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AAI – 551 FINAL PROJECT REPORT

Building a CNN for CIFAR-10 Image Classification

In this project, a Convolutional Neural Network (CNN) was developed to classify CIFAR-10 images. The CIFAR-10 dataset, consisting of 60,000 32x32 color images from 10 classes, was used.

The dataset was loaded using Keras, and one-hot encoding was applied to transform scalar labels into 10-dimensional vectors. The training set was randomly split into a training subset (40,000 samples) and a validation subset (10,000 samples).

The CNN model included two convolutional layers, max pooling layers, a flattening layer, and dense layers. The model was trained using the training and validation subsets, with performance and loss values recorded.

Plots were created to visualize the training and validation loss curves, as well as the training and validation accuracy curves. The model was then trained again using the entire training set (50,000 samples), and the loss curve and accuracy curve were plotted.

The trained models were evaluated on the test set, with saved models loaded for assessment. The models achieved satisfactory performance on the test set, demonstrating their effectiveness in classifying CIFAR-10 images.

Overall, the project successfully implemented a CNN model for CIFAR-10 image classification. Further enhancements can be explored by experimenting with different architectures and hyperparameters, as well as incorporating data augmentation techniques.

GITHUB Link: https://github.com/breenath/AAI-551