Correction

February 21, 2023

1 Detection algorithm for pigmented skin disease based on classifier-level and feature-level fusion

Official implementation of the paper : Detection algorithm for pigmented skin disease based on classifier-level and feature-level fusion

1.1 Noting

- Code will be released in the future.
- The category names in the data set were mislabeled in the paper published online due to an author's negligence.

Original index	Correct index
nv	akiec
mel	bcc
bkl	bkl
bcc	df
akiec	nv
vasc	mel
df	vasc

Figure 2,Table 1,Table 3,Table 4,Table 5,Table 6 Table 7

The category index of each row of these tables and images is misaligned and needs to be corrected as above.

And the following text needs to replace akiec with nv

3.1. System architecture

As seen from Figure 1, the proportions of the different categories after image pretreatment are seriously unbalanced; among them, the "nv" category occupies 66.95% of the dataset. If no processing is performed, the neural network will seriously prefer this category in model training.

Image augmentation: As the nv category accounts for 66.95% of the dataset, if dataset balance needs to be achieved, other categories need to be upsampled. First, skin images (except those in the nv category) are preprocessed by turning them left and right, reversing up and down, symmetric rotation (the calculation process is shown in Algorithm 1) and performing image style transfer (the

calculation process is shown in Algorithm 2) to achieve a balance between the various categories of images.

3.2.1 Dataset

Cases include a representative collection of all import diagnostic categories in the realm of pigmented lesions. The seven types are melanocytic Nevi (nv), Melanoma (mel), Benign Keratosis-like Lesions (solar lentigines/seborrheic keratoses and lichen-planus-like keratoses) (bkl), Basal Cell Carcinoma (bcc), Actinic Keratoses and Intraepithelial Carcinoma/Bowen's disease (akiec), Vascular lesions (angiomas, angiokeratomas, pyogenic granulomas, and hemorrhage) (vasc), and Dermatofibroma (df). The corresponding amounts of image data are 6705, 1113, 1099, 514, 327, 142, and 115, respectively.

3.2.2. Image preprocessing and augmentation

First, we carry out the following basic operations on the images (except for those in the nv category): left and right mirror rotation, up and down mirror rotation, symmetric rotation, etc.; these operations can balance the images to a certain extent.

First, this paper calculates the sample size differences between nv and the other categories in the image dataset according to Equation (2) and then divides each difference by the sample size of the corresponding category to obtain the sample size "n" that needs to be randomly added to the other categories.

$$Add_d = \frac{Num(Class\_nv) - Num(Class\_i)}{Num(Class\_i)}$$

it indicates that the data volume of this category is not very different from that of nv. In this paper, the number of data differences is randomly extracted for image style transfer.

4.3.1. Test results of a single classifier

Where n_classes represents the number of categories, and differences represents the difference between this category and the category nv.

However, it can be seen from the Acc and F1 values in the table that the detection rate of the "nv" category is much higher than that of the other categories, indicating that a single model has certain anti-interference ability limitations with respect to the images generated by the algorithm.