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Animal Identification for Zoo Using CNN

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ABSTRACT: In this paper, the Convolutional Neural Network (CNN) for the classification of the input animal images is proposed. This method is compared with well-known image recognition methods such as Principal Component Analysis, Linear Discriminant Analysis, Local Binary Patterns Histograms and Support Vector Machine (SVM). The main goal is to compare the overall recognition accuracy of the PCA, LDA, LBPH and SVM with proposed CNN method. For the experiments, the database of wild animals is created. The overall performances were obtained using different number of training images and test images. The experimental results show that the proposed method has a positive effect on overall animal recognition performance and outperforms other examined method

KEYWORDS: animal detection, python, android, etc

I. INTRODUCTION

Currently, the animal detection and recognition are still a difficult challenge and there is no unique method that provides a robust and efficient solution to all situations. Generally, the animal detection algorithms implement animal detection as a binary pattern classification task [1]. That means, that given an input image, it is divided in blocks and each block is transformed into a feature. Features from the animal that belongs to a certain class are used to train a certain.classifier. Then, when given a new input image, the classifier will be able to decide if the sample is the animal or not. The animal recognition system can be divided into the following basic applications: • Identification - compares the given animal image to all the other animals in the database and gives a ranked list of matches (one-to-N matching).

II. RELATED WORK

The image recognition algorithm (image classifier) takes the image (or a patch of the image) as input and outputs what the image contains. In other words, the output is a class label (fox, wolf, bear etc.).to minimize the effect of factors that can adversely influence the animal recognition algorithm. • The feature extraction block - in this step the features used in the recognition phase are computed. • The learning algorithm (classification) - this algorithm builds predictive model from training data that have features and class labels. These predictive models use the features learnt from the training data on the new (previously unseen) data to estimate their class labels. The output classes are discrete. Types of classification algorithms include decision trees, Support Vector Machines (SVM) and many more. Interestingly, many traditional computer vision image classification algorithms follow this pipeline (see Fig. 1), while Deep Learning based algorithms bypass the feature extraction step completely. In all our experiments, the feature extraction (PCA, LDA and LBPH) and classifications (SVM and proposed CNN) methods will be used to estimate test animal images (fox, wolf, bear, hog and deer)

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III. METHODOLOGY



Fig.1 System Architecture

A system architecture diagram is used to show the relationship between different components. Usually they are created for systems which include both hardware and software and these are represented using diagram to show the interaction between them. A novel method is proposed for animal face classification based on one of the popular convolutional neural network (CNN) features. We are using CNN, a method which can automatically extract features, learn and classify them. CNNs relatively does little pre-processing compared to other image classification algorithms. This means that the network learns the filters which were hand-engineered in previous traditional algorithms. This independence from prior knowledge and human effort in feature design is a major advantage in image classification. As shown in the above Fig 1, the following figure demonstrates the architecture of this model.



Fig.2 Block Diagram of CNN



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Algorithm:

CNN Encoder

Step 1: Dataset containing images along with reference caption is fed into thesystem

Step 2: The convolutional neural network is used a encoder which extracts image features f pixel by pixel.

Step 3: Matrix factorization is performed on the extracted pixels. The matrixis of m x n.

Step 4: Max pooling is performed on this matrix where maximum value isselected and again fixed into matrix.

Step 5: Normalization is performed where the every negative value is converted to zero. Step 6: To convert values to zero rectified linear units are used where each value is filtered and

negative value is set to zero.

Step 7: The hidden layers take the input values from the visible layers and assign the weights after calculating maximum probability



Fig.3 Step by step process

IV. CONCLUSION

This system comes under deep learning which is advanced technique at present. CNN is more suitable for image processing especially in image classification. It concludes the experimental result what which is obtained from developed system is comparatively more accurate than many procedures followed before. Image recognition and prediction is a wide concept which is very deep. Deep learning concepts can be used in this subject to get efficient results. Concept like Convolutional neural networks(CNN) can be used, which is effective in obtaining results for image identification.



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