



Fashion set design with an emphasis on color harmony using the interactive genetic algorithm

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Abstract

Today, with increasing development of digital technologies and their use to promote and accelerate artistic production trends as well as decrease the utilization of manual and traditional methods, the use of computers has had a special place in fashion design. The present research seeks to design a fashion system utilizing a set of fabric patterns through the interactive genetic algorithm to produce artistic creativity and a set of clothes designs. This system combines clothes components and fabric pattern set, using the interactive genetic algorithm and laws based on color harmony. Then, fitness of the designs created is determined by the user and next generations are produced by this fitness and evolution principles so fashion design trend is performed by the user's opinion. The results of evolutions indicate system efficiency in fashion set design using a fabric pattern set at the least cost and shortest time according to user tastes.

Keywords: Fashion Set Design- Color Harmony- Interactive Genetic Algorithm.

1-Introduction

Design is a very complicated process and often completed by designers who have been systematically trained. In the past, consumers had to make their own clothes or buy from very small producers, but nowadays they can order their favorite pattern to be produced. Garment design aid systems can be helpful to choose and order what they want [1].

2- Theoretical

The present research utilizes the interactive genetic algorithm to promote fashion design level, increase productivity of fashion products, and create confidence in mass producers and purchasers, which its steps are presented in (Fig. 1).

Data used in the research is two types: clothes designs and fabric patterns. First, clothes components including seven parts top, collar, skirt, belt, blouse, sleeve and shoe are designed by consultation with fashion designers each in 11 different designs. Next, fabric patterns, which are designed in 91 various patterns as a set, are divided into 2 groups based on their proportion degree for use in each clothes component in order to be utilized in clothes composition, which the number of their designs is variable.

To solve a problem through the interactive genetic algorithm, the genes in the problem must be coded so that they can be understood. In the research, each clothes design is coded as chromosomes, and clothes components and fabric patterns are coded as genes in the problem through the value coding method, as seen in (Fig. 2). For formulating laws based on principles of color harmony first, the fitness degree of each pattern of the fabric pattern set is examined to use in designing clothes components and, then, chromosomes consisted of clothes components and patterns proportionate to each clothes component are given to the software as coded ones. In fact, genes forming each chromosome are crossed over, based on these laws, to produce initial generation. So, eight clothes designs are produced as initial generation. (Fig. 3) shows steps of formulating laws based on principles of fashion design for designing a set.

After creating clothes designs in first generation, the system continues the number of generation productions, which is three generations (considering first generation, four generations) here, and members of each generation are evaluated by the user. This is done by the system to converge the user's taste and fashion design trend. At the end, the best member of each generation is presented to the user to create the possibility of selection of the best



design among the elite. By selecting one of options, the best design is resulted from implementing the interactive genetic algorithm one time. Examples of the results from designing via the software are presented in (Fig. 4).

3-Results and Discussion

In the research, the interactive genetic algorithm becomes optimum, using laws based on color harmony, for designing a clothes set through fabric patterns. Given that the user's opinion plays a fundamental role in fashion design trend as a fitness function, the presented system was implemented for 39 people to evaluate productivity, and their opinions were obtained by a questionnaire.

4-Conclusion

The results obtained represent users' 72% satisfaction with the proposed system. The use of a set of products is effective to attract audiences' tastes; to give their pre-representation to the user, before production and supply in market, results in corrections in design process through consumer evaluation and artisans' confidence in mass production of these designs.

Reference

1.Zarenejad Z., Hadizadeh M., Payvandy P., & Mashrouteh H. ,Fashion Design Based on Similarity Principles and Interactive Genetic Algorithm, Tex. Sci. and Tech. J., 3, 2, 13-21,2014.

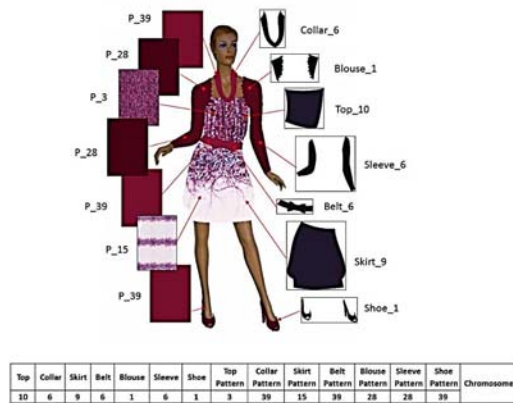


Fig. 1. An example of a garment (chromosome) and its components

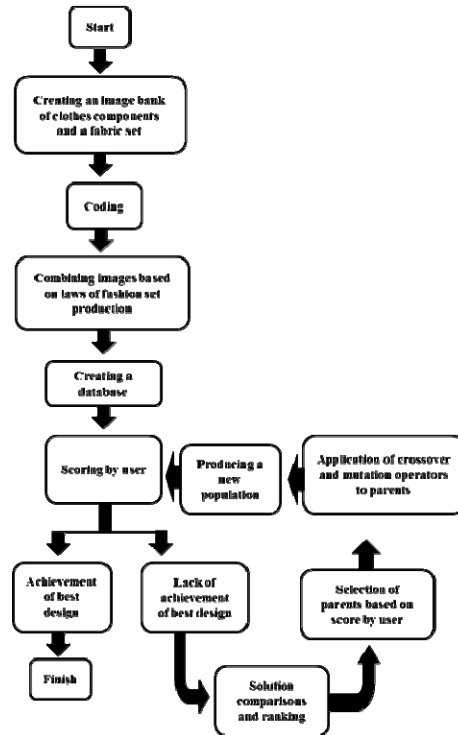


Fig. 2. Implementation trend of the interactive genetic algorithm in fashion design

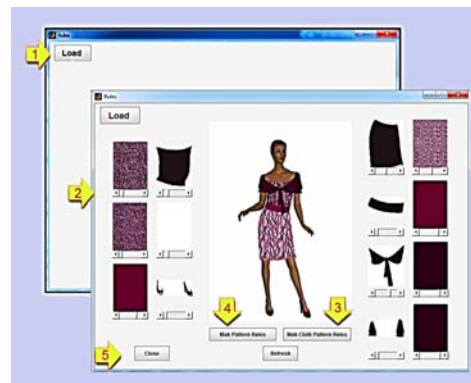


Fig. 3. Steps of formulating laws based on principles of fashion design for designing a fashion set.



Fig. 4. An examples of clothes designs produced by the system