

USING AUTOMATED SOFTWARE (OPTITEX, AUTOCAD AND OTHERS) IN THE DESIGN OF GARMENTS

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Abstract: This article provides a detailed analysis of the use of automated software in garment design. The specific features, capabilities, and applications of Computer-Aided Design (CAD) systems in the educational process are discussed. In particular, the processes of pattern making, modeling, fabric consumption calculation, and 3D visualization using programs such as Optitex, AutoCAD, and Gerber Technology are analyzed. Furthermore, the article highlights the role of these programs in improving the quality of education, developing students' professional skills, and ensuring production efficiency.

Keywords: computer-aided design systems, Optitex, AutoCAD, Gerber, modeling, 3D visualization, garments, CAD software, technology education.

Introduction

In the light industry and fashion sector, creating competitive products is becoming increasingly difficult without modern software tools. The process of designing garments is complex, and traditional methods require a great deal of time and manual effort. Today, Computer-Aided Design (CAD) systems help simplify and optimize this process.

Software such as Optitex, AutoCAD, Gerber Technology, Assyst, and Lectra enables designers to perform all stages of the design process—from pattern drafting to 3D visualization—much faster and more accurately. These programs are important not only in production but also in teaching technology-related subjects.

Main Part

1. General Features of Computer-Aided Design Software

The main functions of CAD systems include:

- creating patterns and constructing design elements;
- calculating fabric consumption and performing efficient marker making;
- modeling and grading by size;
- generating 2D and 3D representations of the project;
- producing a visual image of the finished product and performing virtual fitting.

Common Features of CAD Systems

1. Accuracy and speed

CAD systems provide higher precision than traditional hand-drawing methods and significantly increase work efficiency.

2. Visualization capabilities

They allow designers to create a virtual 3D model of the garment, making it possible to evaluate the product before production.

3. Flexibility

A single design can be saved in various formats, edited easily, and integrated with other software.

4. Optimization

Efficient marker making reduces fabric waste and increases economic effectiveness.

5. Integration opportunities

CAD systems can be linked with CAM (Computer-Aided Manufacturing) tools for automated production.

6. Error reduction

These systems help identify technical issues before the garment reaches the production stage.

Compared to traditional manual drafting, these processes are more efficient and almost error-free.

2. Optitex Software

Optitex is one of the most widely used programs for garment design and modeling.

Its advantages include:

- creating 2D patterns and automatic size grading;
- optimizing fabric layout (nesting) to reduce waste;
- 3D modeling that shows how a garment fits on the human body;
- detecting potential technical errors before production.

Key Features**1. 2D Design and Pattern Making**

- Precise drafting of garment components and full pattern creation.
- Automatic grading into different sizes (small, medium, large).
- Saving and printing patterns in standard formats.

2. 3D Modeling and Visualization

- Virtual try-on for garment fitting.
- Realistic display of fabric textures, colors, and prints.
- Previewing garment behavior on the human body.

3. Fabric Consumption Calculation (Nesting)

- Optimal arrangement of pattern pieces to minimize waste.
- Accurate material consumption reports for production efficiency.

4. Detection of Technological Errors

- Identifies potential issues in the sewing process.
- Shows tight or loose areas visually.

5. Flexibility and Integration

- Compatible with AutoCAD, Illustrator, and other software.
- Connects with industrial equipment such as plotters, laser cutters, and printers.

Use in education:

Virtual modeling helps students experiment with designs, develop creative thinking, and increase engagement in practical lessons.

3. AutoCAD Software

AutoCAD is a universal drafting and design tool widely used across various industries, including light industry.

Advantages:

- creating precise technical drawings;
- saving and sharing files in standard formats;
- analyzing model geometry;
- integrating with other software.

Use in garment design:

AutoCAD is helpful in developing technical drawings, constructing complex garment elements, and analyzing geometric accuracy.

Main Capabilities**1. 2D Drawing**

- Drafting technical drawings, patterns, and constructions.
- Adding dimensions, notes, and symbols.

2. 3D Modeling

- Creating three-dimensional models.
- Realistic visualization and animation.

3. Flexibility

- Saving in DXF, DWG, PDF, and other formats.
- Integration with software used in different industries.

4. Analytical Tools

- Accurate measurement calculations.
- Geometric and technological evaluation of the project.

5. Libraries and Templates

- Use of pre-designed elements and components.

4. Other CAD Systems

- **Gerber Technology** – widely used for pattern drafting, marker making, and grading.
- **Lectra** – designed for large-scale industrial projects.
- **Assyst** – a German system specialized in automated garment construction.

These programs, along with Optitex and AutoCAD, can be effectively used in modern educational processes.

Importance of CAD in Education

The role of AutoCAD in teaching technology subjects:

Using AutoCAD in vocational and technical education helps students:

- improve graphic literacy;
- develop construction and design skills;
- strengthen engineering thinking;
- acquire professional competencies needed in the modern labor market.

5. AutoCAD in Garment Design

Though AutoCAD is mainly used in engineering and construction, it is also applicable in the garment industry for:

- creating technical drawings of garment parts;
- modeling complex constructions;
- geometric analysis of components;
- integrating with specialized software such as Optitex and Gerber.

AutoCAD Versions and Their Capabilities

- **AutoCAD LT** – a lightweight version designed only for 2D drafting.
- **AutoCAD Architecture** – specialized for architectural design.
- **AutoCAD Mechanical** – for mechanical engineering.
- **AutoCAD Electrical** – for creating electrical schematics.
- **AutoCAD Civil 3D** – for civil engineering and road construction.

Benefits of Using Automated Software in Teaching Technology

- developing students' professional skills;
- encouraging independent work and creative approaches;
- preparing learners for modern digital professions;
- enabling students to work on practical projects;
- training specialists who meet labor market demands.

Conclusion

Using automated software in garment design is a key factor in advancing the light industry. Programs such as Optitex, AutoCAD, Gerber, and Lectra make design processes faster, more accurate, and economically efficient.

Integrating these tools into technology education enhances student preparedness, fosters

creative thinking, and equips them with essential skills for successful careers in a competitive market.

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