MANARAT INTERNATIONAL UNIVERSITY

Department of Computer Science & Engineering (CSE)

Project Report on

Neural Neural and Fuzzy System

Course code: CSE -433

Team : Null Coder

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Contents of the Project Report

1. Abstract

Object Recognition has recently become one of the most exciting fields in computer vision and AI. The ability of immediately recognizing all the objects in a scene seems to be no longer a secret of evolution. With the development of Convolutional Neural Network architectures, backed by big training data and advanced computing technology, a computer now can surpass human performance in object recognition task under some specific settings, such as face recognition. Our Project is Kaggle Cifar-10 – Object recognition in Images which is popular kaggle competition for beginner. We used different deep learning methods on data prepossessing, training process for our project. We achieved 81.00% accuracy in this project.

2. Introduction

Cifar-10 – Object recognition in Images is a kaggle competition. Kaggle is a platform for predictive modeling and analytics competitions in which statisticians and data miners compete to produce the best models for predicting and describing the datasets uploaded by companies and users. This crowd-sourcing approach relies on the fact that there are countless strategies that can be applied to any predictive modeling task and it is

impossible to know beforehand which technique or analyst will be most effective.
The CIFAR-10 dataset (Canadian Institute For Advanced Research) is a collection of images that are commonly used to train machine learning and computer algorithms. It is one of the most widely used datasets for machine learning research. The CIFAR-10 dataset contains 60,000 32x32 color images in 10 different classes. The 10 different classes represent airplanes, cars, birds, cats, deer, dogs, frogs, horses, ships, and trucks. There are 6,000 images of each class. CIFAR-10 is a set of images that can be used to teach a computer how to recognize objects. Since the images in CIFAR-10 are low-resolution (32x32).CIFAR-10 is a labeled subset of the 80 million tiny images dataset. When the dataset was created, students were paid to label all of the images.

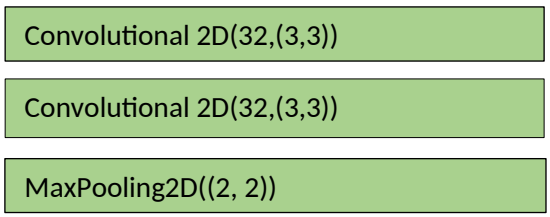
We discuss the following contents such as data prepossessing, Network architecture, training part for describing what methods use in this competition.

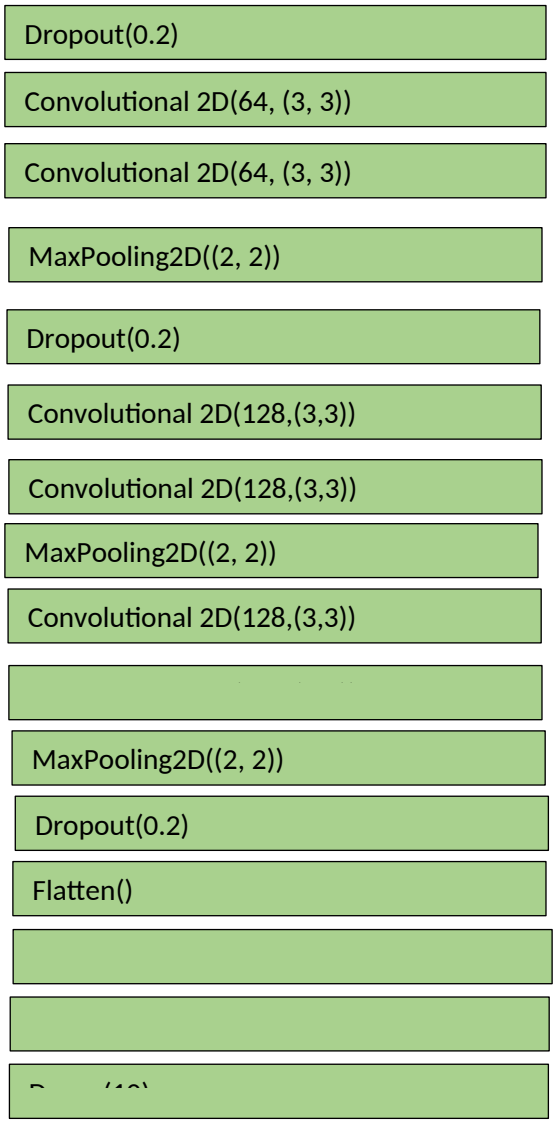
3. Data Preprocessing:

Data preprocessing is important part of object recognition in deep learning. Pre-processing refers to the transformations applied to our data before feeding it to the algorithm. Data

Preprocessing is a technique that is used to convert the raw data into a clean data set.
We know that the pixel values for each image in the dataset are unsigned integers in the range between no color and full color, or 0 and 255. A good starting point is to normalize the pixel values, e.g. rescale them to the range [0,1]. This involves first converting the data type from unsigned integers to floats, then dividing the pixel values by the maximum value which is called normalization.
We used a one hot encoding for the class element of each sample, transforming the integer into a 10 element binary vector with a 1 for the index of the class value.
Data augmentation is an integral process in deep learning, as in deep learning we need large amounts of data and in some cases it is not feasible to collect thousands or millions of images, so data augmentation comes to the rescue. We used six type of data augmentation operations such as shearing,zooming,cropping,flipping,changing the brightness level,Rotation.

4. Network architecture:





CNN:

Convolution neural networks consists of different layers. In our first network architecture, our used 2d convolution layers, activation layers, maxpooling layer and fully

connected layer.

In second and final CNN architecture, we added Batchnormalization,flatten and dropout with above network. We used he normalization weights initialization.

5. Training Procedure

In training process, we used the adam optimizer, learning rate = 0.001, and momentum = 0.9, loss = crossentropy. We used stochastic gradient decent .
For first training process, we used 70 epoc for our training the model.
For second training process, we used 150 epoc for training the model.
For third training process, we used 200 epoc for our training the model.

6. Testing Procedure

In testing process, we used 300000 images for evaluating our model. We spilt 300000 images into 6 parts for testing process.

7. Results

Model Architecture	Accuracy
Two convolutional layer with epoch=70	0.7305
Same architecture with epoch=100	0.78410
New model with batchnormalization , dataaugmentation epoch=100	0.8090
Same model with epoch= 200	0.8188

9. Conclusion

During training process in our project, we used different method for our project. We could not get good accuracy because of we started the project last time of project deadline. When we batchnormalization and data augmentation and dropout , it increased the accuracy of our model. We couldn’t achieved our expected accuracy because of we started our work later. InshaAllah next time we overcome our failure.