazines, softwares, forums and interviews relevant information on the functions, characteristics, mass preference criteria of modeling applications and the design advantages of contemporary jewelry is inserted.*

The issue of implementing 3D software through which the design of contemporary clothing finery can be designed should be discussed by the empowered commissions of Moldovan institutions and companies. Consequently, their managerial and management decisions lead to a waste of material sources, and specialized staff today. The computer with its content is a didactic means that includes in the context other means, intensifying their instructive-formative features, completing them if necessary.

Keywords: *Software/jewelry modeling, adornment, 3D design, artistic processing of finery, contemporary clothing finery, computerized jewelry design contemporary.*

Introduction

All disciplines influence in one way or another various aspects of the jeweler's personality formation. It's impossible to accumulate a large amount of knowledge at a high level without giving enough time and a mentor who could assess the dynamics of progress and guide through useful advice at the right time. It's impossible to become a full-fledged specialist without a proper training. You can become a well-versed person in design or jewelry but not a real designer.

Knowing and being able are by no means the same thing. Besides an idea, the theoretical and practical research of some courses/disciplines specific to jewelry are necessary, receiving along the way all the objections and critical evaluations from the teachers. To reflect the concept it is necessary to know art but especially the evolution of finery. In the case of knowing the aspects mentioned above, a new problem arises- learning the stylizations, the harmony of the shapes, the chromatic range, the sense of volume and last but not least the graphics. Disciplines like 3D modeling, design, composition, painting, drawing... are an answer to the previous

question. Each of these disciplines is introduced in the process of forming the future jeweler, so that during his training he performs thousands of repetitions of the movements of hatching, staining, line each being under the tireless control of the teacher.

The new technologies of the information society intervene in the support of education, so the computer with its resources was introduced in education, students, teachers, researchers were involved in educational programs for the use of computers in higher institutions cycle 1, 2.

Currently 3D programs allow: creating three-dimensional graphics; image correction and processing; rendering (viewing); transmission of finite to print.

The art of jewelry has a particular inter and transdisciplinary feature, and a dual technical, scientific, practical and theoretical- it studies the formation of practical skills and fundamental systematic thinking for progress, activating student creativity, artistic-technical thinking of future specialists. [1]

Two decades ago, 3D modeling wasn't considered an absolute necessity in the jewelry industry. With the gradual improvement and development of milling machines and 3D printers especially with their gradual popularization in combination with declining costs, *computerized modeling* has also become, in demand, as machines organize their work based on the 3D model. Higher precision 3D machines are becoming more popular in various technical-industrial industries, including jewelry.

3D modeling of jewelry solves the problem of creating the necessary physical model (configuration) in the right raw material for future metal casting and not just using the 3D printer. [1 p.64] The final result- high quality due to the to the predetermined design of jewelry and its elements with maximum precision at the stage of engineering modeling in specialized computer applications.

Existent software on the market differs in modeling approaches. In total, three options can be listed for creating 3D models: solid, sculptural, procedural. Solid modeling is suitable for developing simple geometric shapes and creating 3D objects based on them. Sculpture or 3D carving is used to design digital sculpture at a high level of detail. Procedural modeling is the most advanced way of creating 3D. It is used for the design of complex mechanisms, precision parts. This approach for creating 3D is widely used by professionals.

Many tools are used for creating 3D models, with the help of which users with different levels of experience can create complex models and shapes. Sometimes it is necessary to use several software products to develop a model/article.

3D Jewelry modeling software

A list of applications that can be used to design and model 3D artistic and technologic jewelry is currently listed. Based on this list, some interesting conclusions can be drawn. First of all, it is necessary to list the specialized 3D Modeling Software for the creation of jewelry adapted to the given branch.

Blender – is an open-source 3D manipulation app. There are two reasons for its popularity- it has all the basic tools used in other professional publishers, unlimited possibilities and it is a free program. The program can be improved by functional

extension with various plug-ins. This software is constantly updated with most of the Google search links and informative videos on YouTube. Blender is difficult for beginners and requires time to master.

JewelCAD – one of the first specialized applications for jewelry modeling. Currently this app is considered obsolete. *RhinoGold* – is a promising program, it has become part of the MatrixGold. *Autodesk ArtCAM JewelSmith* – a specialized promising program (Figure 1).

JewelryCADDream – one of the most sophisticated programs for jewelers. The Protective Layering System (PLS) Technology and Floating Glass from software allow the modeling of the smallest details (example-gloss...).

Matrix – widespread application in the field of jewelry. This product is an enhancement to a number of features of the Rhinoceros application for industry-specific tasks. It is a component part of the MatrixGold (Figure 2a, b).

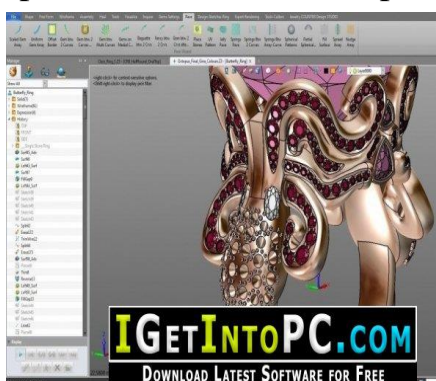


Figure 1. Prog. *JewelCAD*

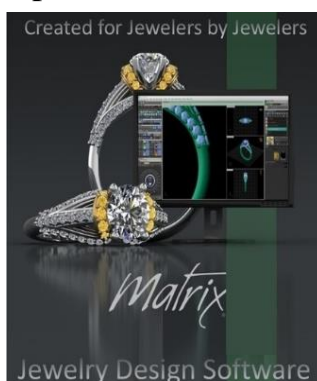


Figure 2a. Prog. *Matrix*
References:



Figure 2b. Prog. *Matrix*

Fig.1 <https://igetintopc.com/wp-content/uploads/2019/08/JewelCAD-Pro-2-Free-download1-3.jpg>

Fig.2a <https://ecss.sg/contact-us/>

Fig.2b https://ecss.sg/wp-content/uploads/2019/03/matrix_take_control.jpg

MatrixGold – Gemvision's product is growing and improving. It's the same Matrix with some modifications and additional features in the RhinoGold program. It excels in 3D printing, and also has a function called parametric history that allows you to view all the changes made during the process of making the jewelry item (finery). Advantages of high speed, possesses improved data trees, advanced rendering (Figure 3a, b).

RhinoGold – a 3D modeling version of Rhino 3D, is designed for jewelry design with features specially adapted for jewelry designers to create exceptionally detailed models. It has a large library with diverse components.

RhinoJewel – is an alternative to RhinoGold. It is meant for designing luxury jewelry, photorealistic rendering, its learning curve is smooth, which allows beginners easy research and assimilation. RhinoJewel is meant for a class of designers specializing in luxury jewelry design.

In conclusion, as can be seen, almost all specialized programs targeting the jewelry industry sooner or later cease to be supported by their developers and the evolution ends. Without developing and correcting its own errors, the application leaves the market and users' PCs, and in its place comes another, with new promises. This is primarily due to the fact that the jewelry industry is a narrow, specific market,

to rely fully and completely and to guide the development of 3D programs, on the minimum number of jewelers in the world. The list of buyer's jewelers-designers quickly ends and the program becomes minimally requested.

Rhinoceros- is a 3D NURBS modeling software program developed by Robert McNeel&Associates, used in industrial design, maritime design, architecture, car and jewelry design, CAD/CAM design, design, prototyping, graphic design and multimedia. Due to its variety, this program is frequently used, including among private and industrial jewelers. The most successful package today is Rhino 3D, V-Ray and Design Bundle an advanced 3D modeling with CAD tools combination. Rhino 3D is considered a milestone for thousands of product designers, industrial, transport designers, engineers, artists, architects etc. is probably the most capable 3D modeling app. V-Ray 5 for Rino allows designers to present models with an incredible performance (reality), reducing the need of a physical prototype. Accurate V-Ray playback for McNeel Rhinoceros enhance Rino's ability to handle large scenes and can even be used directly in Grasshopper. Based on this application, some more specialized programs are developed by third-party developers (Figure 4).



Figure 3a. Prog. *MatrixGold* Figure 3b. Prog. *MatrixGold* Figure 4. Prog. *Rhinoceros*

References:

Fig.3a. https://3d-rus.com/wp-content/uploads/2018/12/rings-gold-3d-model-stl-3dm.jpg1_.jpg

Fig.3b. <https://avatars.mds.yandex.net/get-images-cbir/4327993/6ZEn96OJ5UFHiyeYXbHdxw1121/ocr>

Fig.4. <https://livedoor.blogimg.jp/describe2700/imgs/7/e/7e5b217b9b8c682ba3ba.jpg>

It is also worth noting that for artistic and technological modeling of finery any other 3D development application is suitable, it is important to respect the volume rule, meaning the final 3D model must have a certain closed volume, and this can be done with Pixologic Zbrush, Autodesk 3ds Max etc. Of course, it is more convenient to use engineering applications because of their accuracy.

The introduction of specialized graphic applications in the training process leads to a significant transformation at various stages of research and practical realization of the designed articles. This transformation in the study system would pursue some hierarchical objectives: increasing the efficiency of research activities, developing individual study skills, increasing motivation, effective control over the implementation process.

3D design involves requesting specialized software and applications through which the palpable concept can be projected from scratch, or anticipating how it will visualize an idea physically, improving an item of adornment. Today, top companies have teams of designers who are the foundation of technical and creative processes through design programs.

Functions and characteristics of 3D modeling apps:

* creating three-dimensional graphics - models of scenes and three-dimensional objects for it;

* rendering (visualizing) - development of the projection of the article;

* image processing and editing;

* presentation of the final image on the output device (printer).

Advantages of 3D jewelry design:

* significant reduction in the time and costs of manufacturing samples and technological equipment;

* obtaining and coordinating the precise dimensions of the future article;

* the possibility of further revision of the 3D model and its use as a basis for other articles;

* realistic visualization of the virtually created 3D article;

* ability to determine the exact weight of the future product, special requirements for parameters and cost of raw material;

* use of the resulting 3D model to automate the processing of a mold or semi-finished mold tooling using specialized machining centers.

Criteria for mass preference of programs:

* easy to use. Free software is often used by beginners;

* the presence of a large set of tools for creating professional 3D models;

* the presence of new tools that offer possibilities to adopt a completely innovative approach to the creation of 3D design.

Various programs and applications have their own degree of complexity and specification. Some of them are designed for animation, others are suitable for designing complex mechanisms. [2 p.12]

Currently, the creation and development of methods and means of teaching computer-aided design are actively used in the process of design and technological training in production combined with traditional artistic articles and industrial products is one of the current objectives imposed on the educational environment higher profile.

The creative design process is very much alike that of an industrial factory. The marketing process is similar to the tasks that must be formulated during the selection and analysis of the information required at various stages of artistic design. [3 p.28]

Various software programs are introduced to improve efficiency. At the same time, the data obtained in one system can be used in another, so students and designers must have skills not only in traditional design but also skills in working in various graphics programs.

Along with the graphic programs in the study process will be used *presentations, educational multimedia products, blogs and publications.*

Previous global documentation has shown that the application of information and communication technology in education contributes to the improvement of results. But many teachers prefer classical teaching methods with a general indifference to technology, rejecting the dynamism of classes and stimulation with the help of computers and all associated tools. [4]

For people who are self-taught or have a background but want to increase their skills in the field, they can gain additional knowledge in the field of creating 3D design objects through modeling programs using textbooks, various specialized courses or wide-ranging tutorials such as: 3ddd.ru, render.ru, videotuts.ru...

There are currently hundreds of free 3D modeling software tools for beginners. Users can export the models, print them in 3D, post them online for download.

First of all, a 3D model must mathematically accurately reproduce every detail of the product and the relationship between them. And for an efficient design process it is necessary to create the 3D model in a few steps (not to the detriment of the quality of the design article). Given the capabilities of each system, it is necessary to understand how well it handles the type of product made by the designer according to the individual project.

When selecting the program, it is legal for the interface to be consecutive and identical in all system models. The logic of the system must match the product development processes from start to finish. It is recommended to select a product with a built-in information system, tutorials and an active online user community. It is welcome to include this product in the programs of technical universities - in this case, the task of finding specialists in the field of fashion with the necessary qualifications is much easier.

Conclusions

3D matrix3D program, Matrix Gold3D program, ArtCAM JewelSmith3D, RhinoGold3D, JewelCAD3D, Rhinoceros ... the list goes on and there are other applications where some studios are developing their own tools. Fundamental elements of analog modeling are discovered in the research process, so learning another application will not be a difficult process. Most specialists operate with several applications at the same time. Most of the applications described above offer a free student license or demo version.

Today, *3D modeling of contemporary jewelry* (finery) is an integral part of any jewelry production, the enterprise, in the development of a prototype (article designer) for *mass production*, as well as an integral part of the *production of a unique piece (individual design)* for replicating the model.

The world of jewelry design is constantly growing, as is the competition. Before deciding to step into the field of jewelry design, choosing the right software is the least you can do to maintain a competitive efficiency being one of the opportunities in the field.

Thus, jewelry acquires new values, forming one of the specific fundamental elements in contemporary education (fashion field), a course that aims to integrate the student in society. 3D modeling tools are used to modify particular ideas in samples, aesthetic prototypes for a variety in a branch.

But knowing computer graphics does not make you a designer by itself. Design, especially that of jewelry and finery, is primarily a philosophy and a state of mind.

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