

# A Study on Picture Recognition Using Pre-processing and Decision Making

Dr.S.Vinoth Kumar<sup>1</sup>

<sup>1</sup> Assistant Professor, Department of Computer Science and Engineering,  
Vel Tech Rangarajan Dr.Sagunthala R&D Institute of Science and Technology, Vel Nagar, Chennai,  
Tamil Nadu, India

Dr.A.Christopher Paul<sup>2</sup>

<sup>2</sup> Associate Professor, Department of Computer Science and Engineering,  
Karpagam Institute of Technology, Coimbatore, Tamil Nadu, India

Dr. H. Shaheen<sup>3</sup>

<sup>3</sup> Associate Professor, Department of Computer Science and Engineering,  
St. Peters Engineering College, Hyderabad, India

**Abstract-** Abstract should be times new roman with 9 fount single spacing. The main focused of Watermarking is developing and i Image Recognition is the idea of simulating the visual functions of human brain which uses human eyes as the source of input to recognize and make decisions on the objects it sees. This became possible with the advent of cameras and advanced processing technologies. The idea is to copy the features exactly present in the pattern, that the brain uses to recognize images [6]. The image in the real world are captured and pre-processed in the desired format and stored in large chunks of memories. This is to provide the recognition program to compare the new image taken with the ones that has been pre-processed and stored. The comparison is done at the pixel level of the image which is expressed in a matrix form. The image is compared with the data set stored at pixel level and the decisions are made recognizing the image. This picture recognition method becomes a smarter solution with the availability of more number of data sets. With large number of trail and errors the system will get familiar and intelligent providing best solution for computer and robot vision technologies.

**Keywords – Buzzword, Chunks, Recognition, Pixels**

## I. INTRODUCTION

Computer Vision has become a buzzword these days. With the growth of rapid and faster processing and communication systems and availability of vast storage resources such as cloud storage, the computer intelligence has grown to a greater extent. This era of computer intelligence makes the theories of Artificial Intelligence in Robotic vision possible these days. The computers interpret the input and the output in the form of 0's and 1's which is binary. But in case of vision the processors understand the image in the terms of pixels. The pixels are the tiny area covered on the display screen which is composed or a part of an image. Several pixels make up an image. The pixels are used so that the various colors can be addressed easily corresponding to each pixel.

## II. DATA SET

The process of image recognition is similar to that of machine learning. Data sets are the heart of image recognition. The data sets are readily available for processing or can be created easily by mining large amount of raw data from various sources. These data sets are very much essential for training the model used for recognition and for comparison for the accuracy of the image under test. The data sets are available in various formats and extensions depending upon the needs and the nature of the domain they are used in. Each data set is composed of pre-processed images of same kind which can be manipulated as required for the processes.

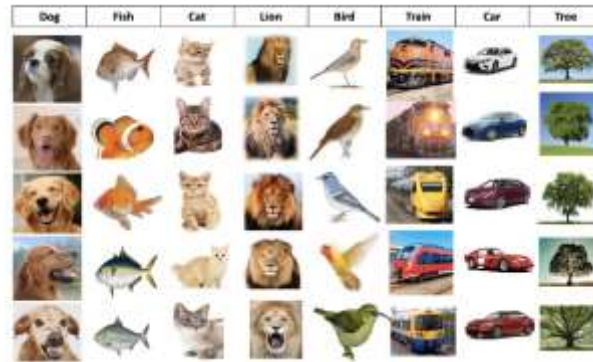


Figure 1. Data Sets

### A. Data Pre-processing

Data Pre-processing involves the extraction of raw data into the required form for recognition [7]. This data pre-processing involves resizing of images, applying filter to the images, fixing a threshold value and the point of recognition and changing the file extensions which may be easy to use in the process. Applying the threshold means setting up the end points on which the recognition is done based upon.

## III. PIXEL FEATURE EXTRACTION FROM IMAGE

The first step in picture recognition is extraction of various features from the image [6]. The characteristic features are used for marking the uniqueness of an image. These features are used for recognition if they match during the comparison. An image is composed of pixels as shown in figure 1 below and each pixel is represented by a number or a set of numbers. The range of these numbers is called the colour depth which indicates the maximum number of colours that can be used in an image. In a grey scale image which has only black and white colours, each pixel has one value ranging from 0 to 255. Nowadays, most of the images used are 24-bit colour or higher than that. An RGB colour image refers to the combination of red, green and blue ranging from 0 to 255.

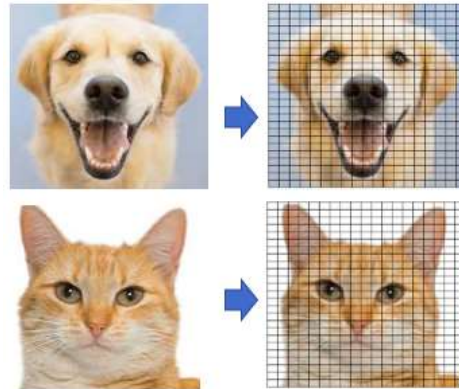


Figure 2. Pixel representation of an image

### A. Model Training

After the extraction of desired features from the data set consisting of labelled images, they can be used to train a model which is used in the process of recognition [6]. The more the images are used to train a model the more accurate the results will be after recognition. The efficiency depends upon training the model with sufficient data sets. As this is a well known data set training method, this comes under the category of supervised learning.

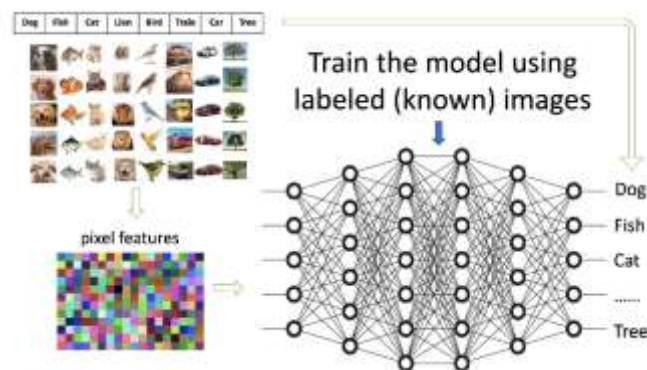


Figure 3. Data Sets for Model Training

### B. Processing and Storage

As there are several images involved there is the need for a huge data storage spaces. These needs can be satisfied with the cloud solution which gives large amount of secured storage facilities. The process involves working with large number of images which requires faster processing capabilities which would be necessary in a fast working environments. This is satisfied with systems with high speed processors or online cloud processors such as google colab, Data Scientist Workbench. These provide high processing speeds which can process large amount of data in a lesser time.

### C. Filters and Threshold

The images that were trained are applied with some filter and threshold values. This is done because the image which is directly available from various sources have different disturbances or impurities which makes the image unclear or unfit for recognition. This can be a barrier for feature-extraction process [7]. By applying a filter the image becomes pure for recognition. The filter is applied in the pixel level such that upon its application all the pixel gets changes. The threshold is a type of filtering process to apply or restrict to a certain pixels. It is like appointing a security guard at the gate who lets in if there is only permission.

### D. Recognition and Prediction

After the models are trained, classified and well formed, the recognition is done. A new raw image is captured from the source such as a camera, the image is tested for recognition with the available data sets. The model trained compares each and every pixel and finally arrives to a conclusion. Here is where the prediction is made where the result is provided on the test image. Based on the result conclusions can be made accordingly for various problems involving computer vision.

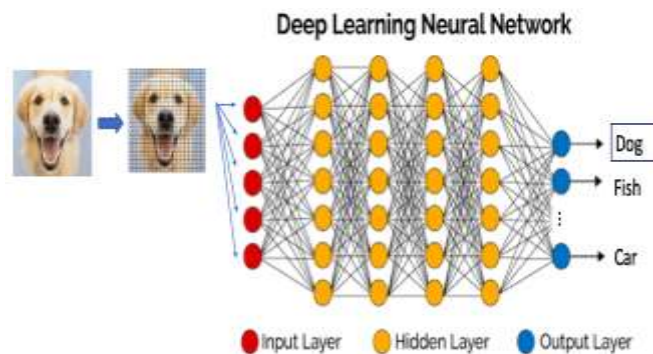


Figure 4. Recognition through Deep Learning

## IV. CONCLUSIONS

The image or pattern recognition technologies are growing at rapid rates where there is machines involved mostly. These recognition methods can be used in places where human lives could be at risk. These systems could see, fetch, extract, classify and analyze the surroundings around them and make better decisions for the betterment of the world. The modern era would mostly interpret with machine vision which would make a better companion for mankind.

## REFERENCES

- [1] U.Karthykeyan and Dr. M. Vanitha "A Study on Text Recognition Using Image Processing with Data Mining Techniques" February 2019.
- [2] Alex Krizhevsky, Ilya Sutskever and Geoffrey E. Hinton, "ImageNet Classification with Deep Convolutional Neural Networks" May 2015.
- [3] H. Lee, R. Grosse, R. Ranganath, and A.Y. Ng. Convolutional deep belief networks for scalable unsupervised learning of hierarchical representations. In Proceedings of the 26th Annual International Conference on Machine Learning, pages 609–616. ACM, 2009.
- [4] A. Krizhevsky. Learning multiple layers of features from tiny images. Master's thesis, Department of Computer Science, University of Toronto, 2009.
- [5] Kishore, P.V.V., Kishore, S.R.C. and Prasad, M.V.D., Conglomeration of hand shapes and texture information for recognizing gestures of indian sign language using feed forward neural networks. International Journal of Engineering and Technology, 5(5), pp. 3742-3756, 2013.
- [6] S.Vinoth Kumar, Dr.S.Karthik "A Text based Image Retrieval for Improving the Performance during Feature Extraction ", Australian Journal of Basic and Applied Sciences, Pages: 45-51, 2014
- [7] S.Vinoth Kumar, Dr.S.Karthik " Rule based Image Extraction for Mining Images from Databases ", Asian Journal of Research in Social Sciences and Humanities , Vol 7 Issue 1, 2017
- [8] Berg, J. Deng, and L. Fei -Fei. Large scale visual recognition challenge 2010. [www.image-net.org/challenges](http://www.image-net.org/challenges). 2010.