Уважаеми читатели,

Втори брой на онлайн списание за ТЕКСТИЛ, ОБЛЕКЛО, КОЖИ И ТЕХНОЛОГИИ е на ваше разположение онлайн-ЗЕЛЕН, защото се присъединяваме към опазване на околната среда от текстилни и кожени продукти, **ПЪСТРОЦВЕТЕН** с научни разработки за облеклото, **НЕЖЕН** от историята за бельото на Триумф, **ДИНАМИЧЕН** с новите регламенти за стандарти, **ИННОВАТИВЕН** с нови интелигентни решения за текстилната индустрия в днешния глобално променящ се свят от нашата страна.

Пожелаваме ви вдъхновение и бъдете с нас онлайн!

Редакционен екип
СЪДЪРЖАНИЕ & CONTENS

ОЦЕНКА И ХАРМОНИЗАЦИЯ НИВОТО НА ОБЛЕКЛОТО
Светлана Кулешова, Алла Славинска, Оксана Закхарчевич, Галина Швец.................................3
EVALUATING THE LEVEL OF CLOTHES HARMONISATION
Svetlana Kuleshova, Alla Slavinska, Oksana Zakhirkevich, Galina Shvets.................................3

АНАЛИЗ НА СЪЩЕСТВУВАЩИТЕ МЕТОДИ ЗА МОДЕЛИРАНЕ НА ДЪЖД ПРИ ИЗПИТВАНЕ НА ОБЛЕКЛО
Даниел Ангелов..................................................................................................................................11
ANALYSIS OF EXISTING RAIN MODELING METHODS FOR CLOTHING TESTING
Daniel Angelov..........................................................................................................................................11

Триумф-История на бельото..................................................................................................................16
Triumph's History through the Evolution of lingerie.............................................................................16

Global Organic Textile Standard с нова версия 5.0 – критерии и актуализации............................28
Global Organic Textile Standard with new version 5.0 - criterion and Updates.................................28

STANDARD 100 от OEKO-TEX®...........................................................................................................29
STANDARD100 by OEKO-TEX®................................................................................................................29

Конкурс „Разработване на проекти по наука, техника и технологии“
в ПГМЕТ „Ген. Иван Бъчваров“.......................................................................................................30
Contest "Development of Projects in science, Technology and Technology"
in PGMET "Gen. Ivan Bachvarov"..................................................................................................30

БЕЗ СТЪПКИ НАЗАД - ТРИ НАПРЕД!
"Ателие Nevy & DiL" ................................................................................................................................31

Фирма ГАБИК ЕООД - РУСЕ..................................................................................................................32
GABIK LTD - Ruse................................................................................................................................32

Нов интелигентен продукт от Аглика ООД.........................................................................................33
New Intelligent Product from Aglika LTD............................................................................................33

За контакти: spisanie@tok-bg.org, redaktor@tok-bg.org, office@tok-bg.org

Редакторски съвет:
Проф. Елсайед Елнашар, Египет
проф. д-р инж. Йован Степанович, Сърбия
проф. д-р инж. Горан Дембоски, Македония
dоц. д-р инж. Душан Трайкович, Сърбия
dоц. д-р инж. Ненад Чиркович, Сърбия
gл.ас. д-р инж. Соня Въчинска, България
d-р инж. Даниел Ангелов, България
инж. Наташа Сивевска, Македония

Графичен дизайн Стефка Нейкова

online magazine for Textile, Clothing, Leather and Technology
Abstract:

Aesthetic garment quality is one of the most important problems of the apparel design. Fashion designer has a need in some numerical methods to evaluate the level of harmonization in order to reveal the weaknesses in the garment design. Method of complex assessment of aesthetic quality in clothes design is based on the calculation of the weighting factors of unit indexes of aesthetic quality. Compiled list of indexes which characterise aesthetic garment quality is represented in the table form. The weighting factors of the indexes were calculated. Sequence of actions for the evaluation the level of harmonization is presented with examples of women’s outfits.

1. Introduction

Nowadays the life cycle of fashion items are shortened and the items are being replaced within a very short period to fulfill consumers’ needs. Consumer needs can be met by determining their functional, expressive and aesthetic requirements. Aesthetic garment quality is one of the most important problems of the apparel design in Ukraine. This is complex problem because it is related to all stages of the design process. Aesthetic quality is usually achieved as a result of harmonization an outfit’s colors, shapes, fabrics and proportions. To harmonize means to bring things into harmony, or to make things compatible. However, the ability to harmonize an outfit’s features is depended on designer personality. Some professionals have a natural eye for it, having a so-called “sense of style.” This is not the same as “fashion sense” – knowing what is in vogue – but a feel for line and design. The lack of dress-sense could make the garment uncompetitive, though the garment fitting is perfect. Thus all kinds of garments must have enough aesthetic quality level. All kinds of garments must have enough aesthetic quality level.

The problem of the quantities evaluation of the beauty can be traced back to the work [1] where the formula of the calculation of the beauty level was described. Then works [6, 12, 13] can be considered as a base for the actual research of the aesthetic garment quality. In the paper [6] characteristics of the aesthetic garment quality were described. In the work [13] it was proposed to use the etalon garment samples to evaluate these characteristics. Slavinska [14] proposes a list of criterions for the evaluation of information arrays in apparel design process.

According to recommendations [6, 13, 14] indexes list of the aesthetic garment quality was compiled by Kuleshova in [8]. The method of improving of the artistic perfection of dress was developed in [9]. The method is based on the systematization of compositional elements for making a harmonious shape of dress. This work was extended in [10], and the method of early diagnostic of the aesthetic garment quality was developed.

2. Methods

Calculated weighting factors of the indexes are represented in the table 1.

The weight of indexes would be used for a calculation the level of clothes harmonisation.
Table 1. Weighting assignments for the indexes of the clothing harmonisation

<table>
<thead>
<tr>
<th>№</th>
<th>Group index</th>
<th>Subgroup index</th>
<th>Weight</th>
<th>Index notation</th>
<th>Index</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Proportion</td>
<td>$K_{pc}$</td>
<td>0.318</td>
<td>$K_{pc}$</td>
<td>0.107</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Color scheme of the garment style</td>
<td>$K_{col}$</td>
<td>0.315</td>
<td>$K_{col}$</td>
<td>0.110</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Fitting of garment</td>
<td>$K_{fit}$</td>
<td>0.196</td>
<td>$K_{fit}$</td>
<td>0.196</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Scale</td>
<td>$K_{sc}$</td>
<td>0.171</td>
<td>$K_{sc}$</td>
<td>0.112</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Assigned weightings total: 1.000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The developed method of the evaluation the level of clothes harmonisation must be performed according to the sequence of actions that is follow:

1. The first step of the method is a consumer’s appearance identification.
2. Geometric silhouette of garment must be chosen from the catalogs of fashionable geometric shapes of clothing silhouettes. Then a designer makes a decision if the chosen shape of the garment is to be adapted. The shape could be altered if the individual figure and its harmonized prototype are almost the same. Otherwise, it would be better to design the desired shape of the garment according to the consumer’s appearance.
3. Art and design parameters for the garment must be chosen from the matrix that includes preferred parameters of dresses for fashionable figures on the next step of the method. Adaptation of the chosen parameters is to be done only if they are entirely different from the real ones.
4. Then a designer puts a consumer’s photo and a sketch of desired dress into the grid of harmonic segmentations that was specifically developed by authors. After that the design parameters of the dress must be altered according to the grid limits.
5. An adequate choice of clothes color palette for the person’s coloring is the next step of the method.
6. Finally, computing of the indexes of clothes harmonisation by the formulas that are shown in the table 2 finishes the process of evaluation.

Table 2. Sequence of the evaluation the level of clothes harmonisation

<table>
<thead>
<tr>
<th>№</th>
<th>Index</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Proportion</td>
<td>$K^P = K_{pc} G^P_1 + K_{pc} G^P_2 + K_{pc} G^P_3$</td>
</tr>
<tr>
<td>1.1</td>
<td>Ratio of the garment size to a consumer height</td>
<td>$K^P_{pc} = D_{gar} / H$</td>
</tr>
<tr>
<td>2</td>
<td>Color scheme of the garment style</td>
<td>$K_{col} = K_{col, t} G_{col, t} + K_{col, h} G_{col, h} + K_{col, us} G_{col, us} + K_{col, con} G_{col, con}$</td>
</tr>
<tr>
<td>3</td>
<td>Fitting of garment</td>
<td>$K^S = K^S_1 G^S_1 + K^S_2 G^S_2$</td>
</tr>
<tr>
<td>4</td>
<td>Scale</td>
<td>$K^S_{fit} = S_{gar} / S_{body}$</td>
</tr>
<tr>
<td>4.1</td>
<td>Concordance of the garment size and human body size</td>
<td>$K^S_{fit} = S_{part} / S_{gar}$</td>
</tr>
<tr>
<td>4.2</td>
<td>Concordance of the whole garment size and the size of its parts</td>
<td>$K^S_{fit} = S_{part} / S_{gar}$</td>
</tr>
<tr>
<td></td>
<td>The level of harmonisation of clothes</td>
<td>$K^S_{fit} = S_{part} / S_{gar}$</td>
</tr>
<tr>
<td></td>
<td>Assigned weightings total: 1.000</td>
<td></td>
</tr>
</tbody>
</table>
In the table 2:

\[ D_{\text{gar}} \] – length of garment, cm;
\[ H \] – consumer’s height, cm;
\[ K_{2}^{pr} \] – proportional allocation of the constructions lines;
\[ K_{3}^{pr} \] – proportion of the size and allocation of the garment parts;
\[ K_{\text{col.f.t}} \] – concordance the colors to the fashion trends;
\[ K_{\text{col.h}} \] – harmony of the materials colors;
\[ K_{\text{col.us}} \] – concordance the colors and usage circumstances;
\[ K_{\text{col.con}} \] – concordance of the colors and consumer’s appearance;
\[ S_{\text{gar}} \] – surface area of garment, cm²;
\[ S_{\text{body}} \] – area of a human figure projection with clothes on it, cm²;
\[ S_{\text{port}} \] – total surface area of decorative parts of the garment, cm²;
\[ K^{j} \] – value of harmony index \( j \);
\[ G_{j} \] – weighting factor of index \( j \);
\( n \) – a number of the indexes.

In order to perform the analysis of standard and real figures of the consumers they were divided into three groups: harmonious figures and ideal figures; harmonized figures that are not significantly different from the ideal ones, and require only the adaptation of the fashionable garments; inharmonious figures that require a special development of the clothes designs. A harmony group of individual figure can be computed with the method that was described in the work [11]. Besides that, the way of garment alteration can be determined by this method. A standard figure (height – 170 cm; bust – 92 cm; hips – 100 cm) was tested by the method that was described in the work [14], and a ratio of the body sizes of standard and harmonious figures was considered as the figure type “S-S-M” that means “Small – Small – Medium”.

3.2. Geometric silhouette and design parameters for the garment

As a result of the individual consumer’s appearance identification the design modifications of women dresses were proposed and presented in the table 3.

3.3. Choosing the geometric silhouette of the garment

Fashion mega portal «first VIEW» [17] was used to carry out current study. This portal allows working with digital photos of the collection shows. Modern European women’s dresses (seasons “spring-summer” 2016) were selected as an object for the study. Six Fashion Houses were selected for the research: Alexander McQueen (UK), Chanel (France), Dior (France), Valentino (Italy), Gucci (Italy), Slava Zaitsev (Russia). The Fashion Houses meet the following criteria:

- the history of the House has over ten years;
- the Fashion House is famous, and it could be claimed as a “trendsetter”.

At the first stage of current research, over 250 images (about 50 models in each collection) were analyzed and presented graphically as the geometric symbols (GS). Models were located in a united modular grid in the full
growth. The symmetry of the human figure was taken into account, but specific characteristics of dress shape (a color, sewing lines, decorative details, fabrics properties, etc.) have been ignored. It allowed tracing the process of forming a dress shape by allocating the main feature of the dress (figure 1).

Quantitative analysis of the evolution of dresses shapes means that the percentage of each tendency in collections of the current year or season is to be determined. Quanitative analysis is represented in the table 4.

Geometric symbols of basic and derivative shapes of the costume could be used as the input data for the apparel design. The main basic shape in the current period is the X-shaped dress (BSh2). This shape is presented on the female figure (fig. 2) as a complex model, which includes contours of the garments. Each garment has a certain type with the correspondent shape.

Figure 1. Examples of the graphical analysis of visual projection structure of the dresses

Table 4 – Statistical analysis of the geometric symbols of modern European women’s dress shape (2016)

<table>
<thead>
<tr>
<th>№</th>
<th>Fashion House</th>
<th>Percentage of dresses with the basic shape (BSh), %</th>
<th></th>
<th>Percentage of dresses with the derivative shape (DSh), %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>BSh1</td>
<td>BSh2</td>
<td>BSh3</td>
</tr>
<tr>
<td>1</td>
<td>Alexander McQueen</td>
<td>32</td>
<td>8.0</td>
<td>15.0</td>
</tr>
<tr>
<td>2</td>
<td>Chanel</td>
<td>47</td>
<td>18.1</td>
<td>11.3</td>
</tr>
<tr>
<td>3</td>
<td>Dior</td>
<td>35</td>
<td>6.8</td>
<td>11.0</td>
</tr>
<tr>
<td>4</td>
<td>Valentino</td>
<td>49</td>
<td>15.2</td>
<td>20.7</td>
</tr>
<tr>
<td>5</td>
<td>Gucci</td>
<td>37</td>
<td>12.0</td>
<td>5.6</td>
</tr>
<tr>
<td>6</td>
<td>Slava Zaitsev</td>
<td>51</td>
<td>14.9</td>
<td>17.3</td>
</tr>
</tbody>
</table>

Table 4 – Statistical analysis of the geometric symbols of modern European women’s dress shape (2016)

Figure 2. Geometrical images of the dominant shape: a) shape 1; b) shape 2; c) shape 3
At the next step of the research the photos of specific dresses (models from 1 to 6) were placed on consumer’s photo (figure 3).

### 3.4. Harmonization of the garment

The harmonization of the garment must be performed in accordance to the following order. The consumer’s photo and the sketch of the dress are to be placed into the grid of harmonic segmentations as it shown on the figure 4.

After that, the design parameters of the dress must be altered according to the grid limits. Foremost it is necessary to begin with alteration of the garment length. Then the width parameters must be changed: the shoulders line as well as the hem line. These alterations are shown on the figure 5. The degree of fit at the waistline could also be adjusted. Finally, a designer changes the form of neckline, and the specifics of decorative parts.

In the table 4 it could be traced the difference between the harmonized and the fashionable dress that was presented in the fashion magazine (online catalog, fashion portal, etc.).
Table 4 – Comparison of composition parameters

<table>
<thead>
<tr>
<th>Model</th>
<th>Fashionable dress</th>
<th>Harmonized dress</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><img src="image1" alt="Fashionable dress" /></td>
<td><img src="image2" alt="Harmonized dress" /></td>
</tr>
<tr>
<td>2</td>
<td><img src="image3" alt="Fashionable dress" /></td>
<td><img src="image4" alt="Harmonized dress" /></td>
</tr>
<tr>
<td>3</td>
<td><img src="image5" alt="Fashionable dress" /></td>
<td><img src="image6" alt="Harmonized dress" /></td>
</tr>
<tr>
<td>4</td>
<td><img src="image7" alt="Fashionable dress" /></td>
<td><img src="image8" alt="Harmonized dress" /></td>
</tr>
<tr>
<td>5</td>
<td><img src="image9" alt="Fashionable dress" /></td>
<td><img src="image10" alt="Harmonized dress" /></td>
</tr>
<tr>
<td>6</td>
<td><img src="image11" alt="Fashionable dress" /></td>
<td><img src="image12" alt="Harmonized dress" /></td>
</tr>
</tbody>
</table>
3.5. Selection of the clothes color palette

According to the recommendations for colors of the consumers' types [2, 4, 5, 15], the lists of the recommended colors for the “spring” consumer color type were compiled. The specifics of the color type are shown in the table 5, and in the table 6 there is the list of the recommended colors.

<table>
<thead>
<tr>
<th>Consumer type</th>
<th>Hair color</th>
<th>Skin color</th>
<th>Eye color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring</td>
<td>Golden brown</td>
<td>Golden beige</td>
<td>Gray</td>
</tr>
</tbody>
</table>

Table 5. Personal coloring for the consumer

<table>
<thead>
<tr>
<th>Consumer type</th>
<th>Color model</th>
<th>Recommended colors for the consumers' types, %</th>
<th>Recommended fashionable colors for the consumers' types, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring</td>
<td>C</td>
<td>0.264 0.259 0.268 0.257 0.257 0.274</td>
<td>0.264 0.259 0.268 0.257 0.257 0.274</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>0.315 0.245 0.245 0.245 0.260 0.285</td>
<td>0.315 0.245 0.245 0.245 0.260 0.285</td>
</tr>
<tr>
<td></td>
<td>Y</td>
<td>0.196 0.196 0.196 0.196 0.196 0.196</td>
<td>0.196 0.196 0.196 0.196 0.196 0.196</td>
</tr>
<tr>
<td></td>
<td>K</td>
<td>0.125 0.125 0.125 0.121 0.121 0.128</td>
<td>0.125 0.125 0.125 0.121 0.121 0.128</td>
</tr>
</tbody>
</table>

Table 6. Recommended colors for “spring” consumer type (monochrome harmony)

In the table 8 the CMYK color model was used according to the recommendations [3]: C – Cyan, M – Magenta, Y – Yellow, K – Black.

3.6. Evaluation of the level of clothes harmonization

On the final step of the method the values of the indexes are to be calculated (according to the table 2). The results of the calculations are shown in the table 7.

<table>
<thead>
<tr>
<th>Index</th>
<th>Value for model</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Proportion</td>
<td>0.264 0.259 0.268 0.257 0.257 0.274</td>
</tr>
<tr>
<td>2 Color scheme of garment style</td>
<td>0.315 0.245 0.245 0.245 0.260 0.285</td>
</tr>
<tr>
<td>3 Fitting of garment</td>
<td>0.196 0.196 0.196 0.196 0.196 0.196</td>
</tr>
<tr>
<td>4 Scale</td>
<td>0.125 0.125 0.125 0.121 0.121 0.128</td>
</tr>
<tr>
<td>Complex index</td>
<td>0.90 0.825 0.832 0.819 0.834 0.883</td>
</tr>
</tbody>
</table>

The outfit number 1 may not be altered anymore because the calculated value of the complex index of the clothes harmonization is high enough. Others dresses are advisable to alter.

4. CONCLUSION

The obtained information can be used as a basis for the formal methods for the evaluation the aesthetic garment quality. Besides that the results could be provided for the development of an expert system that would be intended for make a decision about the needs for the adjustments of a garment's appearance. The weighting factors that were obtained in the present work can be use for the evaluating of the harmonization level of any garment types.

5. ACKNOWLEDGMENT

The results shown in the paper were presented on International Conference on Research in Education and Science (ICRES), May 19-22, Bodrum, Turkey.
6. REFERENCES


За бъдещето на текстилните и кожените продукти, техните технологични решения и приложения, в ерата на дигитализация в световен мащаб СЛЕДЕТЕ нашата постоянна рубрика НОВИНИ на www.tok-bg.org