In the name of GOD

AIMedic Internship

2021 summer

Intro to Neural Network | Homework 2 | mojtaba nafez

CIFAR-10 Dataset Preprocess:

We need tow action:

- normalize the image, because each pixel has a value between 0-255.
- And make the label's categorical.

Data normalization is an important step which ensures that each input parameter (pixel, in this case) has a similar data distribution. This makes convergence faster while training the network

Dynamic or Static (K-Fold or Train_test_splite):

K-fold is usually used when we have small dataset.

It seems better to use Static method because we have enough data to train model

But i test a k-fold valuation on CIFAR-10 dataset, you can check it in last section of notebook.

Model Architecture and Parameters:

This section is implemented in fully detail inside notebook.

I used GridSearch to test parameters of fit function.

The description is available in the notebook.

Best Model:

The description in notebook is complete,

For overfitting we test :

1. Reduced model capacity
2. Regularization Norm L2
3. Dropout layer
4. Increase dataset(augmentation)
5. Specific model with keras functional api

Confusion matrix is draw for all model.(cat and dog are so similar and the confusion matrix shows that.)

accuracy ,precision, recall , F1 Score for each class is printed.

At the final point, the best accuracy is 58% in use dropout && augmentation.

CIFAR data is so complicated to a model of Dense layer. we need powerful layer to work on image and pay attention on local feature and locality on image.

I'm sorry about english language of the document, i will upload the notebook file in my kaggle, and prefer to have a complete notebook.

Mojtaba nafez,

Thank you.