

BUILDING A DATABASE FOR FASHION STATEMENTS

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ABSTRACT

In fashion design, the designer has a message to communicate with the public. Such a message can be a statement of personal life style, political status, cultural identity, or carry other meanings. Collectively, such a statement is called the fashion statement, which is typically expressed in terms of a collection of design elements. In turn, these design elements interact with each others to form the final impression, whether visual or associative, to the public. In the current study, we set up questionnaires in order to collect fashion statements, their associated photos, and design elements from the public and a number of fashion experts. A database has been set up to the data related to fashion statements. In our future work, an intelligent searching engine will be built in this database in order to decompose fashion statements into design elements and predict fashion statements from specific design elements.

1. INTRODUCTION

In the digital age, many of the fashion designers have changed their working procedure from hand drawing to computer-aided-design (CAD) drawing. Although the quality of the computer generated images are inferior to the hand drawn images, the efficiency of the drawing process has overcome the barrier. For example, the Prima Vision™ System offers the feature of “color combos,” where all possible combinations of the colors of a garment can be generated within a fraction of a second (Figure 1.). Such a feature can significantly reduce the time and effort in searching of the right color combination.

Based on the same rationale, a fashion design CAD system should also be able to produce the feature of “design combos,” where all possible combinations of design elements of a fashion statement can be generated within a fraction of a second. In this article, we shall discuss the necessary theoretical framework, procedures and the associated infrastructure of such a proposed system. A short example is also included as a demonstration of how the system can be operated.



Fig. 1 Color Combos of Prima Vision Software

2. THEORETICAL FRAMEWORK

A fashion statement can be defined as an abstract message that is embedded in a physical garment. It is composed of a collection of abstract design elements. In turn, each abstract design element is associated with a collection of discrete design elements, which can be found on the physical garment. A fashion statement can be interpreted as if a text statement, as defined by Ng (2004) and Halliday (2003). The current working definition can be matched with the Barthe's (1983) definition in the following way:

Image clothing (visual representation)	<->	fashion statement
Written clothing (verbal representation)	<->	abstract design elements
Real clothing (technological representation)	<->	concrete design elements and the physical garment

Although Barthe started his study of the fashion semiotics system based on the description of the fashion in the fashion magazines, such as Vogue, his approach indeed searched for the meaning of a garment, i.e. a fashion statement, and the factors of the fashion trend. The verbal or written description of the image clothing is the special feature of the garment that can arouse associative memory of the population. In the fashion language, these special features are simply the abstract design elements. Finally, all the meanings and the special features are concretized as physical items on the garment, which is photographed and displayed in the magazine. Naturally, the physical items are concrete design elements on the physical garment.

Now, we can define the system and elaborate on the implementation details. The implementation can be divided into several phases. Firstly, a questionnaire was defined to capture the abstract and concrete design elements within a fashion statement. Then, this information was further studied to reveal the difficulties in the implementation.

3. FORMAL DEFINITION OF FRAMEWORK

In the current project, the following mathematical definitions are adopted.

$\langle \text{fashion statement} \rangle := \langle \text{abstract design elements} \rangle^*$
 $\langle \text{abstract design element} \rangle := \langle \text{concrete design elements} \rangle^*$
 $\langle \text{garment} \rangle := \langle \text{concrete design elements} \rangle^*$

These definitions are written in an abstract relational form. The * sign means that it is a collection or a combination of elements.

4. DATA COLLECTION

Following the approach of Barthe, a group of ten (10) photos were selected from the fashion magazine, Vogue and Elle, in their April and May 2005 issues. The selection procedure and selection criteria are as follow:

1. Search for the trends that were mentioned in the magazines;
2. Within each trend, group the photographs of the garments and select one representative from each group;
3. Compare the selected ten photos and check if they are similar in any way;
4. If there is any similar garment, one of them must be discarded and replaced by another one from the trend group;
5. Verify the verbal description of the trend and the garment is consistent with the garments in the photos.

When the photos were ready, the questions were designed. In the questionnaire, we need to check: (1) whether fashion designers agree with the editor on the fashion

statement; (2) whether fashion designers can identify or extract the same set of design element, both abstract and concrete, from the garment; (3) the personal rationalization of why the fashion designers like or dislike the garment in the photo. As an example, the questionnaire of one garment is listed in the Appendix. The questions were phrased as open-ended questions, so as to allow maximum flexibility of the responses. Furthermore, when the designers describe why they like or dislike the design, the order of the appearance of the design elements were ranked implicitly in the statistical analysis.

The questionnaire was launched in the summer of 2005 in Hong Kong, during the Fashion Week. A total of twenty responses was captured via personal interviews at the exhibition hall. The data was compiled.

5. FORMAL DEFINITION OF DATABASE STRUCTURE

After the collection of data, a database was designed and built to store the information. In commercial applications, relational database management system (RDBMS) is very popular. Examples are Excel, Access, DB2, etc. However, the relational database management system requires a very rigid and structural format of the data, which is sometimes difficult for our existing data set. Therefore, we have used the network database management system (NDBMS), which provides the maximal flexibility in the storing of the data and their pairwise relationships. The theory of the database structure is available in Riordan (2005).

In a network database environment, there is only one type of record, namely, the relationship record. It is a list with the header equals to the name of relationship, and the elements in the list are pairs of data, (x, y) , so that x is related to y according to the name of the relationship. For example a list of *Love*(*(Tom, Mary), (Mary, Jim)*) contains the facts that *Tom* loves *Mary* and *Mary* loves *Jim*.

Above the facts recording layer, there is the application layer, which is used to store the definitions of the fashion statements. As stated in section 2, the fashion statements are expressed in the form of production rules. Therefore, this application layer is organized to facilitate the following questions:

1. Search all the possible combination of the concrete design elements to form a fashion statement;
2. Select a list of design elements, search through all the related fashion statements.

An example of the fashion statement of the garment in the Appendix is defined below. The title of the fashion statement is “Heat Wave.” It has three abstract elements of (1) latin, (2) feminine, and (3) summer season. The corresponding concrete elements are (1) floral print with spicy colors, (2) skirt, lace trimming, and (3) sleeveless top and flared skirt. [Note: the symbol \cap means “and” in the definition.]

- Heat Wave := latin \cap feminine \cap summer
- Latin := spicy colours \cap floral print
- Feminine := skirt \cap lace trimming
- Summer := sleeveless top \cap flared skirt
- Spicy colours: = cyan \cap sunny yellow \cap brownish red

The production rules can be viewed as a tree structure, where the root of the tree is the fashion statement, and the branches are the concrete design elements which can be found on a garment (Figure 2.).

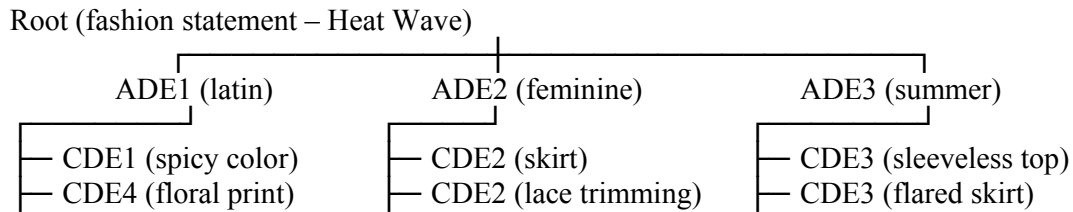


Figure 2. Tree Structure of Fashion Statement

6. IMPLEMENTATION

The prototype fashion statement system was implemented using Mathematica™ version 5.2 on a PowerPC Mac G4™ with 500 MHz CPU and 1 GByte of SDRAM. The network database management was implemented as a list structure. The production rules were implemented as a tree structure, represented as a multilevel list structure. The corresponding example is then:

```

fashionStatement = {
  {heatWave, {latin, feminine, summer}},
  (* and other statements *)}

abstractConcreteConversion = {
  {{latin, spicyColor}, {latin, floralPrint},
  {feminine, skirt}, {feminine, lace},
  {summer, sleeveless}, {summer, flaredSkirt},
  {spicyColor, {cyan, sunnyYellow, brownishRed}}},
  (* and other examples *)
  {feminine, pestalColor}, {feminine, softFabric},
  {summer, beachPrint}, {summer, yellow},
  {pure, white}, {pure, black},
  {simple, white}, {simple, plain}}

photo = {
  {heatWave, "heatwave.jpg"},
  (* and other photos *)}
  
```

There are two queries available. One of them is to display the structure of the fashion statement with the associated photography. Another one is to generate the all possible combinations of the concrete design elements. A sample result of the query of a fashion statement with summer and feminine will include the possible combinations of

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{{feminine, skirt}, {feminine, lace},
 {feminine, pestalColor}, {feminine, softFabric},
 {summer, sleeveless}, {summer, flaredSkirt},
 {summer, beachPrint}, {summer, yellow}}.
  
```

This will generate $2^4 * 2^4$, or 256 combinations. Of course, in the current implementation, the result is still text based. However, in the future, graphics results will be displayed. By then, additional restrictions must be used to reduce the number of drawings.

7. DIFFICULTIES AND LIMITATIONS

The proposed database system is a prototype system. During the development, many difficulties have been identified. Firstly, many of the adjectives are very fuzzy and not precise. For example, the name of color has much variation within the same photograph. Secondly, many of the adjectives are very abstract and not easy to be defined. For example, the word “arrogant” is defined as “Having or displaying a sense of overbearing self-worth or self-importance,” according to the American Heritage Dictionary (2006). The displacement of sense of self-importance is very abstract. Thirdly, many pairs of adjectives are difficult to be differentiated. For the word “chic” is defined as “Conforming to the current fashion; stylish: *chic clothes; a chic boutique*,” while “elegant” is defined as “tasteful opulence in form, decoration, or presentation.” This pair of words mean very differently from each other for the fashion designers. The fourth difficulty encountered is the interpretation of the design elements themselves. The interpretation of the “red” color depends on the cultural background and the timing of the design work. Hence, the cultural influence and the temporal influence are beyond the original consideration of the software. Yet, without these considerations, the interpretation of the fashion statement may not be consistent. Finally, the number of possibilities can be too large to be selected within a reasonable time. In the above example, two abstract design elements can generate 256 different combinations for the designers to choose. In reality, the number of combinations should be in the order of tens of thousands. Additional selection criteria must be used to restrict the number.

There are two main limitations of the current prototype system. On one hand, the output of the query result is still text based, which may not be very useful to the designer yet. If the query result is in photograph form, it is still possible to display the corresponding photographs in the database. They can serve as reference with an understanding that the photographs carry their own fashion statements. On the other hand, the generation of computer illustration based on the requirements of the concrete design elements will further increase the number of possibilities to infinity, which cannot be handled easily.

8. CONCLUSIONS

The joint research team of The Hong Kong Polytechnic University and ENSAIT has developed a prototype network database system, which contains the fashion statements with their related abstract and concrete design elements. A group of photographs of garments was selected from the Vogue and Elle magazine and were incorporated in a questionnaire for the fashion designers. The designers extracted the design elements from the garment and described their reasons for like or dislike of the garment. Through this information, the fashion statement was identified and the associations of the abstract and concrete elements were defined. The fashion statements were stored in a network database system, which provided the query ability of displaying the original structure of the fashion statement, and the query ability of generating all possible

combinations of the concrete design elements based on the required fashion statement.

In this article, the prototype database has been demonstrated. The system can achieve the functional requirement and help the fashion designers in shortening their design cycle by producing all the combinations for selection. The difficulties of a full-scaled implementation include: (1) vague definitions of the adjectives, (2) abstract definitions of the adjectives, (3) similarities of the adjectives, (4) cultural and temporal interpretations of the design elements, and (5) large number of combinations. In the next phase, these difficulties will be addressed.

9. REFERENCES

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TRADE MARKS

MathematicaTM is a trademark of Wolfram Research Inc.

Prima VisionTM System is a software available from the Lectra Ltd.

PowerPC MacTM is a trademark of Apple Computer Inc.

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APPENDIX SAMPLE QUESTIONNAIRE**QUESTIONNAIRE FOR PROFESSIONAL DESIGNERS**

We are Chinese student and French researcher of Institute of Textile and Clothing at Hong Kong Polytechnic University.

This questionnaire is to investigate relationships between design elements and human interpretations. The information we collected will be used as data for a research.

A. Picture Analysis

You will have to analyse different pictures. Please, describe the design elements, the most important for your mind. Then, give your interpretation of the garment.

Picture 1:



(source: May 2005 Elle Magazine)

Description:

Message: How do you like about this garment and the accessory? Why? What are your impressions about garments?

~ end of picture analysis ~