



Data Article

Traditional chinese god image dataset: A glimpse of chinese culture



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ABSTRACT

This data article describes a dataset of images of common Chinese deities. The dataset is divided into five categories according to the types of deities, and a total of 1314 original images were captured by smart phones from Chinese temples and through Google search engine. Each category were split into training, validation and test subsets in a ratio of 70:20:10. We rotated the pictures by 30°, 60°, 90°, 120°, 150°, and 180°; and zoomed in and out to augment the images for training and validation sets. After data enhancement, the total number of images reaches 10,786. Two models, EfficientNet-B0 and MobileNetV2, are used to identify five kinds of god images. After data augmentation, the accuracy, precision, recall, specificity and F1-score of EfficientNet-B0 were 96.15%, 96.44%, 96.18%, 96.16% and 97.60%, respectively; the accuracy, precision recall, specificity and F1-score of MobileNetV2 were 92.31%, 92.89%, 92.37%, 92.33% and 95.19%, respectively. This dataset can be used as a reference for traditional Chinese god statue images, and can also be used for object detection and image classification through machine learning and deep learning methods.

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Specifications Table

Subject	Arts and Humanities, Computer Science
Specific subject area	Image identification, Image classification
Type of data	Images
How data were acquired	Traditional Chinese god statue images were captured by smart phones from Chinese temples and through Google search engine
Data format	Raw digital image (JPG format)
Parameters for data collection	Partial and full-body images of each category are collected; images with cluttered background are cropped; images with low resolution are deleted.
Description of data collection	Collect deity images and divide them into five categories according to the type of deity.
Data source location	Institution: National Chin-Yi University of Technology City: Taichung Country: Taiwan Latitude 24.1450556 and Longitude 120.73011
Data accessibility	Repository name: Dataset of traditional Chinese god statue Data identification number: 10.17632/z6t86sjwts.2 Mendeley Data, V1, https://doi.org/10.17632/z6t86sjwts.2

Value of the Data

1. The dataset provides images of five types of Chinese god statues, which can help people from other culture to understand Chinese religious culture and identify Chinese gods.
2. This dataset is not only an illustrated book of Chinese gods, but also a popular teaching material for people with different cultural backgrounds.
3. This dataset contributes to the promotion of Chinese religious culture.
4. This dataset can be used to develop recognition systems of Chinese god to aid in image classification and post-classification applications.

Objective

All the Chinese god statues are carved with the same raw materials, the colors and appearances are somewhat similar. From the perspective of people with different cultural backgrounds, it is really difficult to distinguish the difference in the first place. At present, there is no dataset of traditional Chinese god statue can be referenced. In order to allow more people to understand Chinese cultural beliefs and promote Chinese culture, this article proposes a collection of images of common Chinese deities. This dataset can be used as a reference for Chinese statue images, and can also be used for object detection and image classification of Chinese statue images through machine learning and deep learning methods.

1. Data Description

The images of this dataset are collected by smart phones from Chinese temples and the Google search engine, and there are five types of gods in total: (1) Ma-Zu, (2) Sam-Tai-Zu, (3) Earth God, (4) Guan Yu, and (5) Guanyin Bodhisattva. Among the above five gods, there are three gods of Taoism: Ma-Zu, Sam-Tai-Zu, and Earth God. Among them, Ma-Zu symbolizes the guardian deity of the sea. The worship of the people living along the coast and the fishermen gradually formed a belief, which has continued to this day; Sam-Tai-Zu symbolizes the protection god. In addition to the meaning of exorcizing evil spirits, it is also used to pray for safe driving because of the image of stepping on a hot wheel; Earth God is the patron saint of the place. Most places where Han people live are enshrined, which means praying for blessings and keeping peace. Guan Yu and Guanyin Bodhisattva belong to Buddhism. Because of Guan Yu's righteous image as a general during his lifetime, believers are not only the military and police, but also including people cross other related industries; The images and sayings of Guanyin

Image					
Number	324	126	240	380	244

Fig. 1. Examples of traditional Chinese god statue.

Bodhisattva are very diverse, but what they have in common is that the image of compassion is deeply rooted in the hearts of the people, and believers are spread all over the place. Further descriptions of the individual files and folders in the dataset are provided in [Table 1](#).

We have 1314 original images in total. The number of images for each category is summarized as follows: (1) Ma-Zu 324; (2) Sam-Tai-Zu 126; (3) Earth God 240; (4) Guan Yu 380; (5) Guanyin Bodhisattva 244. Examples of traditional Chinese god statue are shown in [Fig. 1](#).

Table 1

List of individual files and folders in the dataset.

File or folder name	Description
traditional Chinese god statue	Name of the dataset
Original	This folder contains five categories of the original images.
Original- Ma-Zu	This folder contains three subsets of the original images for Ma-Zu.
Original- Ma-Zu -train	This folder contains 227 images for training subset of the original images for Ma-Zu.
Original- Ma-Zu -test	This folder contains 32 images for test subset of the original images for Ma-Zu.
Original- Ma-Zu -val	This folder contains 65 images for validation subset of the original images for Ma-Zu.
Original- Sam-Tai-Zu	This folder contains three subsets of the original images for Sam-Tai-Zu.
Original- Sam-Tai-Zu -train	This folder contains 89 images for training subset of the original images for Sam-Tai-Zu.
Original- Sam-Tai-Zu -test	This folder contains 12 images for test subset of the original images for Sam-Tai-Zu.
Original- Sam-Tai-Zu -val	This folder contains 25 images for validation subset of the original images for Sam-Tai-Zu.
Original-Earth God	This folder contains three subsets of the original images for Earth God.
Original-Earth God-train	This folder contains 168 images for training subset of the original images for Earth God.
Original-Earth God-test	This folder contains 24 images for test subset of the original images for Earth God.
Original-Earth God-val	This folder contains 48 images for validation subset of the original images for Earth God.
Original- Guan Yu	This folder contains three subsets of the original images for Guan Yu.
Original- Guan Yu -train	This folder contains 266 images for training subset of the original images for Guan Yu.
Original- Guan Yu -test	This folder contains 38 images for test subset of the original images for Guan Yu.
Original- Guan Yu -val	This folder contains 76 images for validation subset of the original images for Guan Yu.
Original- Guanyin Bodhisattva	This folder contains three subsets of the original images for Guanyin Bodhisattva.

(continued on next page)

Table 1 (continued)

File or folder name	Description
Original- Guanyin Bodhisattva -train	This folder contains 171 images for training subset of the original images for Guanyin Bodhisattva.
Original- Guanyin Bodhisattva -test	This folder contains 24 images for test subset of the original images for Guanyin Bodhisattva.
Original- Guanyin Bodhisattva -val	This folder contains 49 images for validation subset of the original images for Guanyin Bodhisattva.
After augmentation	This folder contains five categories of the images after augmentation.
After augmentation - Ma-Zu	This folder contains three subsets of the images after augmentation for Ma-Zu.
After augmentation - Ma-Zu -train	This folder contains 2043 images for training subset of the images after augmentation for Ma-Zu.
After augmentation - Ma-Zu -test	This folder contains 32 images for test subset of the images after augmentation for Ma-Zu.
After augmentation - Ma-Zu -val	This folder contains 585 images for validation subset of the images after augmentation for Ma-Zu.
After augmentation - Sam-Tai-Zu	This folder contains three subsets of the images after augmentation for Sam-Tai-Zu.
After augmentation - Sam-Tai-Zu -train	This folder contains 801 images for training subset of the images after augmentation for Sam-Tai-Zu.
After augmentation - Sam-Tai-Zu -test	This folder contains 12 images for test subset of the images after augmentation for Sam-Tai-Zu.
After augmentation - Sam-Tai-Zu -val	This folder contains 225 images for validation subset of the images after augmentation for Sam-Tai-Zu.
After augmentation -Earth God	This folder contains three subsets of the images after augmentation for Earth God.
After augmentation -Earth God-train	This folder contains 1512 images for training subset of the images after augmentation for Earth God.
After augmentation -Earth God-test	This folder contains 24 images for test subset of the images after augmentation for Earth God.
After augmentation -Earth God-val	This folder contains 432 images for validation subset of the images after augmentation for Earth God.
After augmentation - Guan Yu	This folder contains three subsets of the images after augmentation for Guan Yu.
After augmentation - Guan Yu -train	This folder contains 2394 images for training subset of the images after augmentation for Guan Yu.
After augmentation - Guan Yu -test	This folder contains 38 images for test subset of the images after augmentation for Guan Yu.
After augmentation - Guan Yu -val	This folder contains 684 images for validation subset of the images after augmentation for Guan Yu.
After augmentation - Guanyin Bodhisattva	This folder contains three subsets of the images after augmentation for Guanyin Bodhisattva.
After augmentation - Guanyin Bodhisattva -train	This folder contains 1539 images for training subset of the images after augmentation for Guanyin Bodhisattva.
After augmentation - Guanyin Bodhisattva -test	This folder contains 24 images for test subset of the images after augmentation for Guanyin Bodhisattva.
After augmentation - Guanyin Bodhisattva -val	This folder contains 441 images for validation subset of the images after augmentation for Guanyin Bodhisattva.

2. Experimental Design, Materials and Methods

1. Image acquisition

The religious beliefs of Taiwanese are mostly Buddhism and Taoism. Among them, there are five kinds of gods that most people believe in, including (1) Ma-Zu, (2) Sam-Tai-Zu, (3) Earth God, (4) Guan Yu, and (5) Guanyin Bodhisattva. The original images were captured by smart phones from Chinese temples and through Google search engine. The format of images are in JPG, and images sizes are not equal.

Table 2

Number of images before and after data augmentation.

ID	Name	Original				After Data Augmentation			
		Train	Val	Test	Total	Train	Val	Test	Total
1	Ma-Zu	227	65	32	324	2043	585	32	2660
2	Sam-Tai-Zu	89	25	12	126	801	225	12	1038
3	Earth God	168	48	24	240	1512	432	24	1968
4	Guan Yu	266	76	38	380	2394	684	38	3116
5	Guanyin Bodhisattva	171	49	24	244	1539	441	24	2004
Total		971	263	130	1314	8289	2367	130	10,786

2. Image preprocessing

The ratios of the god statue to the whole image are different. In addition, some of the images are blurry. We deleted the images with blurry and undersized ratio of the god statues. Finally, We have a total of 1314 raw images in 5 categories.

3. Image partition

The dataset was divided by each category into training, validation and test subsets in a ratio of 70:20:10. For example, the number of training, validation, and test images for the original images of Sam-Tai-Zu are 89, 25, and 12, respectively, and the total number of training, validation, and test subsets after data augmentation are 801, 225, and 12, respectively. [Table 2](#) shows the details for the subsets.

4. Image augmentation

We adjust the images by rotating the pictures by 30°, 60°, 90°, 120°, 150°, and 180°; and zooming in and out to augment the images for training and validation sets. After data augmentation, the total number of images reaches 10,786. Examples of data augmentation are shown in [Fig. 2](#).

5. Image classification

Two models, EfficientNet-B0 and MobileNetV2, are used to identify five kinds of god images. Google developed a series of image recognition models EfficientNet based on the AutoML framework in 2019, and EfficientNet-B0 is the baseline model in the entire model series. The architecture has a total of nine layers. The first and ninth layers are convolutional layers. Layers two to eight are MBConv repeated stacking [1]. MobileNetV2 uses a lightweight deep convolutional layer in the middle to further improve performance [2]. The classification results of the above two models on the dataset before and after data augmentation are listed in [Table 3](#). Before data augmentation, the accuracy, precision, recall, specificity and F1-score of EfficientNet-B0 were 94.62%, 94.64%, 94.61%, 94.63% and 96.63% respectively; the accuracy, precision recall, specificity and F1-score of MobileNetV2 were 90.00%, 90.82%, 90.43%, 90.14% and 93.75%, respectively. After data augmentation, the accuracy, precision, recall, specificity and F1-score of EfficientNet-B0 were 96.15%, 96.44%, 96.18%, 96.16% and 97.60%, respectively; the accuracy, precision recall, specificity and F1-score of MobileNetV2 were 92.31%, 92.89%, 92.37%, 92.33% and 95.19%, respectively. [Fig. 3](#) presents the training curves and losses of two models before and after data augmentation. [Fig. 4](#) is the confusion matrix and ROC curves.





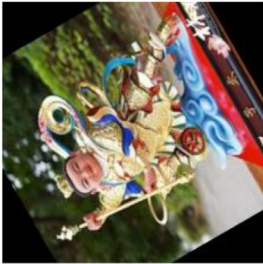
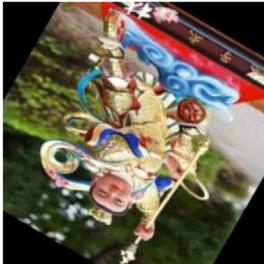
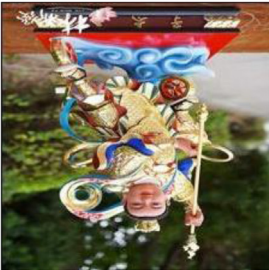


		
Original image	30° rotation	60° rotation
		
90° rotation	120° rotation	150° rotation
		
180° rotation	Zoom 0.5	Zoom 1.5

Fig. 2. Examples of data augmentation.

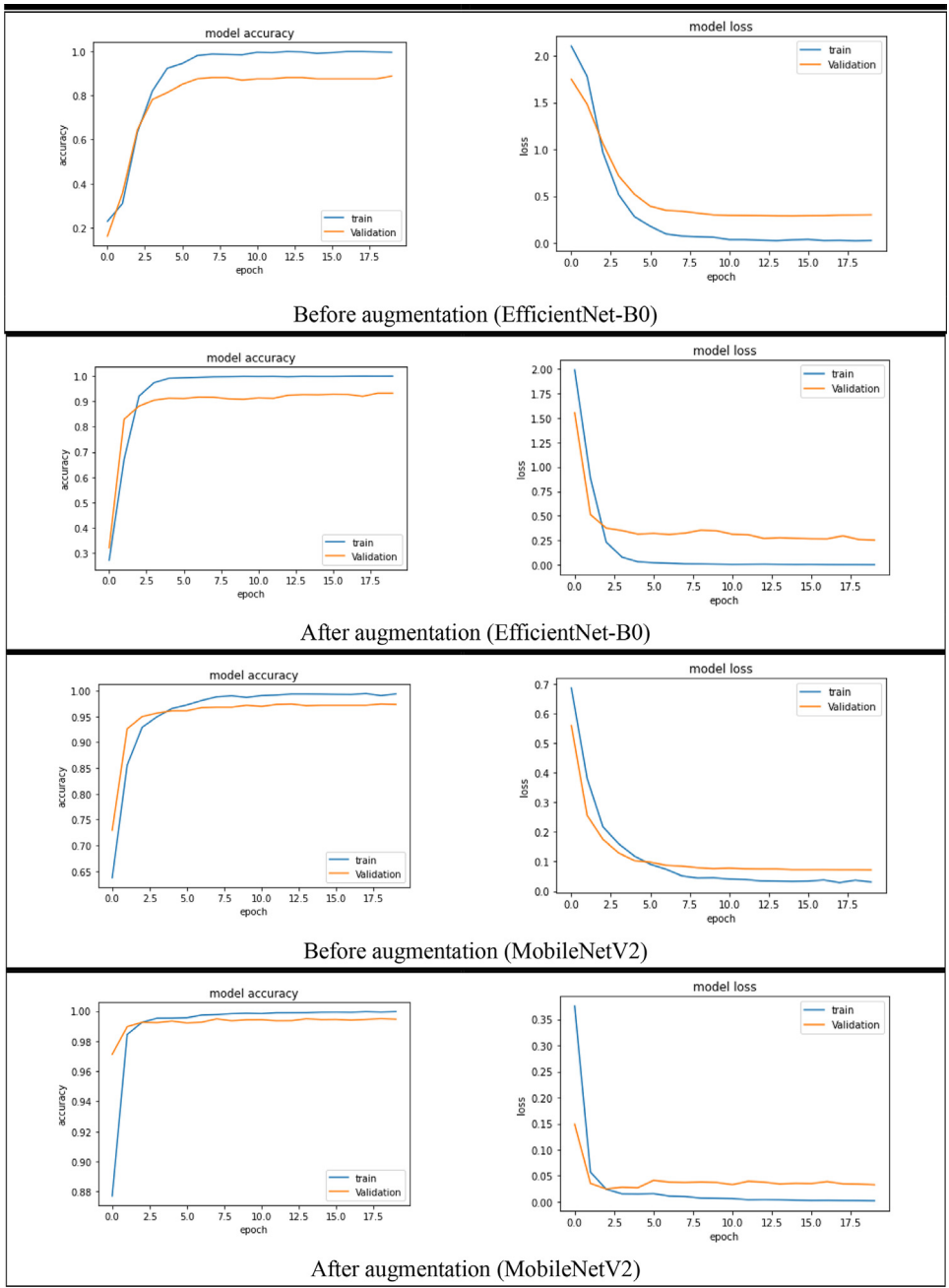


Fig. 3. Training curves of two models.

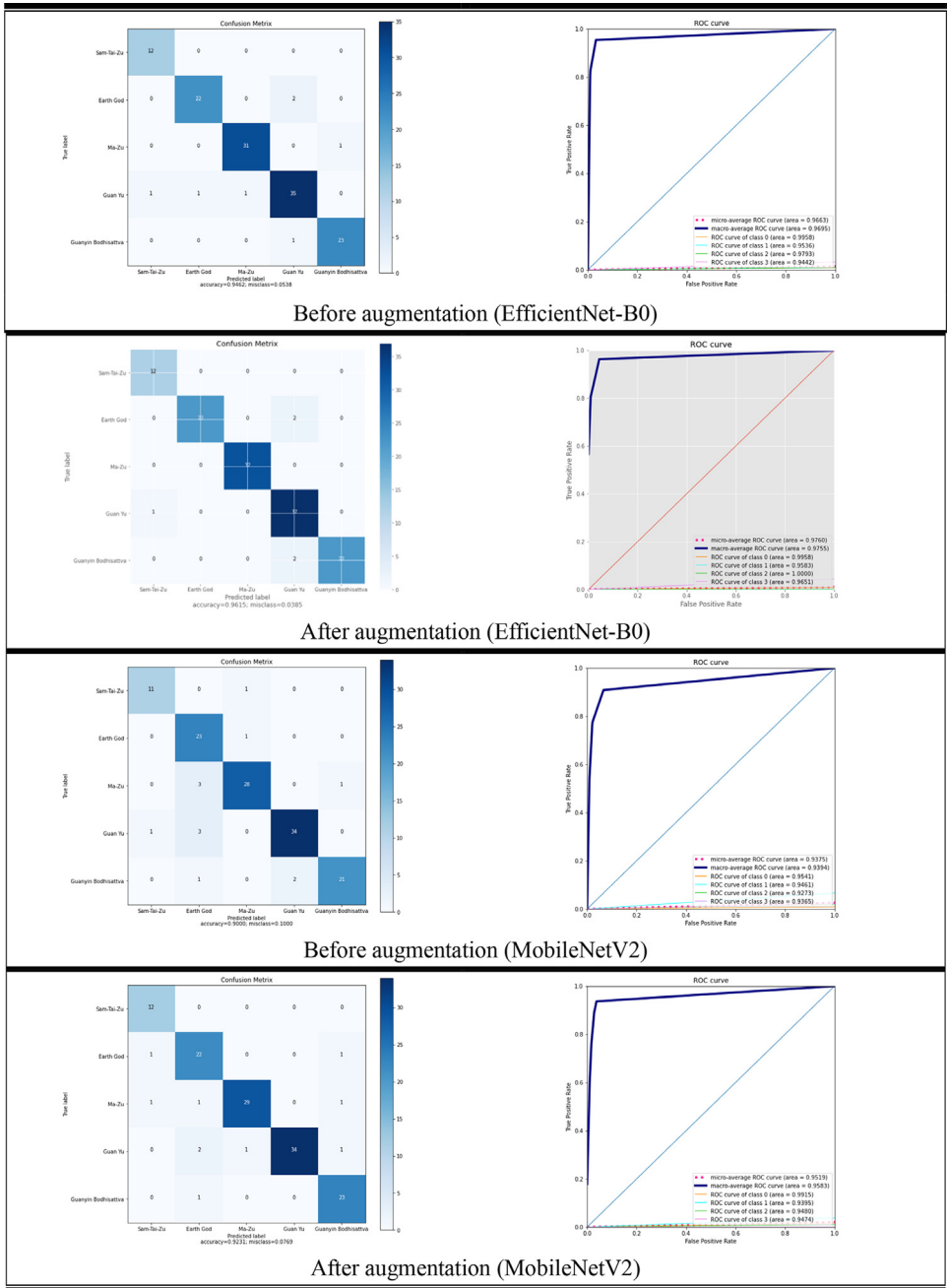


Fig. 4. Confusion matrix and ROC curves of two models.

Table 3

Model performance.

Performance before data augmentation					
	Accuracy	Precision	Recall	Specificity	F1-score
EfficientNet-B0	94.62%	94.64%	94.61%	94.63%	96.63%
MobileNetV2	90.00%	90.82%	90.43%	90.14%	93.75%
Performance after data augmentation					
	Accuracy	Precision	Recall	Specificity	F1-score
EfficientNet-B0	96.15%	96.44%	96.18%	96.16%	97.60%
MobileNetV2	92.31%	92.89%	92.37%	92.33%	95.19%

Ethics Statement

This study did not conduct experiments involving humans and animals.

CRediT Author Statement

Mei-Ling Huang: Conceptualization, Methodology, Writing – Original draft preparation, Investigation, Supervision, Writing – Reviewing and Editing; **Yu-Chieh Liao:** Methodology, Writing – Original draft preparation, Software; **Yu-Lun Tseng and Kai-Ling Shiau:** Data curation, Writing – Original draft preparation.

Declaration of Competing Interest

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Data Availability

[Dataset of traditional Chinese god statue \(Original data\)](#) (Mendeley Data)

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