Comparison of Multiclass Kernel Support Vector Machines and Neural Networks for Image Classification

Kernel-based Machine Learning and Multivariate Modeling - project

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Contents

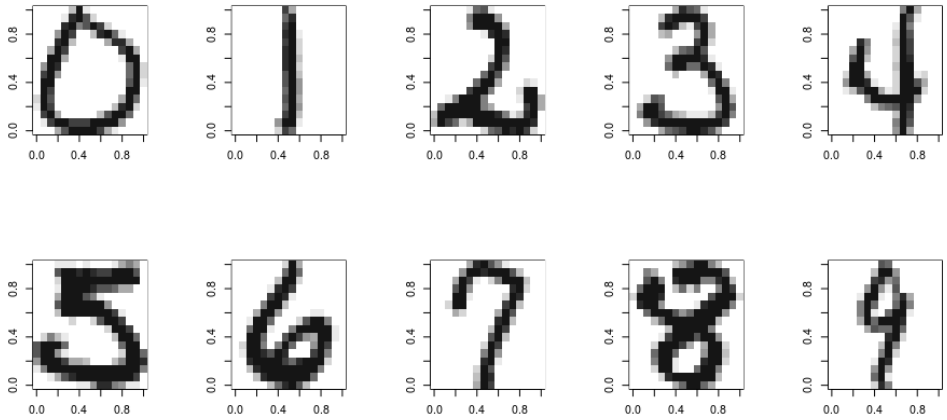


Figure 1: Example images of the 10 classes of the ZIP dataset.

1 Introduction

1.1 Task

1.2 Datasets

1.2.1 ZIP

1.2.2 MNIST

1.2.3 CIFAR10

2 Neural Networks

2.1 architectures

All the network architectures are inspired by [LeCun et al., 1998].

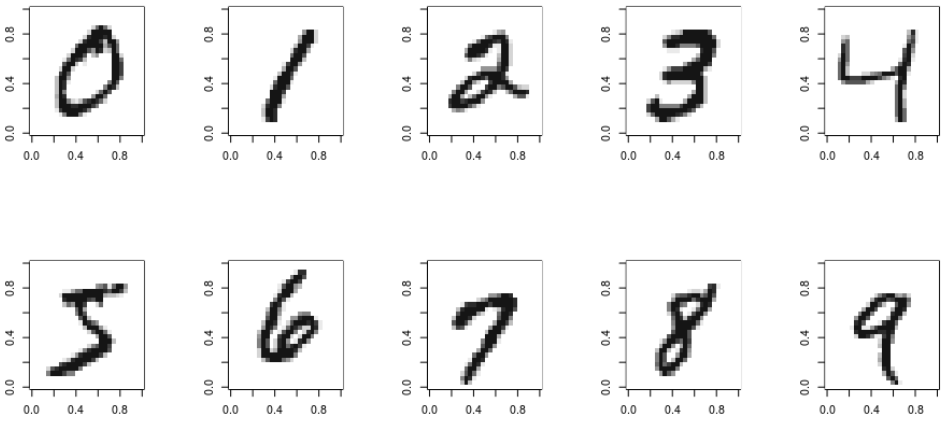


Figure 2: Example images of the 10 classes of the MNIST dataset.

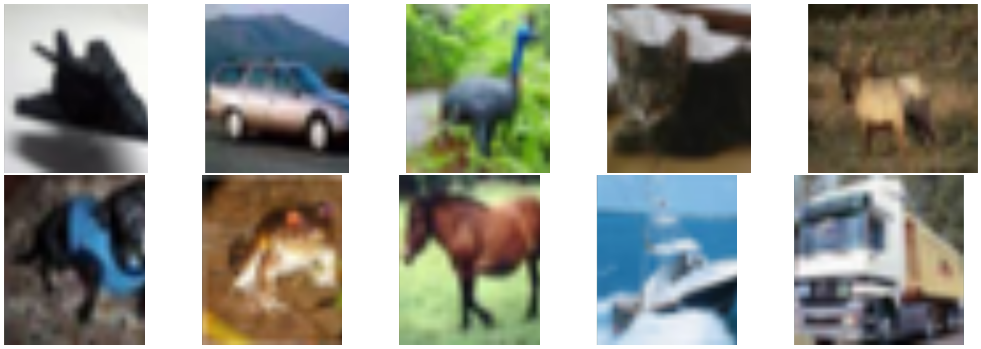
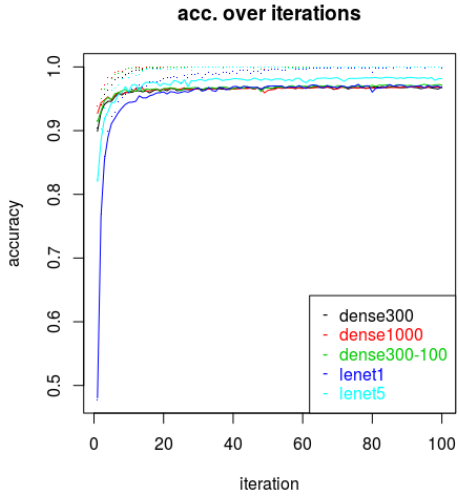
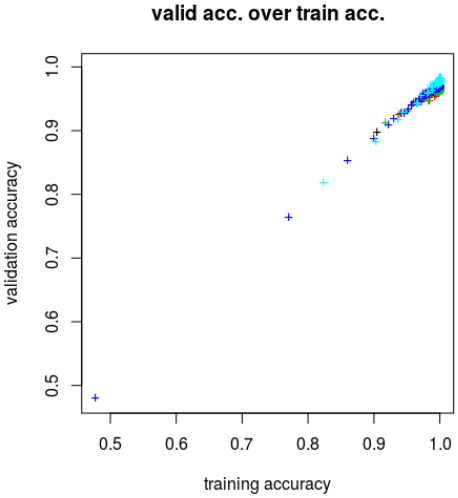


Figure 3: Example images for the 10 classes of the CIFAR10 dataset.

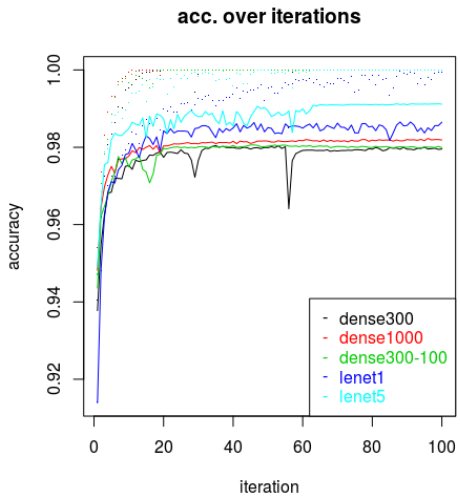
2.2 results

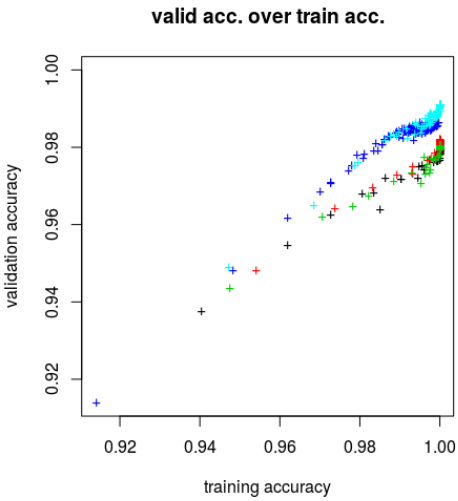
ZIP dataset

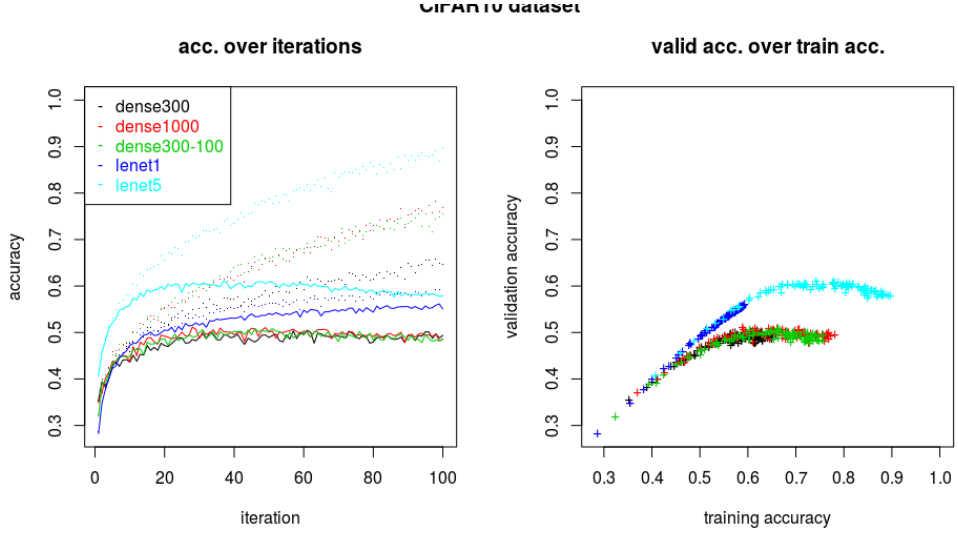




MNIST dataset







2.3 state of the art

3 Multiclass Kernel SVMs

3.1 Multiclass SVM strategies

3.2 Parameter optimization

3.3 Results

4 Conclusions

4.1 Difficulties of the datasets

4.2 Comparison of Neural Networks and SVMs

5 Application

5.1 Description

5.2 Manual

References

[LeCun et al., 1998] Y. LeCun, L. Bottou, Y. Bengio, P. Haffner, *Gradient-Based Learning Applied to Document Recognition*, Proc. of the IEEE, November 1998.