SDU-Haier-AQD: A Dataset for Appearance Quality Detection

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Abstract：

SDU-Haier-AQD (Shandong University-Haier-Appearance Quality Detection) is an image dataset jointly constructed by Shandong University and Haier, which contains a various of air conditioner external unit image collected during actual detection process. The appearance quality detection of air conditioner external unit is a crucial step before the air conditioner external units are sealed and put into storage. If the problem is reported back during the sales process or after sale, the negative impact on the brand will undoubtedly be serious. However, in this industrial field, the main solution is manual inspection by workers or detection by traditional image processing algorithms, which either have higher labor cost or lower detection accuracy. In order to enhance the intelligence of the factory, reduce costs and improve efficiency, the application of deep learning algorithm is extremely urgent. The design and training of the algorithm need to be based on the actual appearance image and corresponding labels of key characteristics, but the dataset in this area is currently almost blank. Therefore, we collected a mass of images of air conditioner external unit in Haier factory, labeled a batch of key characteristics in air conditioner external unit images. This dataset will be useful for researchers in object detection, intelligent manufacturing, artificial intelligence algorithm design, etc.

Dataset Description

SDU-Haier-AQD Dataset is consisted of 10449 images, and the samples in the dataset are collected in real time on the actual industrial production line. In the labeling process, we mainly selected 11 typical models, marked the typical appearance feature (Brand logo, Connector pipe head and Air outlet net cover), and divided the feature into 16 labels. The images in the dataset are uniformly in jpg format, and the image size is 2464×2056 or 1232×1028. All image are named with the prefix 'Ax_' to distinguish different types. Table 1 shows the number of images in different types.

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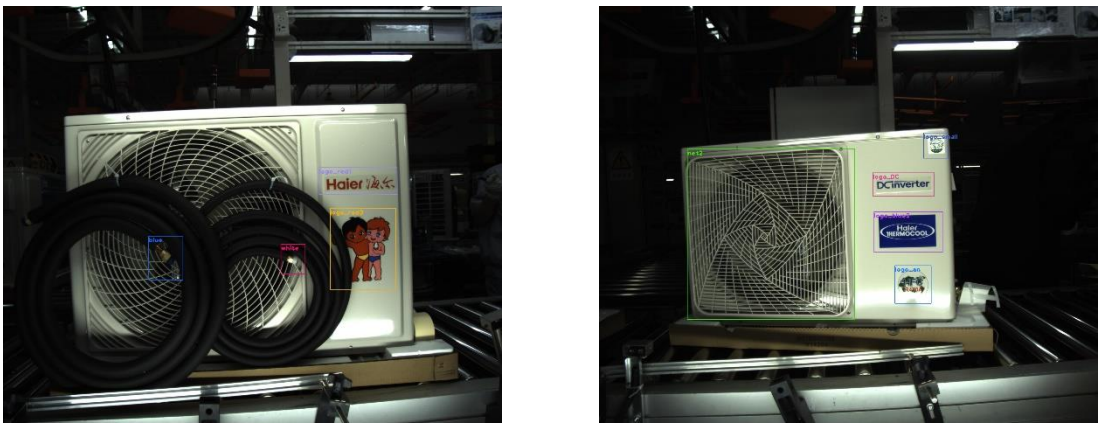
Table 1 The number of images in different types

Type	Number	Type	Number	Type	Number
A1	1003	A5	1000	A9	1000
A2	999	A6	811	A10	1015
A3	999	A7	1134	A11	455
A4	1033	A8	1000		

All the labels are saved as .xml files. It contains the size of the image, the name and location of the different labels. Table 2 shows the names of different label types and the number of them. The labels prefixed by color indicate different types and colors of connector pipe heads, the labels prefixed by logo indicate different types of brand logos, and those prefixed by net indicate air outlet net cover labels.

Table 2 Different Number of Labels

Label	Number	Label	Number	Label	Number
white	5946	logo_york	1033	logo_DC	1015
blue	3002	logo_blue	1000	logo_an	1015
black	2944	logo_red1	3589	net1	1488
blue_sp	1000	logo_red3	3589	net2	2015
white_sp	1000	logo_blue2	1015		
logo	3812	logo_small	1015		



(a) (b)

Figure 1 Samples of label

Fig.1 (a) and Fig.1 (b) show the label labeled on the image. This is just an example to illustrate the labeled method, and all the samples in dataset are original without beening altered.

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If you have any questions or suggestions, do not hesitate to contact the corresponding author: Prof. Dongfeng Yuan, dfyuan@sdu.edu.cn

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