CIFAR-10 Image Recognition

EE4305 Introduction to Fuzzy/Neural Systems

Mario Gini
Thomas Hayden

Contents

1 Introduction

T. HAYDEN

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

M. GINI

The literature review concentrates mainly on CNN networks. State-of-the-art architectures for CIFAR-10
- Advantages and disadvantages of the architectures.

-Application areas of the architectures

Advanced optimization methods to mention:
-Dropout
-Batch normalization

3 MLP Classifier

M. GINI

3.1 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

3.2 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

3.3 Optimization of Further Network Parameters

- Different learning rates
- Different optimization methods

4 CNN network

M. GINI

5 Conclusion

M. GINI