

# Application of UG Software in Mechanical Design

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**Abstract:** UG software is powerful, and has been widely applied in machine design. The following is an analysis of the development of UG software. It also analyzes the characteristics of use and analyzes the specific application, hoping to give some references to the people concerned.

**Keywords:** UG software; Mechanical design; Practical application

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## 1. Introduction

The basic CAD module in UG, including the creation, storage, open file manipulation; view operation, including zoom, blanking, coloring; in addition, the single also includes other functions, such as curvature analysis, query expressions, plotter queue management, layer management, analysis of surface fairing Macro, automatic macro command records, users can quickly access the common functions, or two times the development of function.

Parameterized software UG is a three-dimensional integrated function is very powerful, for example, can carry on the design of computer aided engineering, computer aided manufacturing can be carried out, can also be related to the design, the main focus of CAD, CAM, CAE and other software, and its current design software compared to UG is the most advanced analysis manufacturing software, can build different shapes, also can be a variety of complex entities to construct. UG obvious advantages, so

a number of designers of all ages in the practical application, developers continue to gather feedback in practice, using some advanced technology, UG The version has been upgraded, the actual application performance has been greatly improved, the relevant function has also been improved, can fully meet the design requirements of modern mechanical enterprise, on the basis of this, in mechanical manufacturing, mechanical design has been widely used, the specific form is not complex, including the module of computer aided engineering, computer aided manufacturing module computer aided design module, etc., has been completely adapt to and meet the needs of mechanical design.<sup>[1]</sup>

## 2. Analyze the Practical Features of the Application of UG Software

UG software is an interactive environment, to ensure the work efficiency of the designers, for all its interface, can be combined with personal preferences set, combined with the actual needs, design a high quality scalable tools,

high-quality information and information window, window friendly design, right-click menu, convenient operation, can quickly access to commonly used commands. The design of dynamic interactive operation, convenient operation, direct manipulation of objects in the window, the workflow interaction operation, can effectively reduce the number of mouse, ensure the work efficiency. For intelligent operation, can quickly select Operation to avoid the waste of time and ensure the efficiency of work.

### 3. Analysis of the Application of UG Software in Mechanical Design

#### 3.1 Analysis of the Application of UG software in the Modeling of Parts

Use the UG design software, its advantage is very obvious, can be combined with the characteristics of different parts, parts selection of different design methods, this design is not only convenient, but also easy to learn, in the different toolbar also contains different commands, designers can according to the actual requirements, select the most suitable design method, can quickly complete the design of different parts. On this basis, UG software using the method of parametric design, the design has some relevance between different toolbar commands to modify the design, components, with convenient and reliable advantages. The change in parts design module, you can choose to automatically. As can be rapid response to the assembly drawings, correlation module and fast response. In the assembly model and engineering drawings of parts, modifications can be a direct reaction to the change in part for, do not need to use two-dimensional CAD diagram to modify the parts, do not have to make changes in the assembly drawing, so prone to low error, change or leakage problems. Using the UG software designers can take the work focus to structure design, is convenient for modification and design, designers can design parts of the structure.<sup>[2]</sup>

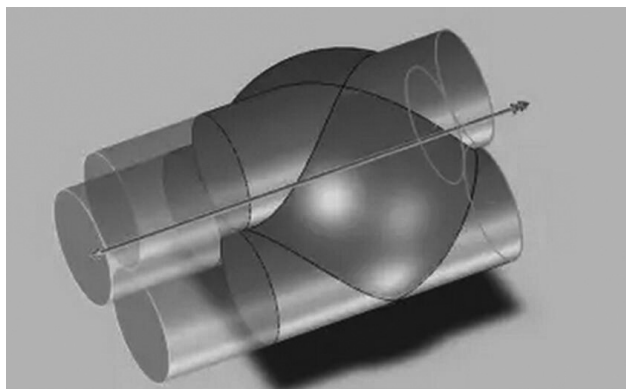


Figure 1. Part modeling

#### 3.2 Analysis of the Application of CAE Module

The CAE module belongs to the utility of a highly integrated, can make parts of finite element pre post in a very short period of time, this module focuses on the finite element analysis in the design, products with high quality can be obtained through optimization, at the same time does not affect the product quality, reduce product development time. CAE module can turn into the specific geometric model for all tools in the theory of finite element analysis model, not only can effectively complete the network division, also to carry out the basic definition, this module completes the processing before the post, the concrete results of finite element analysis of finite element for transmission to As the core of the solver, after calculation so as to complete the calculation, this module can be calculated by the form of animation, the output in different ways, such as contour map, image, on this basis can also implement dynamic simulation.

#### 3.3 Analysis of the Application of CAM Module

For the CAM module, can provide a multi function processing module with Motif environment as a basis, this module can meet different user observation requirements under certain conditions, more specific observation content, such as graphic change, graphics editing, tool movement, on the basis of this, this module also includes a variety of processing the design task procedures, operating procedures, types of tasks including tapping, drilling, the specific needs of users can combine the single user dialog box, modify it, or for some special menu, the operating module support, user function has been significantly enhanced, besides Besides, the operation module also has the characteristics of individuation, which is helpful for different users to build specific operations, such as parts finishing, rough parts processing, etc. these operations can be standardized gradually in practice.

#### 3.4 Analyze the Motion Mechanism of UG

The UG module provides the motion mechanism design and analysis of mechanism, can also be used for simulation, document generation, but in the UG model, or the definition of agency in the assembly environment, mainly has the initial conditions of motion, damping, spring, hinge, definition of mechanism elements, for the definition of good institutions can direct analysis in the platform of UG, can also be used for the study of different aspects, including trajectory envelope, minimum distance, interference check, can realize the simulation of the mechanism movement. Users can carry out the acceleration curve in this platform, analysis of reaction force, the graphic

method of speed, displacement and so on. For the reaction In terms of force, we can input finite element analysis. On this basis, we can build a comprehensive mechanism movement connection element library, achieve seamless connection between UG and MDI, and pass the results to MDI directly.

### 3.5 Analysis of the Application of UG in Cartography

Cartographers, engineers can make the entity model, drawing engineering drawing, using Unigraphics composite modeling technology, the construction of the geometric model and the size of the model in the process of change, the image will be updated in a timely manner, reduce the update time, improve the working speed. For the view, including cross section view, Hidden line view, modify the model will automatically update the automatic layout of views can provide a quick map layout, mainly involves the detail view, auxiliary views, sectional view, orthogonal projection view. UG support in the drawing standard main industry, such as ANSI, ISO, DIN, JIS in the build graph, its main component is a complete graph creation, annotation tools. Use UG to create the assembly information, can effectively construct the assembly, such as the timely establishment of the assembly decomposition view ability, can make a single sheet or a single pieces of the details of the assembly and component drawings the use of UG mapping, short time, low processing cost. For the UG engineering drawing module, provides a partial view, anisotropic view, section view, automatic layout view, automatic view layout tools, so designed to meet the application needs.<sup>[3]</sup>

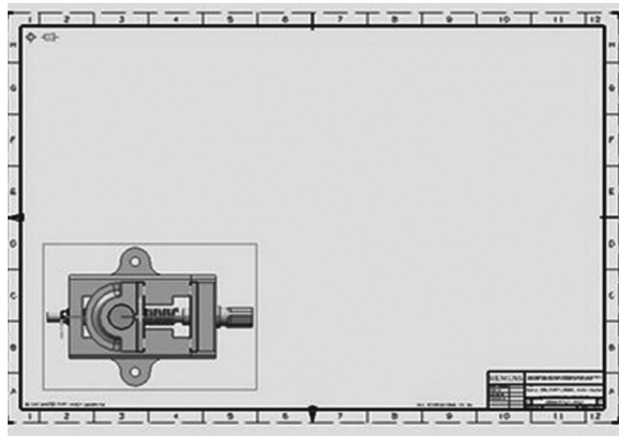


Figure 2. UG drawing

### 3.6 Analysis of the Application of UG in Assembly

UG in the design of the assembly module design pro-

fessional, has assembled a top down method, there is a bottom-up method. The method of assembly from bottom to top, according to the different parts of the good design, according to the requirements in the assembly with the pattern parts in the position directly before the assembly, design the designer has a clear design ideas, and positioning parts, connection point, structure, size has been determined. The designer can design the good parts into the assembly module, and add the coordination relationship effectively, guarantee the correctness of the location of parts in the assembly model for the design. Personnel for example, according to their own design intent, according to the location relationship of parts in assembly drawing, according to the characteristics of parts, we constantly adjust their design models to achieve the actual matching requirements, so that the structural design of parts will be more reasonable and achieve the final design function.

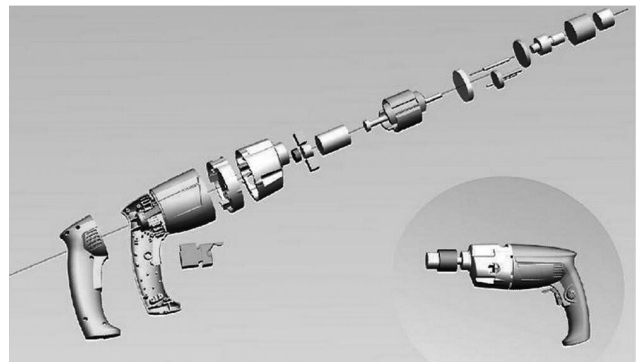


Figure 3. UG assembly

## 4. Conclusion

Through the analysis of the application of UG software in mechanical design, it is found that its operation speed is fast, compared with other methods, cost saving, design quality and assembly quality are high, and there will be a new development in the future.

## References

- [1] Dengke Zhou. The auxiliary application of UG software in the teaching of mechanical drawing[J]. Journal of Harbin Vocational and Technical College, 2016(2):51-53. (in Chinese)
- [2] Nan Li. UG software in the mechanical design of the application and research[J]. China Equipment Engineering, 2016(11):130-130. (in Chinese)
- [3] Nihua Zheng. On the application of 3D modeling software in mechanical design -UG to the strength design of parts[J]. Chinese Machinery, 2014(13):237-238. (in Chinese)