CNN MODEL

For German Traffic Dataset and CIFAR

01 INTRODUCTION

02 GERMAN TRAFFIC DATASET

03 CIFAR DATASET

PROCEDURE

We tried with simple CNN models

We started using ResNet, as the state of the art in networks. (worst performance)

Finally decided to use **AlexNet**.

ALEXNET

Size Reduction

We reduced the size of the network, removing intermediate layers.

Different activation function

We used LeakyRelu instead of RELU for the first model and ELU for the second.

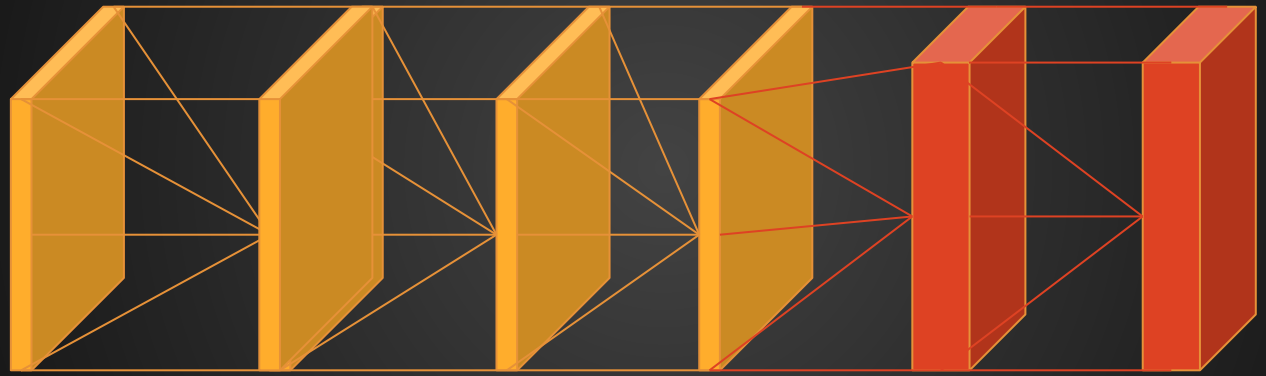
Data augmentation

We used the data augmentation capabilities with Keras.

01. German traffic DATASET

SELECTED ARCHITECTURE

Adam optimizer
Epochs: 20 (100 steps / epoch)



Conv 2D
512
Kernel: 11x11
LeakyRELU
MaxPooling 3x3

Conv 2D
256
Kernel: 5x5
LeakyRELU
MaxPooling 3x3

Conv 2D
256
Kernel: 3x3
LeakyRELU

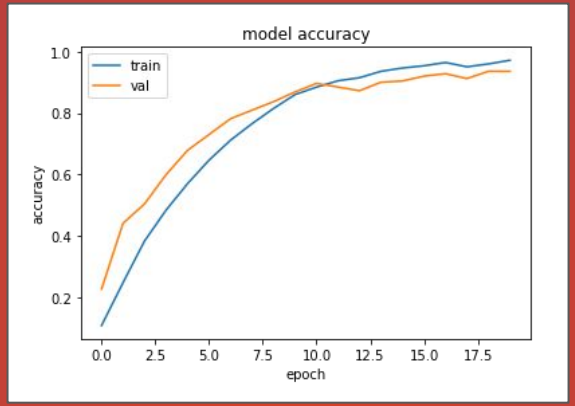
Conv 2D
128
Kernel: 3x3
LeakyRELU
MaxPooling 3x3

Dense
1028
LeakyRELU
Dropout 0.5

Dense
1028
LeakyRELU
Dropout 0.5

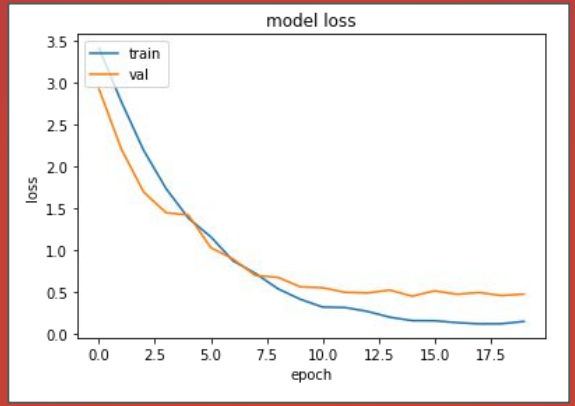
RESULTS

ACCURACY



0.9667

LOSS

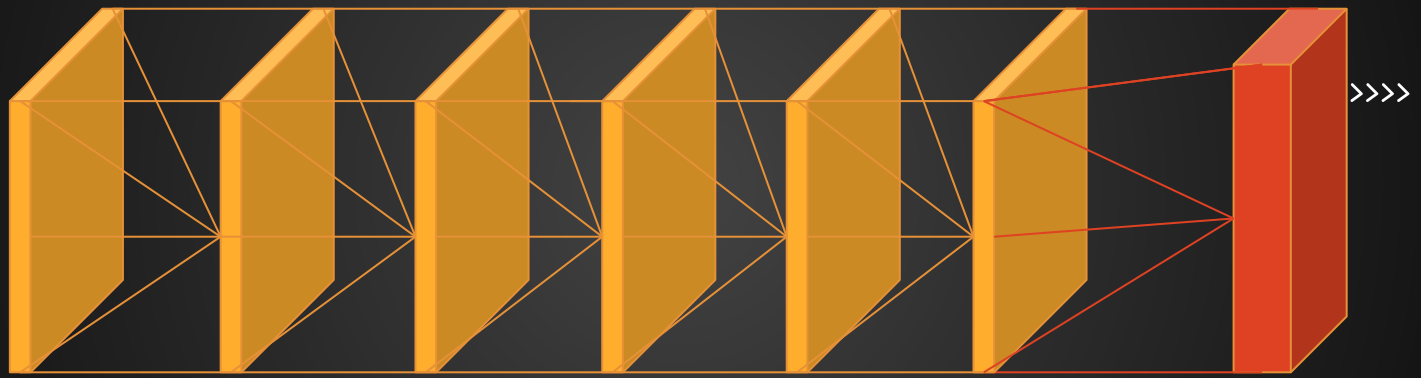


0.1441

02. CIFAR DATASET

SELECTED ARCHITECTURE

Adam optimizer
Epochs: 20 (100 steps / epoch)



Conv 2D
32
Kernel: 3x3
ELU

Conv 2D
32
Kernel: 3x3
ELU
MaxPooling 2x2
Dropout 0.5

Conv 2D
64
Kernel: 3x3
ELU

Conv 2D
64
Kernel: 3x3
ELU
MaxPooling 2x2
Dropout 0.5

Conv 2D
128
Kernel: 3x3
ELU

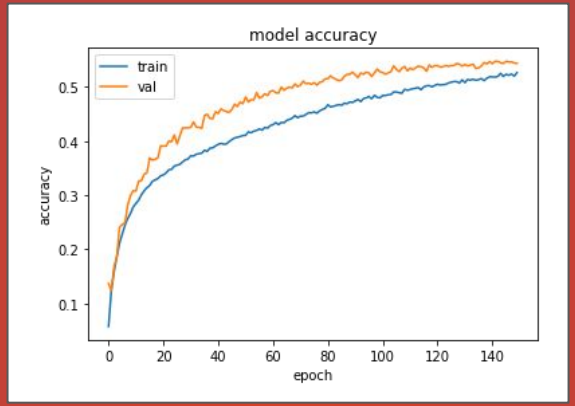
Conv 2D
128
- Kernel: 3x3

ELU
MaxPooling 2x2
Dropout 0.5

Dense
1028
ELU
Dropout 0.55

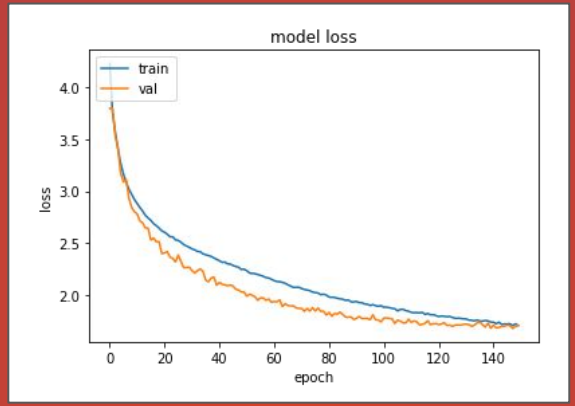
RESULTS

ACCURACY



0.5502

LOSS



1.6939

REFERENCES

- Krizhevsky, Alex, et al. «ImageNet Classification with Deep Convolutional Neural Networks»
- He, Kaiming, et al. «Deep Residual Learning for Image Recognition»
- https://keras.io/

THANKS!

Does anyone have any questions?

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