

APPENDIX

In this appendix, we give more details about the datasets that used in our experiments. They are benchmark datasets and fashion and textile datasets.

Benchmark Datasets

1) *Benchmark Datasets:*

CIFAR10 Database [5] is a well-known database for image classification and retrieval. The dataset contains 60,000 images with 10 categories (airplane, automobile, bird, cat, deer, dog, frog, horse, ship, truck). We used a subset of 6,000 images from the dataset in our experiment. The subset contains 500 and 100 images of each category to form the training set (5,000 in total) and testing set (1,000 in total), respectively. Each image in the testing set was used to query similar images from the remaining of this subset.

ImageNet Database [7] is a large-scale image benchmark for image retrieval and recognition. The database contains over 1.2M images in the training set and 50K images in the testing set, where each image is labelled with single category from 1,000 categories. We followed the setup in HashNet [3] to construct the training and testing sets and the images from the training set were also used as database in our experiment.

NUSWIDE Database [4] is a benchmark database that widely used for real-world web image retrieval. There are total 269,648 images which were collected from Flickr.com. Each image is annotated with multiple labels, corresponding with 81 ground truth concepts. In our experiment, we used a subset of 15,000 images, among which 10,000 images were used for training and the rest are used for testing. The training set was also used as database for query.

2) *Fashion and Textile Datasets:*

XLFabric Database is a database for fabric defect classification. We collected the images from AI Challenge in Xuelang Manufacturing: Visual Computing Assisted Quality Inspection in 2018 [1]. The image collection was completed by the following steps. First, we extracted the annotated regions from the original public images, and then manually classified them into 7 categories, i.e. hole, float, missing end, missing pick, draw back end, weft crackiness and normal. The total amount of images on the database is 6,246 with 4,503 for training, 621 for validation and 1,122 for testing. In the experiments, all images were resized to 256×256 pixels with gray-level. The sample images on the XLFabric database can be seen in Fig. 1 and Fig. 3 (a) lists the number of each category.

GDFabric Database is also a database for fabric defect classification. We collected the images from the competition of Guangdong Industrial Intelligence Innovation which was jointly launched by Guangdong Government and Alibaba Group in 2019 [2]. The images were captured from Textile Workshop in Nanhai, Foshan, Guangdong Province in China, containing 8,000 solid color and 12,000 multi-colored fabric images. In our experiment, we selected 12 main categories from the defective images according to the corresponding labels. The categories include coarse end, draw back end, broken spandex, colour smear, knot, reediness, neps, hole, triple yarn, dirty, float and normal. Different from XLFabric Database, the images recorded the back side of the fabric while the front side was shined by the light. There are total 13,024 images on GDFabric database in which each category has a different amount of images. The sample images on the GDFabric database can be seen in Fig. 2. For easy reading, Fig. 3 (b) lists the number of each category on this database.

Fashion-MNIST Database [8] is a dataset of Zalando’s article images. There are 10 categories with total 70,000 images containing 60,000 images as training samples and 10,000 as testing samples. This database was used to evaluate the performance of the proposed method under the case of large-scale image classification and retrieval. [8] shows more details about this database.

DeepFashion Database [6] was used for category classification and similarity retrieval in our experiments. This database has total 63,720 diverse images with 50 categories. We selected a subset from the DeepFashion database in our experiment. The subset contains 51,267 images with 10 categories, among which 37,025 images were used as training and the rest 14,242 images were used for testing. The images are with size of 256×256 pixels.

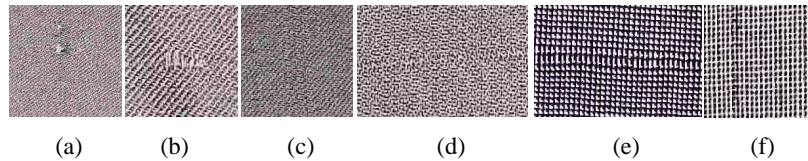


Fig. 1: Defective images on the XLFabric Database. (a) Hole, (b) Float, (c) Missing End, (d) Missing Pick, (e) Weft Crackiness, (f) Draw Back End.

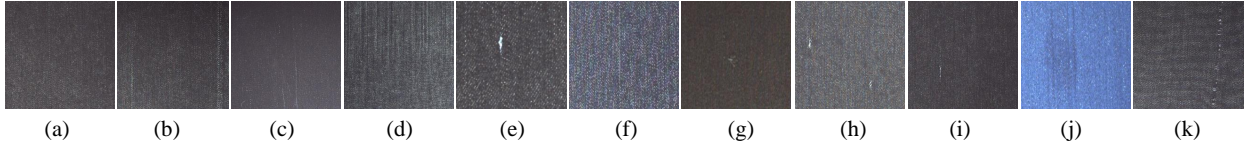


Fig. 2: Defective images on the GDFabric Database. (a) Coarse End, (b) Draw Back End, (c) Broken Spandex, (d) Color Smear, (e) Knot, (f) Reediness, (g) Neps, (h) Hole, (i) Triple Yarn, (j) Dirty, (k) Float.

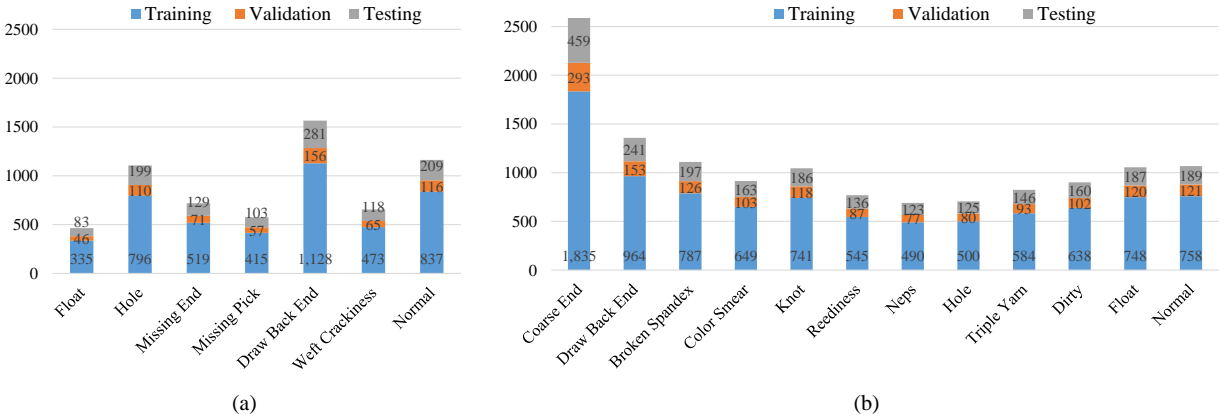


Fig. 3: The number of each category used in training, validation and testing on (a) XLFabric and (b) GDFabric datasets.

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