

## *AI, AI, Who Is the Most Beautiful Person in the World?*

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### **Abstract**

This research focuses on applying AI to evaluate students' performance in makeup learning, aiming to provide them with a self-learning reference tool and professional grading assistance. Use AI technology to verify whether facial makeup can enhance facial appeal. This research has two main goals: to achieve the effectiveness of students' makeup learning through AI technology, thus providing beneficial tools for students learning the art of makeup, to evaluate students' makeup skills in major exams in a fast and fair manner, trying to reduce the biases in judgment standards among different evaluators and ensure the consistency of assessment results. The essence of the study aims to establish a teaching assistant model. Using AI technology to verify whether facial makeup can enhance facial appeal. Where AI rated their facial makeup and bare faces after attending courses, providing scores for before and after their makeups. Comparing the bare and made-up faces of 100 models, the study used specific big data algorithms to distinguish between made-up and bare faces. The results prove that AI can effectively evaluate the results of facial makeup. In addition, the study used a CNN model (ResNet18) trained on the SCUTFBP-5500 public dataset, which contains 5500 images of faces. All the images in the dataset were rated in the scale of five by 60 volunteers and is a widely used benchmark for facial beauty evaluation. We aim to eventually develop a new assisting model for makeup education [1].

Keywords: AI Big Data, Makeup, Facial Beauty Prediction, Attractiveness

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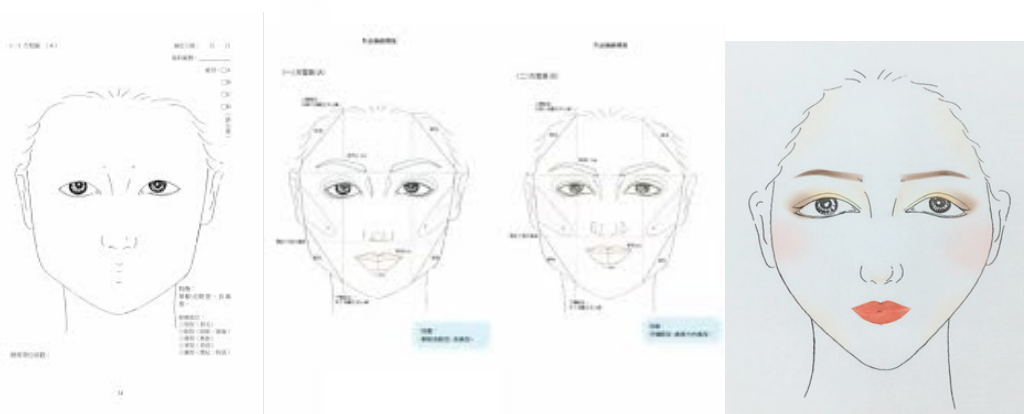
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## I. Introduction

The use of data processing to enhance the good taste of life is the perfect combination of technology and humanity. Not only Data can be quickly and massively accumulated and analyzed [2], but also qualities such as emotional preferences have gradually become quantifiable. Today, makeup is crucial to human beings [3]. Research has found that makeup may affect emotional interaction and interpersonal communication [4]. Physical attractiveness also affects the accuracy and speed of emotion perception. People with beautiful face were judged to be happier [5][6] An attractive person is also more likely to get a higher salary. Statistically, the facial attractiveness of high school graduates is positively correlated with their income Both male and female raters think that women who wear makeup are more attractive and have more social potential than those who do not. In experiments on enrollment status, tip collection and romantic relationships, women who wear makeup get better results [7]. The study surveyed 50 Brazilian women and have them rate themselves on the perspectives of attractiveness, health, self-esteem, femininity, satisfaction with their appearance, age, dominance, self-confidence and competence. The results showed higher scores for people who wear makeup [8]. Makeup has even become a therapy, giving older people a higher sense of well-being [9].

Cosmetics serve as a means to enhance human characteristics. In the field of psychology, there has been a long-term study of the relationship between the perception of biological facial signals and attractiveness [10]. Makeup can not only improve the appearance, evenness and texture of skin but also make people look healthier, more vibrant and youthful [11] [12]. This suggested that the original appearance is not a fixed attribute but rather a self-image and social perception that can be modified and controlled by individuals [13].

Make-up is an important field of fashion in contemporary times. Few colleges or research institutes, however, have considered it as an object of study. We take "makeup" as the research object by bringing artificial intelligence into the field of makeup that has a huge market [14]. It is important to announce that this research will have multiple influences, deconstructing the barriers between colleges and vocational schools. Science and technology research comes from the needs of human nature, and it is hoped that the boundary of makeup education and technology research will also be broader [15]. Taiwan's makeup license exam has great influence Cosmetology students need to learn skills in the process of development. Whether it is makeup or hairdressing, a lot of practice is demanded [16]. we hope that eventually a new assisting model for makeup education will be developed [17].



**Fig. 1 Makeup design drawing for the Class B cosmetology (a) Base drawing of design drawing (b) Completed drawing of design drawing.**

## II. Literature Discussion

The SCUT-FBP5500 dataset [18] is a standard benchmark dataset in facial beauty prediction task, which contains totally 5500 frontal faces collected from Internet with diverse properties and diverse labels labeled with beauty scores ranging from by totally 60 volunteers. SCUT-FBP5500 data set released by South China University of Technology. The dataset can be divided into four subsets with different races and gender, including 2000 Asian females, 2000 Asian males, 750 Caucasian females and 750 Caucasian males as shown in Fig2.

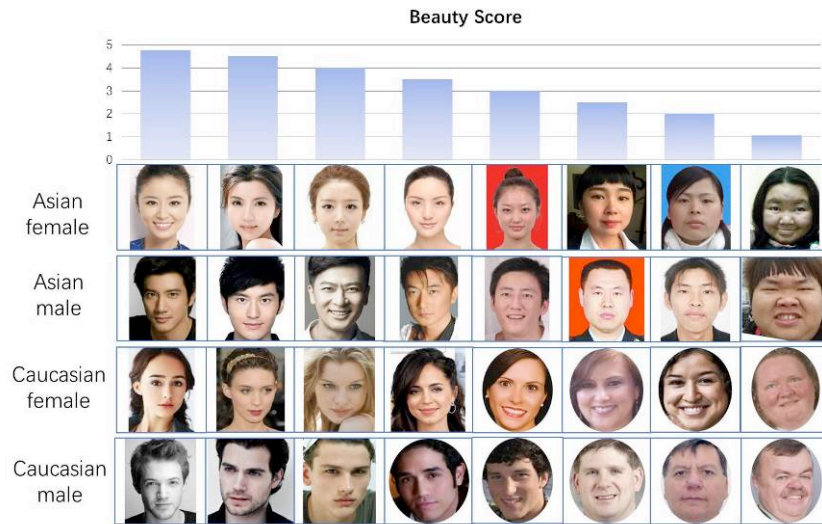


Fig. 2 SCUT-FBP5500 dataset

In this study, we investigate the use of Res Net 18 trained by SCUTFBP5500 as a backbone for score estimation, provided by [19]. ResNet 18 is a deep neural network comprising 18 layers with residual blocks. The residual block is the most important part in Resnet, which includes a shortcut connection, which allows information to flow more easily through the network. This helps prevent the vanishing gradient problem and enables the successful training of deep neural networks.

It is widely use in image classification tasks. Compare to other Resnet architecture, Resnet 18 has smaller model size with a better performance, which allows it to perform various tasks with less resources.

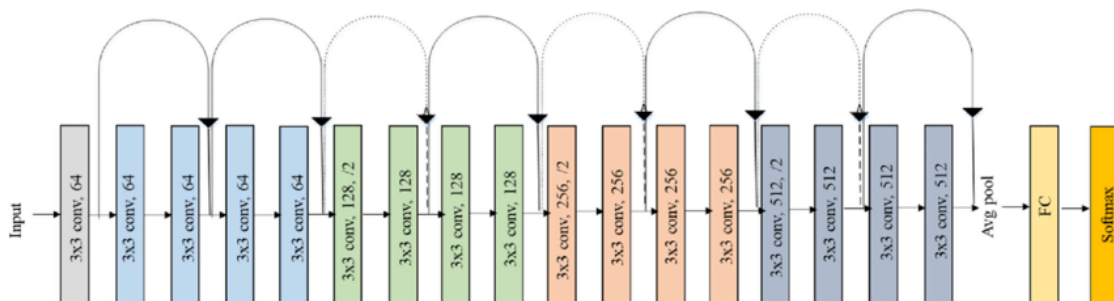
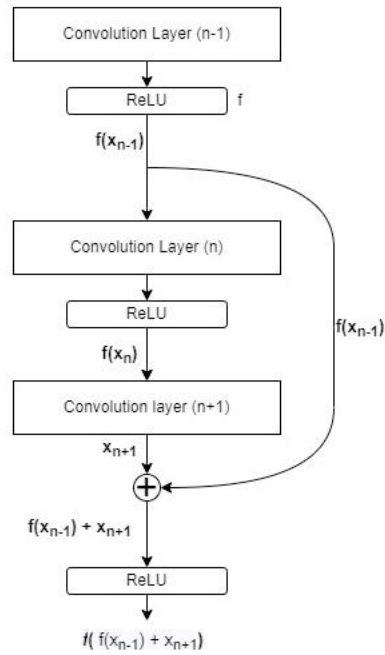


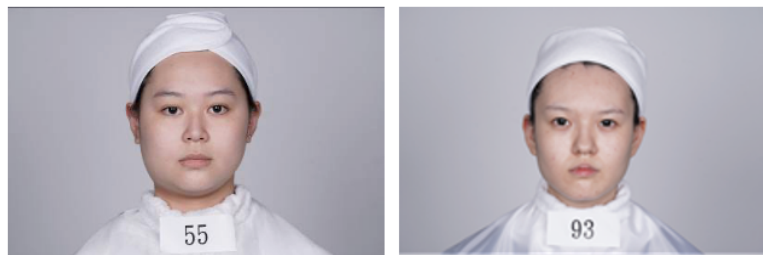
Fig. 3 Res Net 18 is a deep neural network



**Fig. 4 Res Net 18 is a deep neural network**

### III. Research Methodology

The study uses an additional database for experimentation and comparison, involving 100 Asian female models aged between 18 and 21 who contributed a total of 1,200 images and categorized into 5 scoring intervals. Each of the models was assigned a unique number and has two photographs: A) without makeup, and B) with makeup. Before taking the photo, their hair was tied back with hairbands and covered with headscarves to prevent any interference with facial shape. Both the headscarves and clothing were white, and the models maintained a consistent facial angle, with their head and neck positioned forward without facial expressions. This is to ensure that the face was the primary variable in the test.



**Fig. 5 Before the photoshoot, the model's hair was tied up with a hair tie. (Photo without makeup)**



**Fig. 6 There is no hair on the face. Avoid interference from hairstyle affecting your face shape. (makeup photo)**

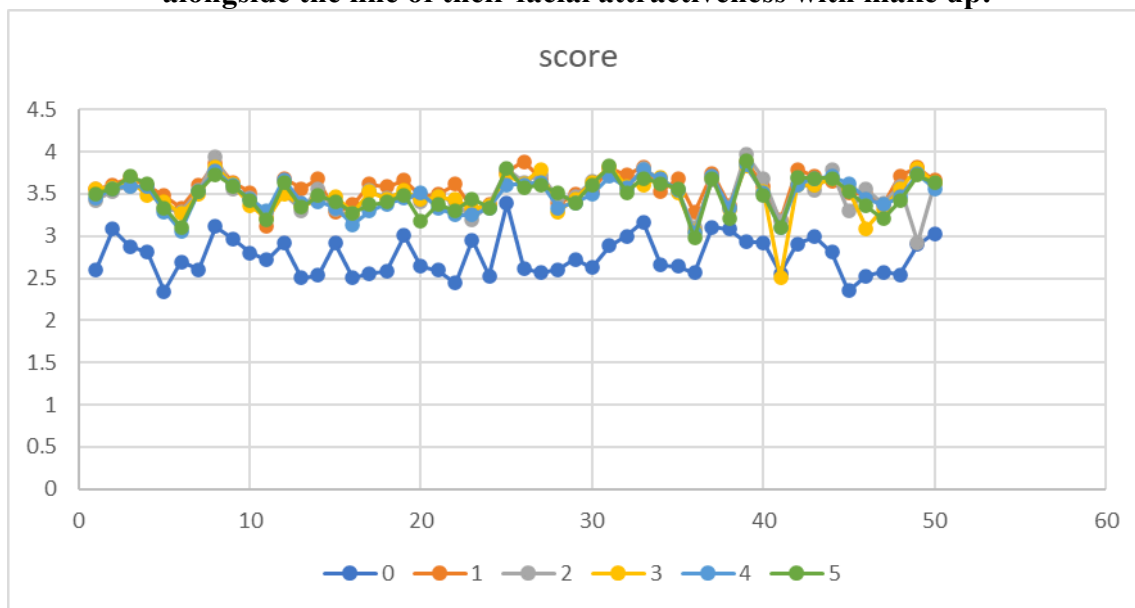
In this stage, the dataset SCUT-FBP5500 has facial photographs with their five-level rating for facial attractiveness. We proceeded to let 60 adults view a series of these photographs and ask them to rate each photo on a scale of 1 to 5.

Research has shown that when having newborns (less than a week old) looking at facial photographs, nearly every baby spends more time staring the more attractive faces. Current studies have also indicated that facial symmetry is an attractive signal. People with higher facial attractiveness often carry specific genes that contribute to symmetrical facial appearance [20][21].

## Experiment Procedure

In our experiment, 100 sets of photos of models without makeup are inputted into our trained machine to obtain scores. Each of the models contributed 5 different types of photos with makeup. The scores for facial attractiveness have significant increase after applying makeup. Below listed the scores for the first 50 models for analysis. The first column indicated the model number and the second shows the score for the model's makeup-free photo.

**Fig. 7 The line graph below shows the curve for models' natural face in blue (0), alongside the line of their facial attractiveness with make up:**



After being rated by AI model, the blue line representing the facial attractiveness scores of the models without make up, which is consistently lower than the scores for the five different makeup styles. This shows that the facial attractiveness scores of those 100 models with makeup are increased.

The Resnet18 was utilized to train a system developed by the SCUT-FBP5500 database. The above mentioned AI trained system demonstrates that makeup dose enhance facial attractiveness. Furthermore, AI has the capability of rapidly and extensively evaluating different makeup techniques.

Marvin Lee Minsky (b1927~2016) , an AI Pioneer, said in Society of Mind (Simon & Schuster Press, Original work published 1986) [22]. "The question is not whether intelligent machines have emotions, but how can machines have no emotions after they have

intelligence." We need to put humanity and culture at the forefront to develop computer capabilities in order to make them more human. The word "Aesthetics" comes from the Greek "αισθητικός", which means sensitive, sensual, and is an adjective used to modify feeling and perception. Immanuel Kant (b1724~1804) (Critique of Judgment, b1789~1790 [23]) believes that when the senses are satisfied, the individual will have a feeling of enjoyment and pleasure, and thus obtain the joy of beauty. But judging whether something is beautiful has a third requirement: the pleasure that arises in the individual must be thought through, because the judgment of beauty is not only sensual but also rational.

## **Conclusion**

Makeup is an existence that cannot be independent of the face. This behavior is influenced to some extent by culture and customs. The face is the beginning of a person revealing themselves to the world. How to use appropriate makeup, it is very important to add points to your appearance. How should I describe it to bring out my own characteristics? Makeup is the embodiment of beauty in life, not only to find a person's bright spot, but also to enhance one's own taste and enjoy the pleasure of appreciating beauty. Adding more rational judgment criteria to the ecosystem of this industry at this stage will be a good factor in the entire makeup ecosystem.

The face is where an individual begins to present themselves to the world. Learning how to use makeup to enhance one's appearance is important. However, how can we showcase our individual characteristic? Makeup is a display of beauty in our daily life, not only for reveal one's highlight but also for promoting our taste and enjoying the pleasure of appreciating aesthetics. The future goal is to develop a better makeup scoring tool which is established with ethical deep leaning unbiased facial aesthetic evaluation. This involves using AI techniques to explore more humanities fields [24].

Our study helps learners understand their level, while bringing a new evaluation method to examination and reduce human control or bias to increase objective in scoring. At the stage in the ecosystem of this industry, rational evaluation criteria are being incorporated. Using AI to assist in determining facial attractiveness can establish standard for beauty evaluation based on data, or even compare different racial conception of beauty. The further research can also address on contemporary ethnic Chinese standard of facial attractiveness. All these represent the potential applications of AI in makeup research with many possibilities yet to be discovered [25].

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