CIFAR-10 Image Recognition

EE4305 Introduction to Fuzzy/Neural Systems

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1 Introduction

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The CIFAR-10 dataset contains 60000 images bla bla.[?]
Objectives of this project are: bla bla
Structure of the report is as follows: bla bla

2 Literature Review on Neural Networks

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This literature review is on the broad topic of neural networks. Section 3 gives a more specific review on neural network designed to classify the CIFAR-10 dataset.

2.1 Significance and Applications of Neural Networks

2.2 Recent Trends and Accomplishments

3 Literature Review on the CIFAR-10 dataset

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4 MLP Classifier

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4.1 Data Preprocessing and Augmentation

- Normalization

  The input data is normalized to lie within the range [0,1].

- Mean subtraction

  To further normalize the data, a the mean is subtracted on a per-pixel basis.

- Data augmentation

  Experience shows that a larger training data set increases network performance

4.2 Network Structure

- Basic structure

  Since this is a classification problem, parts of the network structure are fixed. The last layer consists of 10 nodes and a in a ”softmax” configuration. PICTURE of basic structure.

- Number of hidden layers/nodes

  Parameter search over 1-3 hidden layers, 1-500 neurons

4.3 Optimization of Further Network Parameters

- Different learning rates
- Different optimization methods

5 CNN network

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6 Conclusion

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