

【大數據應用於建構彩妝審美基準之研究】

Study of AI Aesthetic Benchmark for Makeup Applications

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Artificial Intelligence is one of the trendiest technologies in current times. Beauty, also an important area of interest, has not drawn as much attention from academic researchers. This research is intended to bring artificial intelligence into the global facial make-up market, and to bring more humanity to computing. The norms in beauty, and in this case facial make-up, can be uncovered and presented in more objective ways. This research intends to explore these norms and apply them in the marketability of beauty industry.

Fig. 1 shows the block diagram for the proposed Facial beauty prediction (FBP) system. Initially, we chose the Inception v3 CNN model as the basis for the system. To reduce the impact of the high intra-variability of the face image and ensure that the Inception v3 is able to learn more effectively, we utilized Region Convolution Neural Network (RCNN) and filter to select images which are unstandardized. Table 1 shows that the accuracy of our system based on the Beauty GAN is about 45.87% better compared to the conventional method. By utilizing the Beauty GAN dataset, the proposed system is able to achieve an accuracy of 94%.

Our studio conducted field surveys in order to build up database in Taiwan. In the context of Covid-19, we conducted telephone interviews. There are thirty schools with make-up departments recognized by the Ministry of Education in Taiwan. We have interviewed fifteen teachers from eleven schools. The duration of each interview is between one and two hours. Fig. 2 is a summary of this survey. One of the most important conclusions is this: the size of global make-up industry is similar to the size of the semi-conductor industry. We urge our government to pay more attention to this industry.

Fig. 3 shows the colleges or technological schools. Two out of the thirty-six schools are public funded. The demands in the make-up market is increasing, but the number of schools is decreasing due to low birth rates over the years. This certainly will impact the make-up and beauty industry. Some fellow schools are hoping this research conducted by NTHU will bring changes around to this situation. The fellow schools requested that web platforms be constructed by NTHU to attract students, and to encourage students with make-up skills to upload images useful for our study. Teachers from the schools offered to help with collection of image database. Figs. 4 and 5 show the Web page and the concept of this web platform, respectively.

We believe “beauty”, which is commonly believed to be a subjective set of standards, can be translated into attributable traits, which would be considered objective to some extent, and applied in modern technology. Professional teachers in the beauty industry advised us to free ourselves from the national examination standards. These standards limit our understanding of beauty norms. Dynamic Standard is one advantage with AI. Finding these dynamic objective standards will help the development of make-up engineering, and especially make-up critiquing. We need massive volume of image samples for this study. We intend to take this opportunity to share academic resources with the related schools, and with the industry, in order to engage the industry in the research, to broaden and deepen the study. In return, the academia should refresh the techniques and bring about technological upgrades.

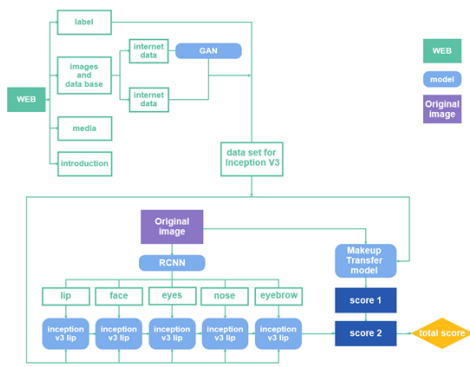


Fig. 1. Proposed FBP system based on the RCNN and Inception v3 models.

Table 1. Performance comparison between different methods.

CNN Model	Databases	Preprocessing	ACC(%)
Inception V3	BeautyGAN	proposed	94.0
Inception V3		N/A	45.8
General		N/A	72.1

田野調查訪談紀錄資料

- 2018 年全球化妝產值 5000 億美元比半導體產業高，國人可以更注重這個產業。
- 可與寶陶樂公司可以做影像合作，因為他們幫所有社會新鮮人拍攝彩妝形象照片。

- 主題性在彩妝中是重要的分類法，另外要分層級，對於不同類型的美學定義要做出來。
- 建議能做出分類濃妝、淡妝的分類；很多時候濃妝不濃，淡妝也不淡。
- 可以以色彩學做判斷，包括冷色妝、暖色妝標準訂定，軟體會更有人性。

- 勞動部技術檢定中心有乙丙級執照考題。
- 就研究而言鎖定乙級執照的好處是題目會有一個架構，甚至可以和職訓局中部辦公室合作。

Fig. 2. Excerpted fieldwork records.

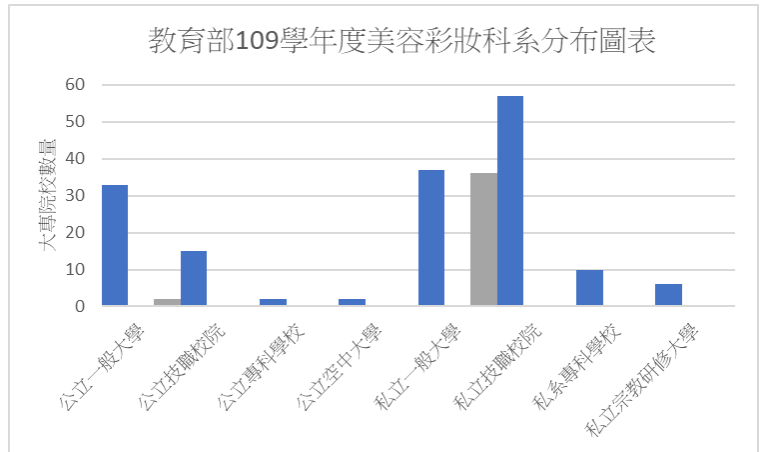


Fig. 3. Distribution map of makeup departments of colleges and universities affiliated to the Ministry of Education



Fig. 4. Web Design

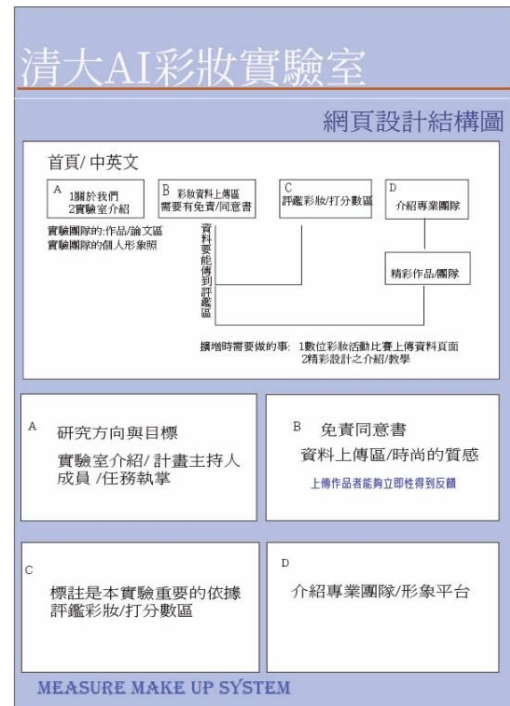


Fig. 5 Webpage design structure