# The Application of Computer Simulation technology in Three Dimensional Effect of Group Calisthenics Design

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**Abstract.** This paper point out the current development situation and the main problems exists of group gymnastics in China and solve these problems in group calisthenics by using modern computer technology such as 3DS MAX, poser, Photoshop and other image software. This paper is divided into three parts. The first section briefly describes the current situation of gymnastics development in China. The second section focuses on static scene of group calisthenics design. Based on above content, the last part discusses the application of computer technology in group gymnastics. This paper aims to enrich and improve group calisthenics design level and provide the technology support for the future development of group calisthenics.

## Introduction

With China's rapidly improvement levels, our country's group calisthenics ability has achieved great development. But there still exists some shortcomings; especially group calisthenics design is seriously constricted by traditional ideas. Therefore, during group calisthenics design we should use modern advanced computer technology effectively; improve the deficiencies during group calisthenics design process. Taking full advantage of using three dimensional effects during the process of group calisthenics design can modify and improve the designs plan on computer, ensure the scientific and effectiveness of calisthenics design.

### The design idea toward group calisthenics static scene

The idea of design is suit for different sizes, different types group calisthenics. Using computer image software as the auxiliary tools during training can achieve the goal that reproduce gymnastics static scene on computer screen. The group calisthenics' design not only need to follow the traditional design ideas, while need to combine with image software's function and features: the first step, refine gymnastics constitute factors which can be rendered on screen static factors; the second step, sorting static factors according to the order; the third step, classify static factors according to the features of two and three dimensional image software's function; the last step, select the appropriate image software as the tool. The idea of using graphics software to design games is based on the traditional idea of design in group calisthenics. It is a kind of new development and enrichment. The relationship between them is shown in table 1.

Table.1 the concrete steps by using graphics software to design

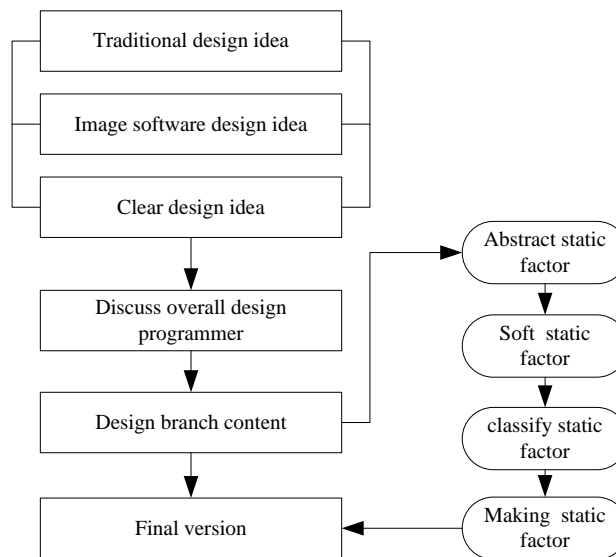| Extract | Sort | Classify | | Software Performing |
| | | two-dimensional factor | Three-dimensional factor | |
| --- | --- | --- | --- | --- |
| The components factor related to arena | Performance space | | + | 3DS MAX R3.0 |
| | Acting background | + | + | 3DS MAX R3.0 |
| | Performance stages | + | + | 3DS MAX R3.0 |
| | Scene lighting | | + | 3DS MAX R3.0 |
| | Scene effects | | + | 3DS MAX R3.0 |
| The components factor related to performer | Props | | + | 3DS MAX R3.0 |
| | Characters | + | + | 3DS MAX R3.0,Poser 4 |
| | Clothing | + | + | Poser 4 |
| | Action | | + | Poser 4 |
| | Formation patterns | | + | Poser 4 |
| | Location | | + | 3DS MAX R3.0,Poser 4 |



Fig. 1 The relationship between traditional group calisthenics design ideas and using image soft

## The application of simulation technique in three dimensional effects of group calisthenics design

Large-scale group calisthenics performance is a macro-evolution, so each element of the field, single individual can be instead by simple spheres or cylinders to minimize the complexity, thereby reducing the utilization of system resource. In order to describe the movement of each individual element, each individual should be ordered so as to determine the position each of them after moving. Each spot is streamed into graphic by automatically moving program, change process is

clear. Everyone just pay attention to its trajectory can able to clearly define their path. They should do is that put the constitute elements formation ready after processing as animation of starting frame, then open animation function of 3DS MAX. We should also select the proper key frame, the next work is same with the above, change constitute elements of location. Animation process only records that the location from start to end, adjustment process does not be recorded. You can arbitrary change constitute elements of location so that they coincide with the formation, in the course of this process, should follow the principles of proximity. Changes between the different formations in the gymnastics can be repeated.

**The application of simulation technology in static scenes**

During group calisthenics design, designers must study all kinds of image software on your computer carefully and need to consult the associated computer professionals, combine all kind of components of gymnastics effectively. Based on learning and researching variety of computers image software, take the three-dimensional image maker software 3DS MAX R3 Poser 4 and Photoshop5.0 and two-dimensional image software as your primary tool, according to the idea of using image software as the aid of design group calisthenics. When begin to design, pick out the main design tools, including 3D5MAkR, Poser4 and Photoshop5.0, three main software design group calisthenics can analyze constitute elements of performance venues and performers' components. The element of performance venues mainly includes: venue space, background, stage, lighting, and special effects; performers form factors mainly including: individuals, costumes, props, location, action, formation and pattern.

During computer technology design, the mainly function of 3D5 MAK software including: modeling, editing materials, texturing features, connectivity, light manufacturing and environmental settings and so on. In group calisthenics design, use of 3D5 MAK functions effectively can able to design beautiful gymnastics style, exquisite gymnastics scene. In addition, with 3D5 MAK can also reproduce two-dimensional graphic design effects in group calisthenics so that the location and layout of gymnastics can be determined effectively, convenient for train coaches and gymnastics officials. In human body design, you can use Poser animation tool, three dimensional graphics and animation build up the gymnastics effectively, facilitate to the placement of the posture. Poser software contains many factors such as human faces, hair design, designers can take full advantage of the related tools and parameters, so as to design gymnastic movements and clothing of personnel effectively, create realism effect for the gymnastics.

Two-dimensional software can design and synthase gymnastics' formations and patterns effectively, making the group calisthenics design seems more complete. In China, the group calisthenics gymnastics design is an important part of all design work, has a great influence on the development of group gymnastics. In the process of group calisthenics design, designers need to learn gymnastics carefully, make survey, analysis the ideas, form, content, and emotion expressed from gymnastics effectively.

When you design gymnastics, use computer imaging software accessibility, display the three dimensional effects on computer, reproduce the static scenes of group calisthenics, to a certain extent, improve the level of group calisthenics design. First of all, present games on the screen in static scenes, refine the elements effectively; thereby render the most crucial factors on the screen. Secondly, sort the static factors effectively according to the order; in addition, when classify the static factors in group calisthenics take advantage of features of two and three dimensional imaging software. Finally, in group calisthenics design, choose suitable computer imaging software as the tools for making static factors. You can enrich the ideas when design group calisthenics.

**Conclusion**

Based on computer technology, 3DSMAkR3.0, Poser4, three-dimensional image software and two-dimensional imaging software such as Photoshop5.0 can be used as a primary tool for group calisthenics design, main ideas of group calisthenics design fully shown with image software. There

are many excellent software and many other functions in computer technology, when using computer technology design group calisthenics, the first to do is that design a scientific and effective design solutions, so as to provide effective preconditions for group calisthenics design.

After decade's development, our country's group calisthenics have grown from the original simple exercises into a set of sound, light, color, and other high-tech means of collective performance, artistic and ornamental value is increasing. Components are also showing a rapidly growing trend. Traditional design is difficult to adapt to the needs of development of modern gymnastics, so computer technology of three-dimensional design is innovative based on original research and meets the requirements of games development.

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