[CIFAR10-project]

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Introduction

Image classification is a fundamental task in computer vision that involves assigning one or more class labels to an input image. Convolutional neural networks (CNN) have been widely used for image classification tasks due to their ability to capture spatial features in images. In this project, I aimed to build a CNN model that can classify images from the CIFAR-10 dataset into ten different classes: airplane, automobile, bird, cat, deer ,dog, frog, horse, ship and truck. The Cifar-10 dataset consists of 60,000 32*32 color images in the training dataset, with 5000 images per class. There are 50,000 training images and 10,000 test images.

Proposed solution

I used PyTorch to implement my CNN model for image classification. The CNN consists of three convolutional layers. The ReLU activation function is used after each convolutional and fully connected layer except for the last fully connected layer. The output of the last fully connected layer is fed into a softmax activation function,which provides the probability distribution over the ten classes.

I chose this architecture because it has been shown to perform well on Cifar-10 classification tasks and is also a relatively simple architecture to implement. The max-pooling layers help in reducing the spatial dimensions of the input, which helps in reducing the number of parameters in the model and also helps in preventing overfitting. The ReLU activation function is chosen because it has been shown to be effective in improving the performance of deep neural networks. I also used cross-entropy loss as the loss function, which is commonly used for classification tasks**.**

RESULTS

The model was performing well attaining a 'val_acc': 2.09564568102359772, 'val_loss': 0.3040597438812256,this was much satisfying.

Discussion

Convolutional networks have revolutionized computer vision,in this project,I started by loading the CIFAR-10 dataset using the pytorch library the I preprocessed the dataset by normalizing the pixel values and splitting the training and validation datasets. I created a dataloader object for each dataset which allows me to efficiently load the data in batches during training and validation, I then identified some of the characteristics of the data set and latter visualized using the make_grid helper fuction from torch vision, then I proceeded to base model class and training on gpu,the last step was training and the model and evaluation

Conclusion

In conclusion, I have successfully implemented a convolutional network using pytorch to classify images from CIFAR-10 dataset and my implementation can be used as a starting point for more complex image classification