Bird Species Recognition Based on Digital Image Processing
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Abstract:
Bird species recognition is a sophisticated problem due to variant illumination and also different view point of camera. In this project, a new feature which is the ratio between the distance of the eye to the root of beak and the distance of the width of the beak is used to distinguish the bird species. Integrated the new feature into the multi-scale decision tree and the SVM, a new bird species recognition algorithm is proposed to get the final recognition result. The project results show that the proposed new feature can improve the correct classification rate about nine percent.

I. INTRODUCTION
In this study, we can learn about bird-species recognition keywords are input, and the Web image is refined using the web image collector as the learning data. We propose a method to generate a bird-species recognition model. First, if you enter the name of the targeted bird, the image will be collected from the Web using the image crawl. To refine the collected images into the training dataset, the corrupted image is corrected and deleted, the outlier is removed, and finally the image is expanded to obtain the refined training data. In the outlier removal, the features are extracted using the deep learning of the data collected for keyword. Then, the cluster distance of each label is measured using the K-means clustering that forms the training data according to the measured cluster distance. In addition, the recognition-rate change according to various parameter changes is confirmed.

As a result, the proposed method shows different recognition rates than the data collected from the existing process.

II. PROPOSED SYSTEM
In this project, only the bird-species recognition keywords are input, and the Web image is refined as the learning data. We propose a method to recognize a bird-species through learning a model. When only the name list regarding the recognizer creation is input, the necessary image for the image recognizer is automatically collected using the Web image collector. It avoids the heavy time consumption of labelling. The multi-scale feature learning, and also to achieve performance for fine-grained image classification. Overlapped parts are reduced and also highlights the selected parts, which eliminates the redundant parts and enhances the discrimination of selected parts.

III. BLOCK DIAGRAM

IV. METHODOLOGY

Preprocessing
Pre-processing is a basic operations that extracted image without any distortions at the lowest level of abstraction. Aim of pre-processing is to minimize unwanted distortions of an image or enhances image features better for forthcoming processing. Like the mean filter, the median filter considers each pixel within the image successively and appears at its nearby neighbors to form a choice whether or not it's representative of its surroundings. Rather than simply replacing the pixel value with the mean of neighboring pixel values, it replaces it with the median of those values. If the
neighborhood into account contains a good number of pixels, the typical of the 2 middle pixel values is employed.

**Median Filter**
It is a non-linear digital filtering technique, used to remove unwanted distortions from an image. Image segmentation is the process of partitioning a digital image into several segments important for further processing. Aim of segmentation is to simplify the important structure of an image into a meaningful image and easier to analyze.

**Otsu Threshold**
In image processing, the algorithm returns a single intensity threshold that separate pixels into two classes, foreground and background. But if the thing area is small compared with the background area, the histogram not exhibits bimodality. And if the variances of the thing and thus the background intensities are large compared to the mean difference, or the image is severely corrupted by additive noise, the sharp valley of the grey level histogram is degraded. Then the possibly incorrect threshold determined by Otsu's method leads to the segmentation error. (Here we define the thing size to be the ratio of the thing area to the entire image area and thus the mean difference to be the difference of the typical intensities of the thing and thus the background) Otsu's method is shown to be limited by the small object size, the small mean difference, the large variances of the thing and thus the background intensities, the huge amount of noise added, and so on.

**Gray Level Co-occurrence Method**
An image composed of pixels each with an intensity, the GLCM is a tabulation of how often different combinations of gray levels co-occur in an image or image section.

**Edge Detection**
It is an image processing technique for finding the boundaries of objects in an image. It works by detecting discontinuities of an image in brightness Edges are boundaries between different textures. Edge can also be defined as discontinuities in image intensity from one pixel to a different the sides for a picture are always the important characteristics that provide a sign for a higher frequency. Detection of edges for a picture may help for image segmentation, data compression, and also help for well matching, like image reconstruction then on. There are many methods to make edge detection. The most common method for edge detection is to calculate the differentiation of a picture. The first-order derivatives in a picture are computed using the gradient, and therefore the second-order derivatives are obtained using the Laplacian. Another method for edge detection uses Hilbert Transform. And we have proposed a replacement method called short response Hilbert transform (SRHLT) that mixes the differentiation method and therefore the Hilbert transform method.

**Canny Edge**
It is an edge detection operator that uses a multi-stage algorithm to detect a edges in images. A support vector machine (SVM) is a supervised machine learning model that uses classification algorithms for classification and regression problems.

**Histogram Analysis**
The histogram may be a summary graph showing a count of the info points falling in various ranges. The effect may be a rough approximation of the distribution of the info. The groups of knowledge are called classes, and within the context of a histogram they're referred to as bins, because one can consider them as containers that accumulate data and “fill up” at a rate adequate to the frequency of that data class. An image histogram may be a chart that shows the distribution of intensities in an indexed or intensity image.

**Support Vector Machine**
It may be supervised machine learning model that uses classification algorithms for two-group classification problems.

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**V. SOFTWARE REQUIREMENTS**

**Operating system:** Windows XP/7/8/10.

**Coding Language:** C Language

**Tool:** MATLAB R2018 - Image Processing Toolbox.

**VI. CONCLUSION**
This project focused on bird species recognition by using new feature which can improve the correct classification rate about nine percent of bird species. Integrated the new feature into the multi-scale decision tree and SVM framework. Finally the name regarding we identified the bird species.

**VII. REFERENCES**


