La Plateforme

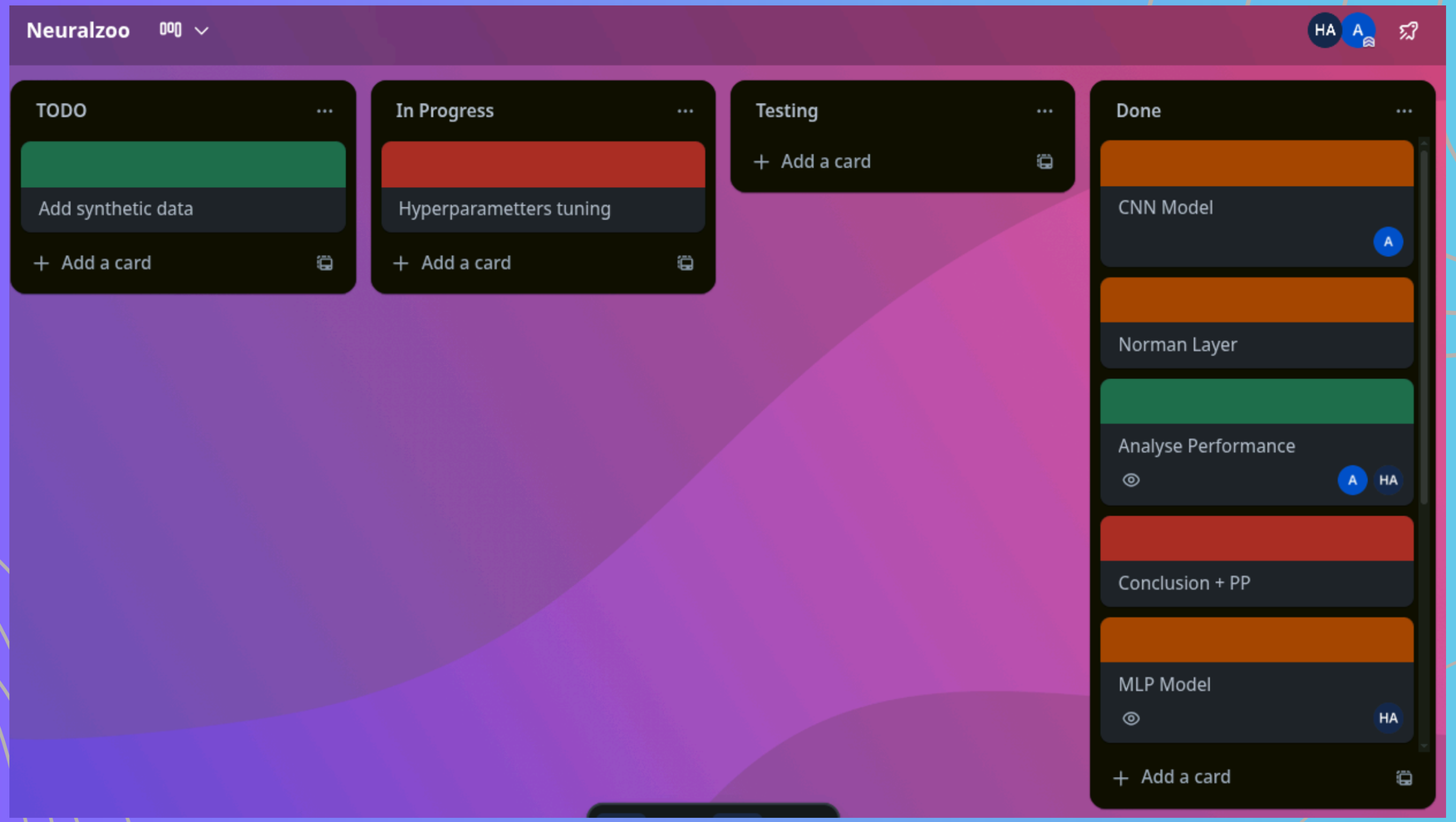
Neural Zoo

Presented by ASSAD, ANDRIAMAROMANANA

Overview

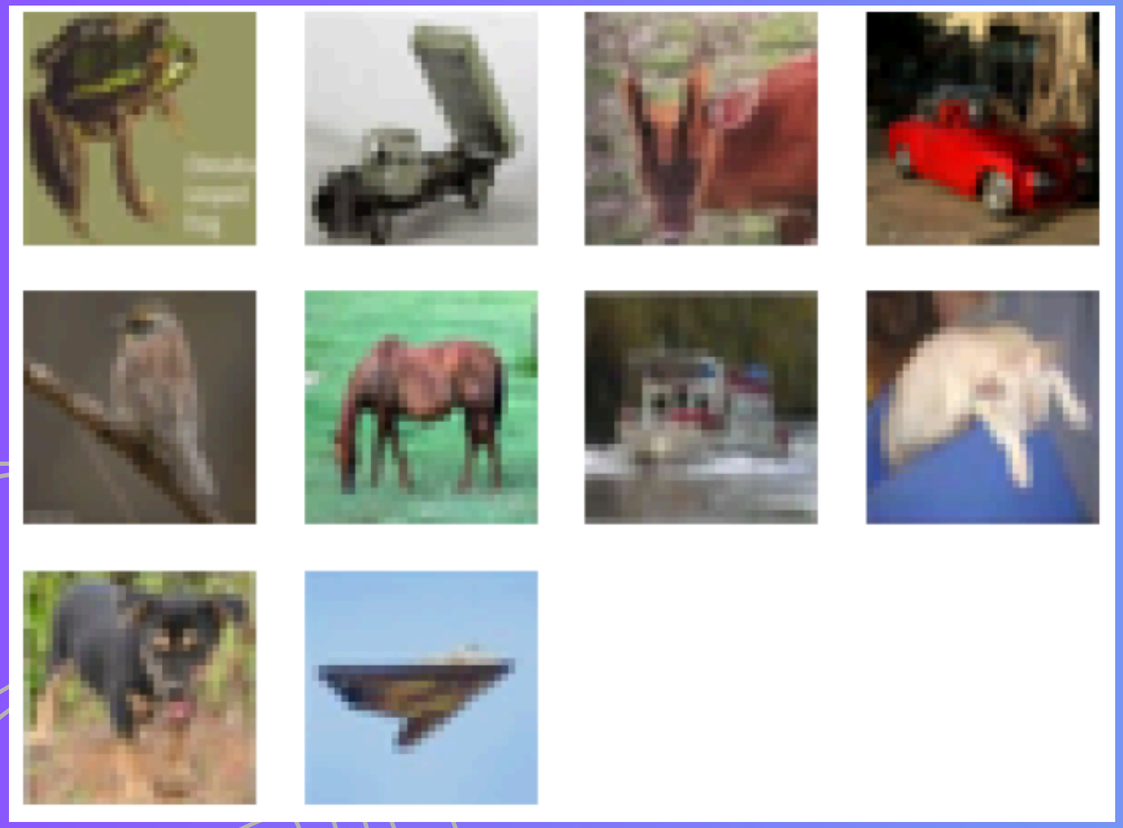
Introduction

Organisation



Exploration & Analysis

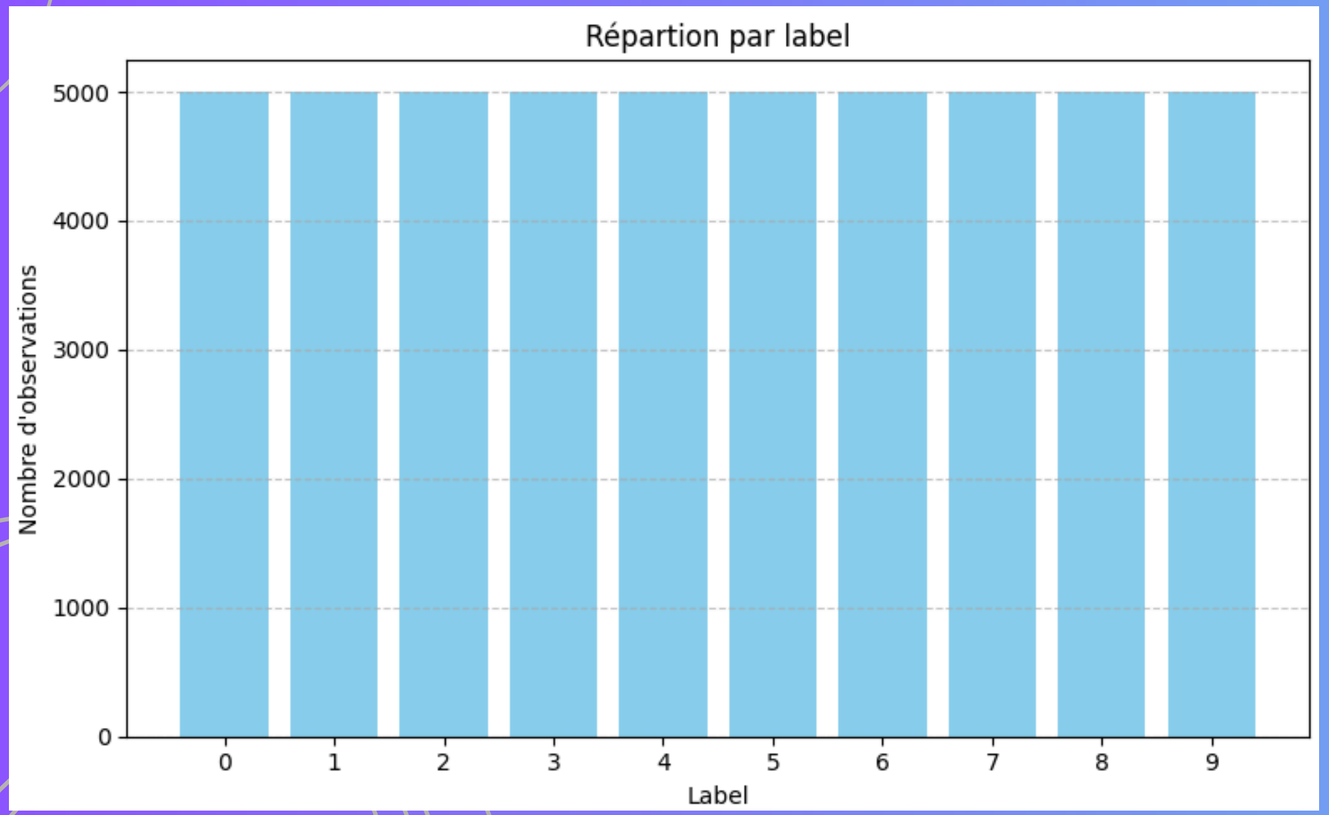
Ciphar10



Sample of 10k images

5k of each type

perfectly balanced

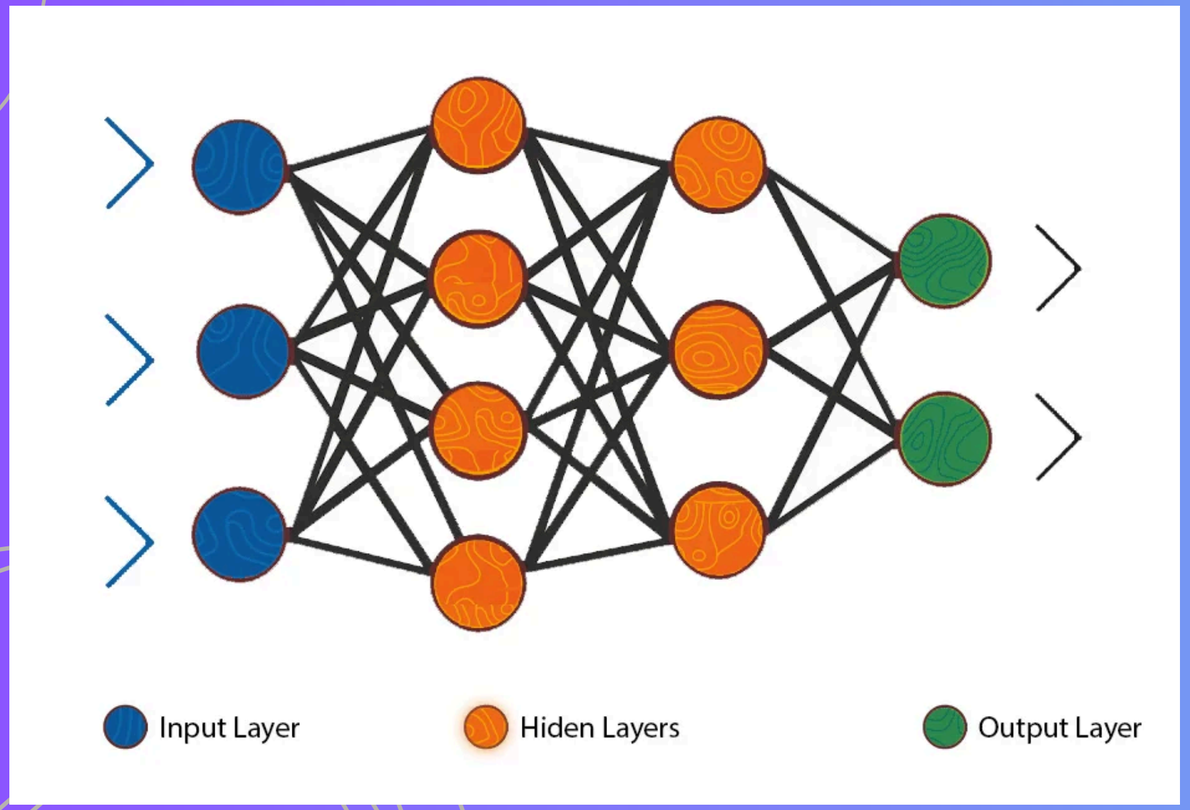


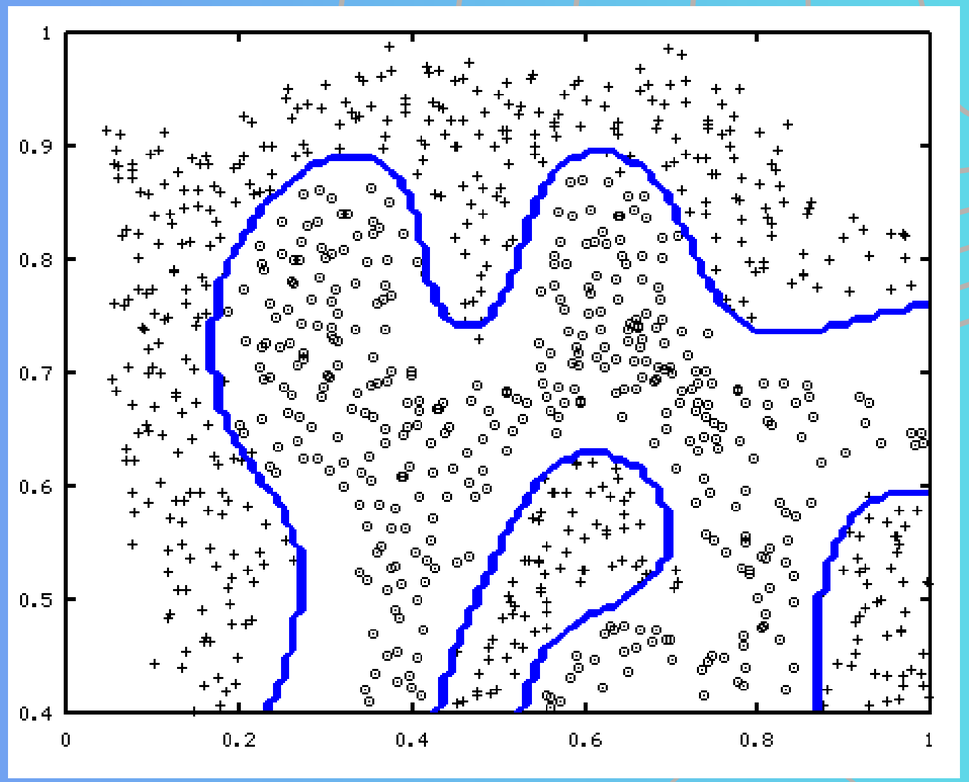
Data Preparation

- One hot encoding the labels
- Transformed images that were 3D arrays into a 1D vector
- Transformed RGB values to scalar (Normalization)

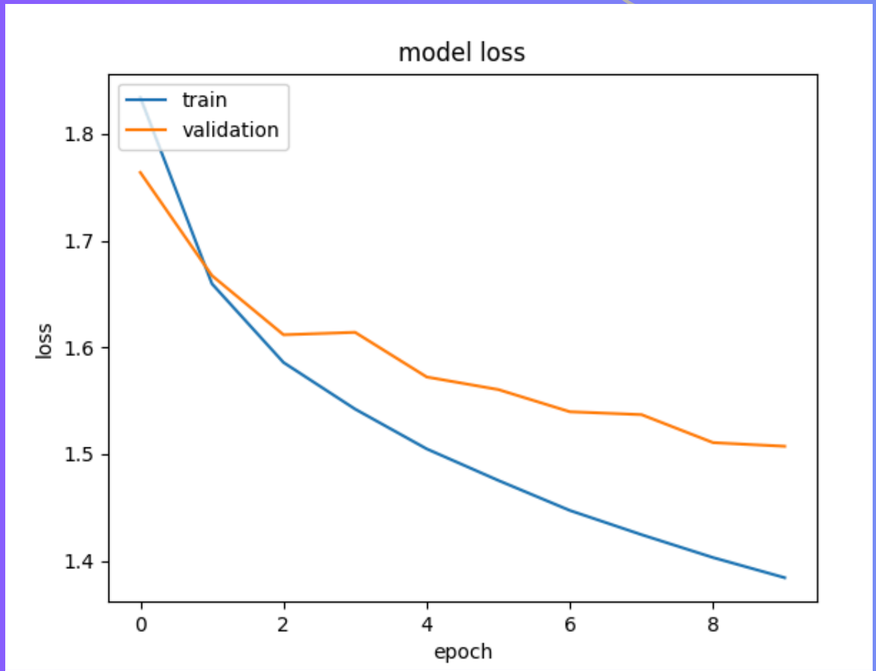
Multi Layer Perceptron

History and uses cases

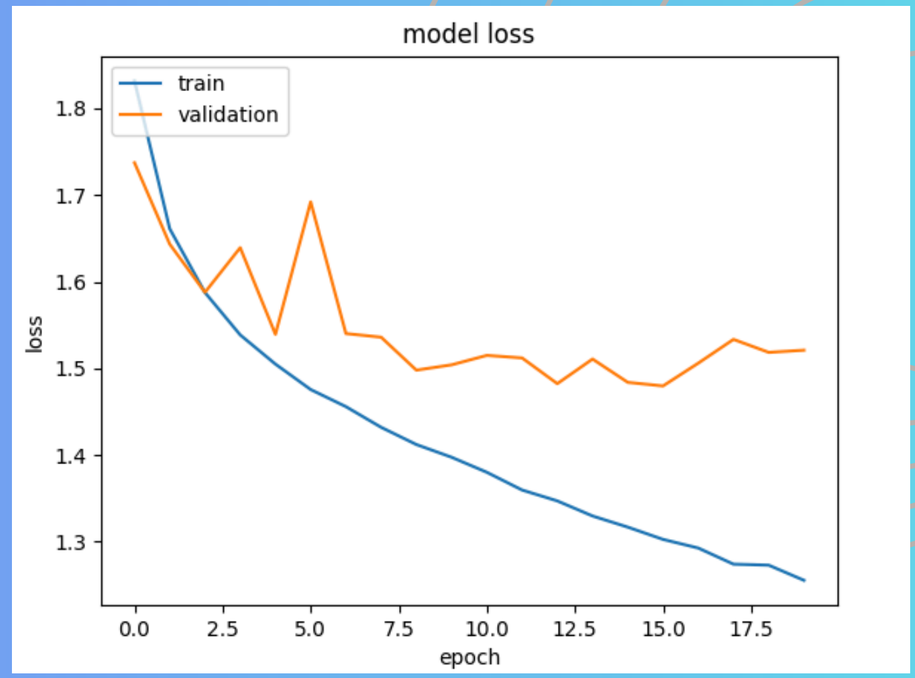




10 epochs then 20 epochs for 2 ReLU hidden layers




```
Confusion matrix:
[[492  26 104  24  46   6  34  14 200  54]
 [ 37 570  45  27  36  13  20  17  89 146]
 [ 59  11 456  73 133  44 134  54  24  12]
 [ 36  17 132 298  93 127 163  56  35  43]
 [ 43   6 203  48 427  21 138  67  35  12]
 [ 22  11 127 228  73 295 120  65  36  23]
 [ 15  14  88  64  94  23 657  22  11  12]
 [ 40  19 110  53 111  51  33 505  19  59]
 [ 62  56  37  22  43  13  17  11 689  50]
 [ 43 165  28  34  15  15  27  37  86 550]]
Accuracy: 0.4939
Precision: 0.5005
Recall: 0.4939
F1 Score: 0.4911
```




```
Confusion matrix:
[[492  26 104  24  46   6  34  14 200  54]
 [ 37 570  45  27  36  13  20  17  89 146]
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```
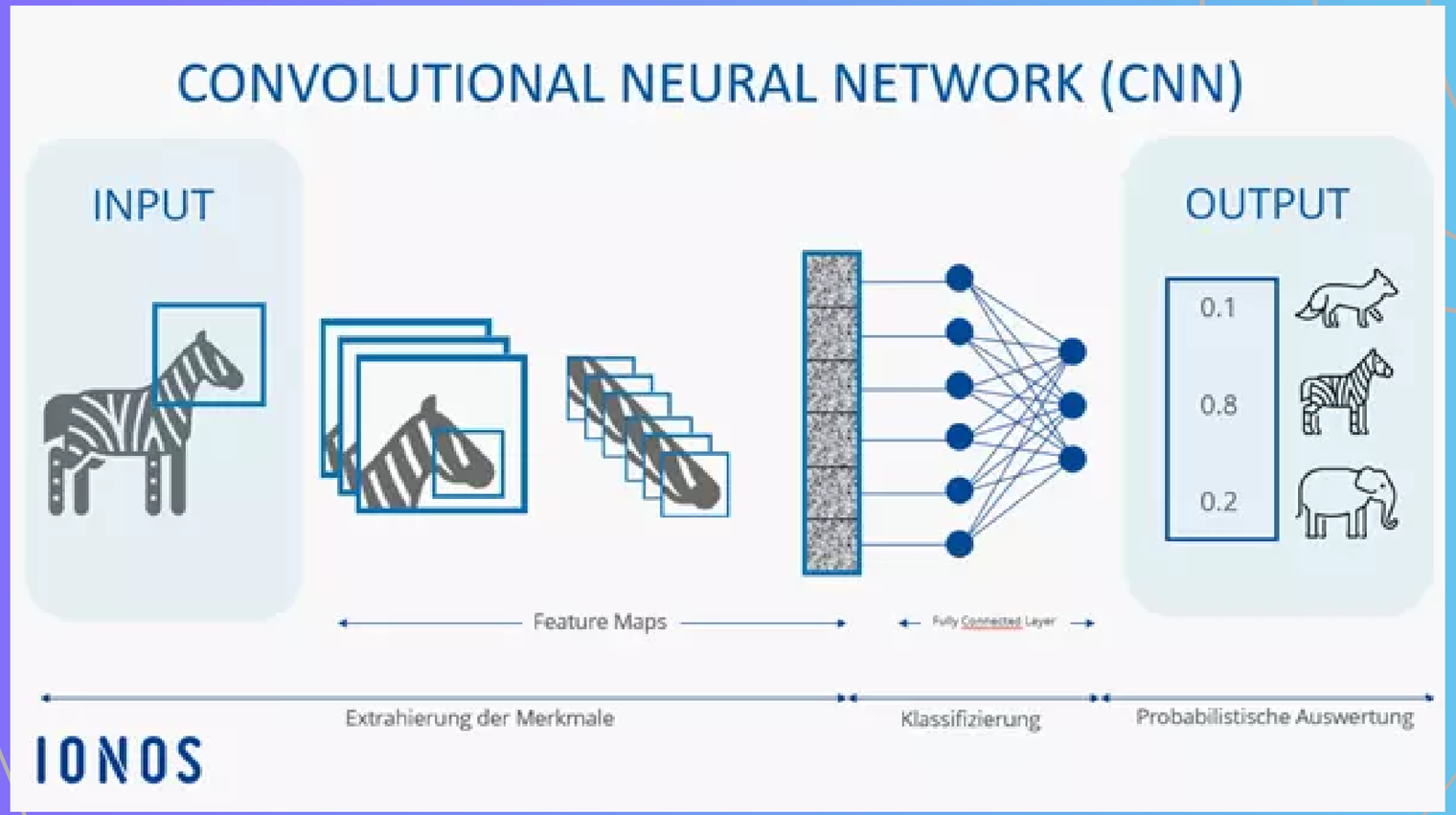

Convolutional neural network (CNN)

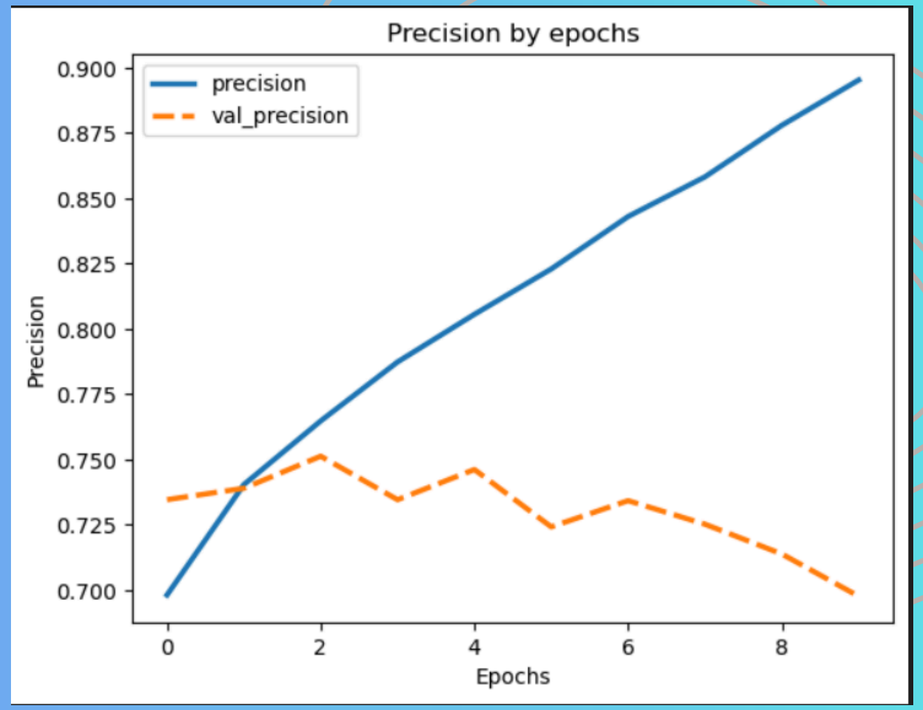
History and uses cases

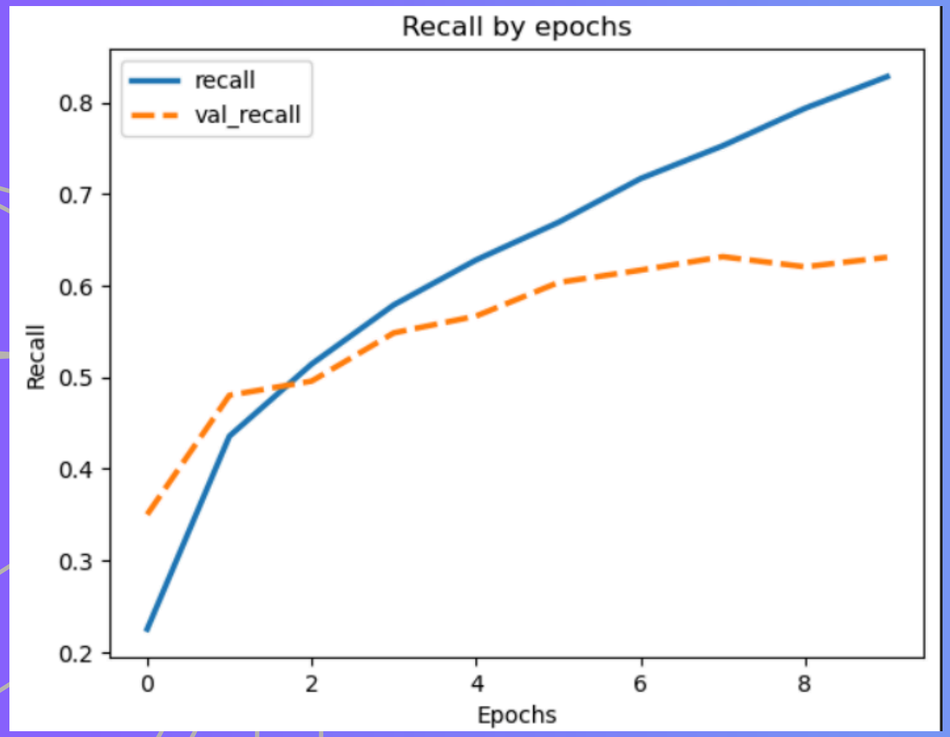


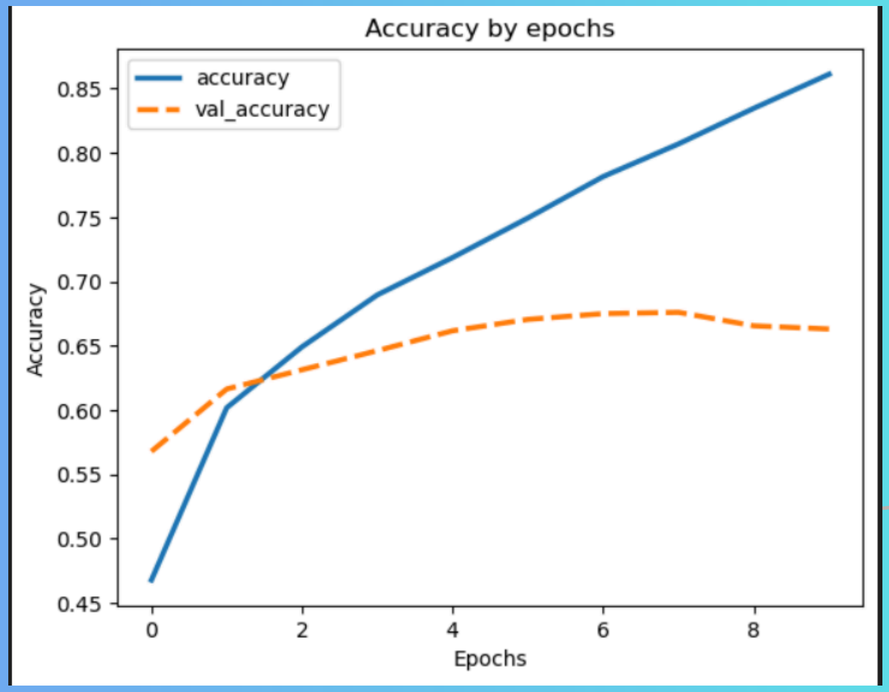
Summary

```
Model: "sequential_1"
_________________________________________________________________
 Layer (type)                Output Shape              Param #
=================================================================
 conv2d_2 (Conv2D)           (None, 30, 30, 32)        896

 max_pooling2d_2 (MaxPooling  (None, 15, 15, 32)       0
 2D)

 conv2d_3 (Conv2D)           (None, 13, 13, 64)        18496

 max_pooling2d_3 (MaxPooling  (None, 6, 6, 64)         0
 2D)

 flatten_1 (Flatten)         (None, 2304)              0

 dense_2 (Dense)             (None, 128)               295040

 dense_3 (Dense)             (None, 6)                 774

=================================================================
Total params: 315,206
Trainable params: 315,206
Non-trainable params: 0
_________________________________________________________________
None
```

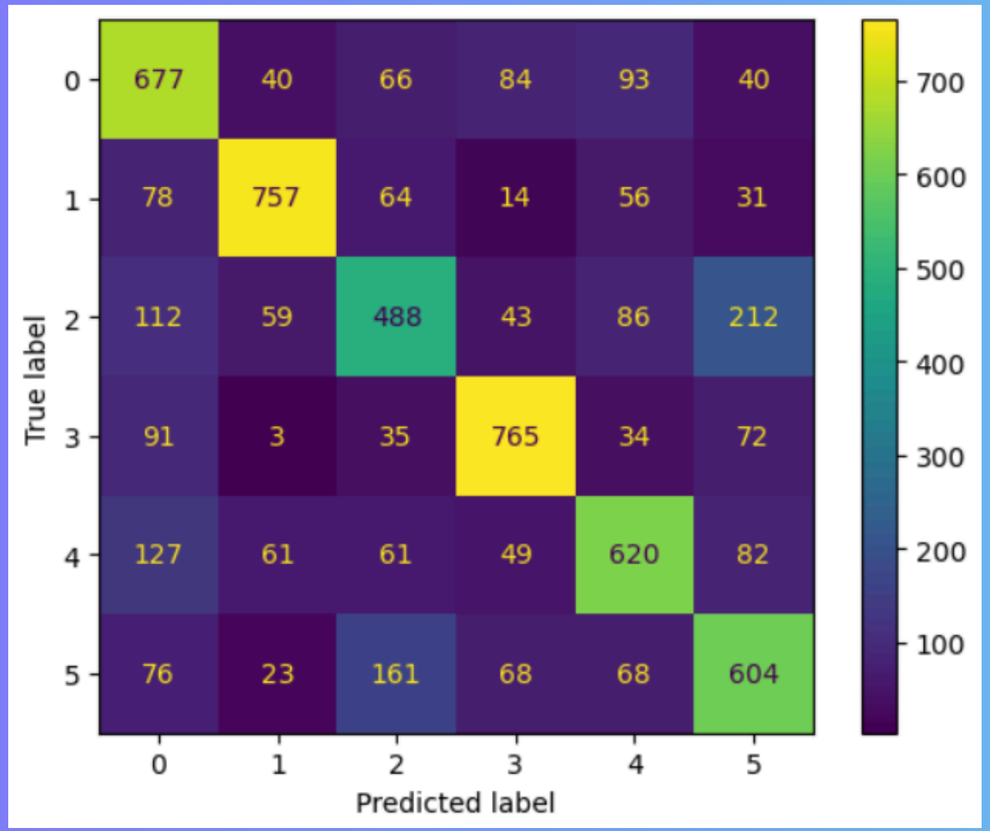
EPOCH


Precision by epochs
precision
val_precision
Precision
Epochs
0.900
0.875
0.850
0.825
0.800
0.775
0.750
0.725
0.700
0
2
4
6
8


Recall by epochs
recall
val_recall
Recall
Epochs
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0
2
4
6
8


Accuracy by epochs
accuracy
val_accuracy
Accuracy
Epochs
0.85
0.80
0.75
0.70
0.65
0.60
0.55
0.50
0.45
0
2
4
6
8

Results



Confusion matrix heatmap

```
La moyenne par label : 0.6518333333333334
La précision par label: [0.583118   0.80275716 0.55771429 0.74780059 0.64785789 0.58021134]
La sensibilité par label : [0.677 0.757 0.488 0.765 0.62  0.604]
La moyenne harmonique par label : [0.62656178 0.77920741 0.52053333 0.75630252 0.63362289 0.59186673]
```

Conclusion