SPORT Classification

Here we go 🚨:
Oscar & Viktor

01

Data Set Augmentation

TIMELINE

STEP 1

The data

STEP 2

Benchmark model

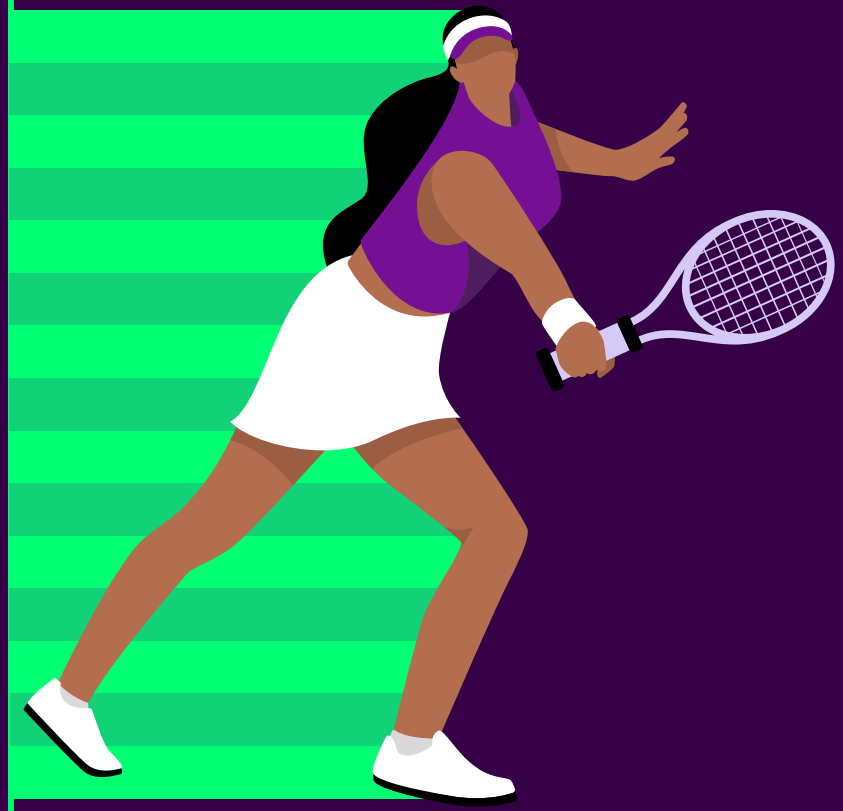
STEP 3

Manipulate the data

STEP 4

Compare

The data set



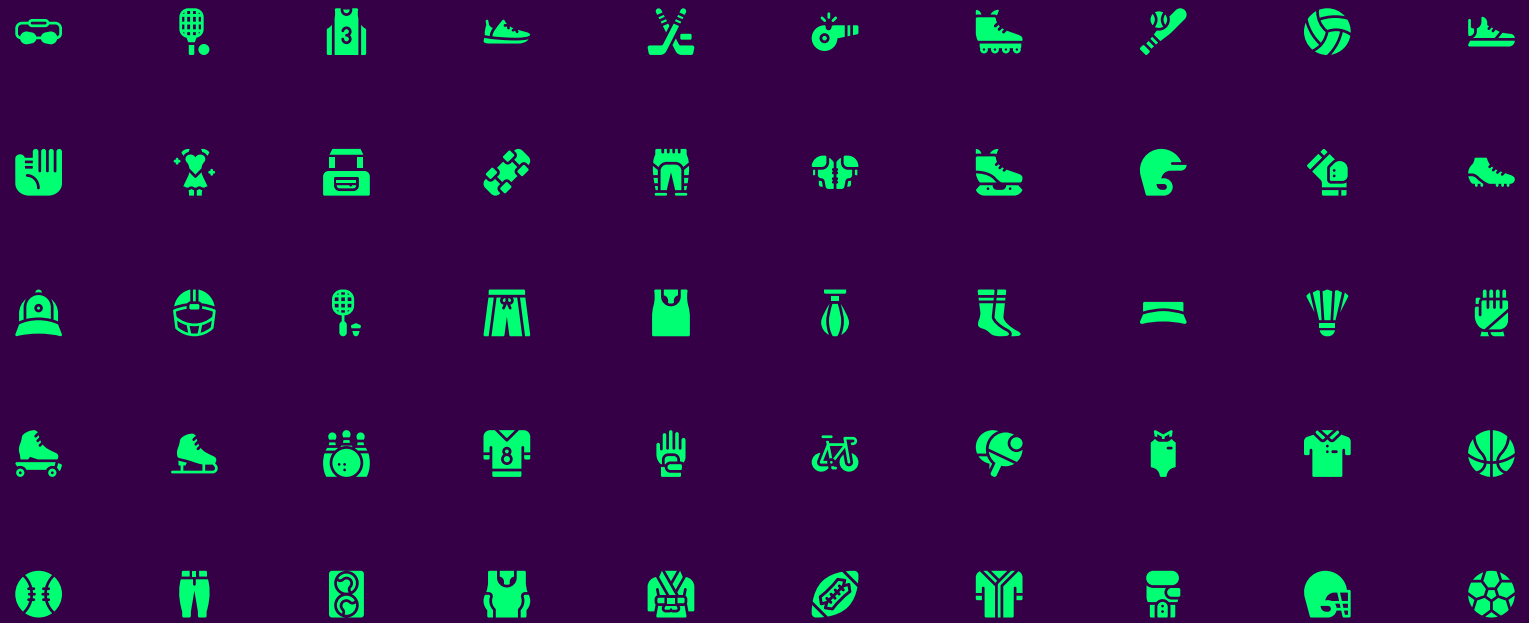
13 493
Trainable images

100
Classes

500
Test images

500
Validation images

Examples of Sports



Base Model Architecture

EfficientNetB0

A pre-trained model on the famous ImageNet data set

Transfer Learning

Layers

Freezing of the layers

Get weights

Add custom layers for our specific task

Compile

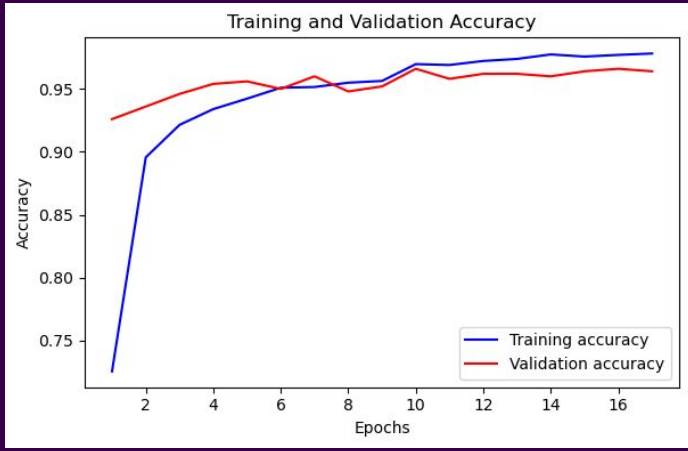
Cross entropy

Adam

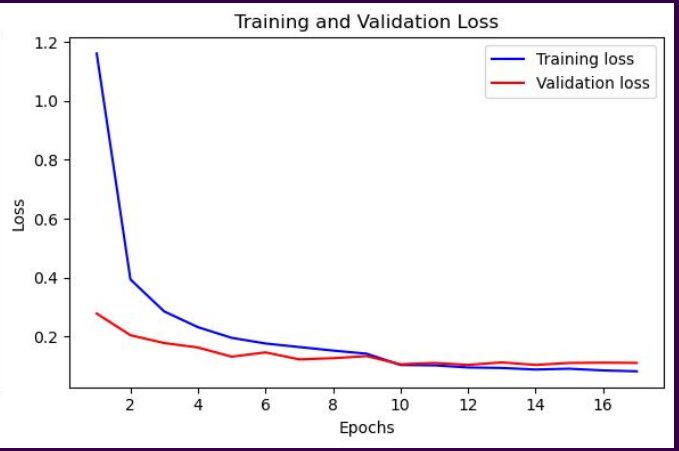
Early stop

Base Model Evaluation

Accuracy



Loss



Test Metrics: 98% 0.0614

Classes with the lowest metrics

	Precision	Recall	F1 Score
Field hockey	0.83	1	0.91
Motorcycle racing	0.83	1	0.91
Rings	0.83	1	0.91
Sky surfing	0.83	1	0.91
Giant slalom	0.83	1	0.91
Sailboat racing	0.83	1	0.91

In total 10 classes had a Precision lower then 1

Three Augmentations

Translation

A translation is a function that moves every point with a constant distance in a specified direction

Rotation

Rotation is a circular transformation around a point or an axis

Scaling

Scaling is a linear transformation that enlarges or shrinks objects by a scale factor that is the same in all directions

Why Manipulate the Data

- More data to train the model on
- Recognize patterns and features, more robustly
- Less sensible
- Increase the diversity
- Improving its generalization capabilities

Limitations

- Alter the meaning or semantics of an image
- Requires more time & computational cost
- Potential for introducing noise
- If the original dataset has biases
- Our data set is already diverse & big

Translation

30%

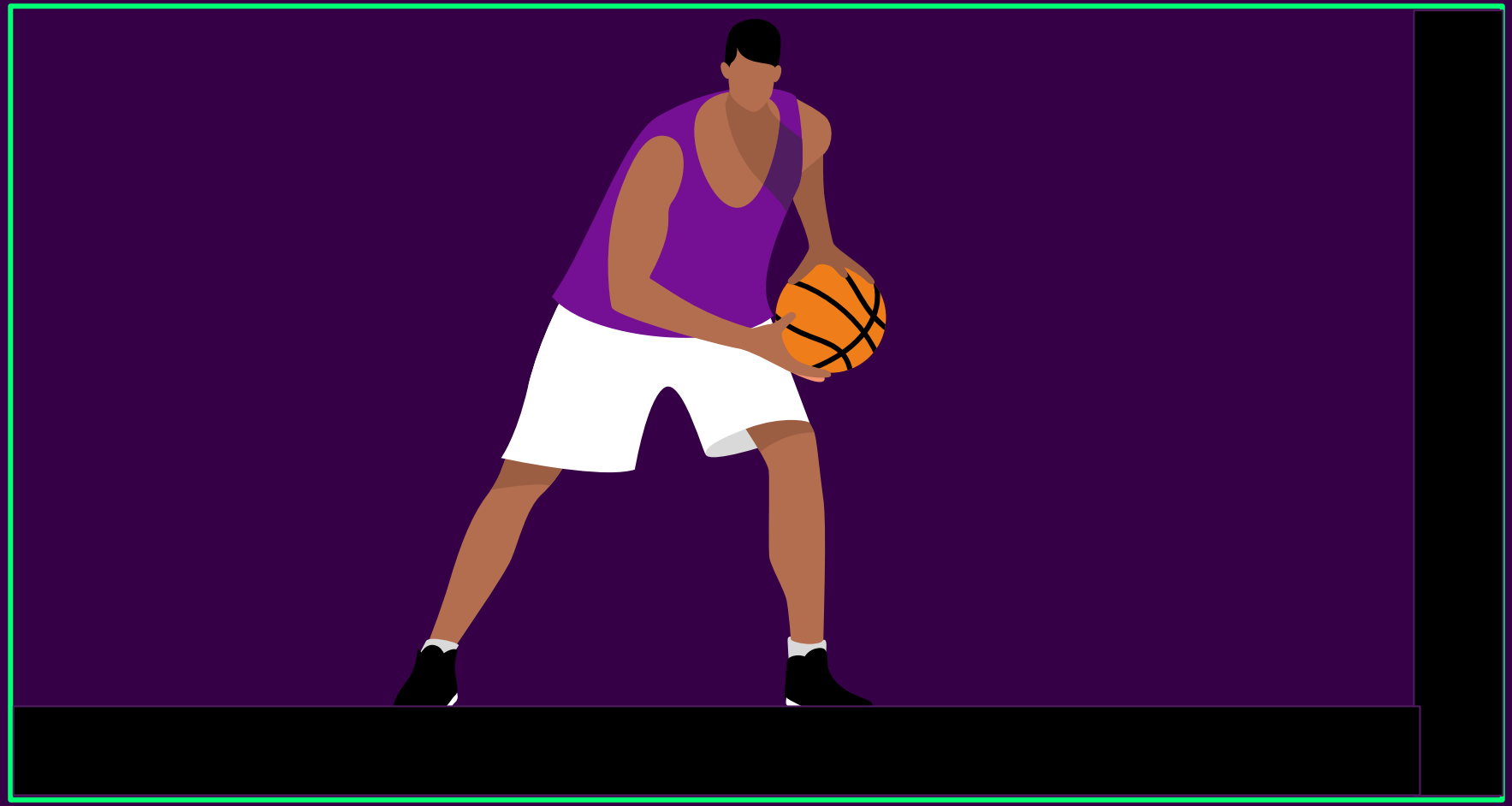
More images

Moved up

30 pixels

Moved left

30 pixels



Rotation

30%

More images

Rotated

90°

Scaling

30%

More images

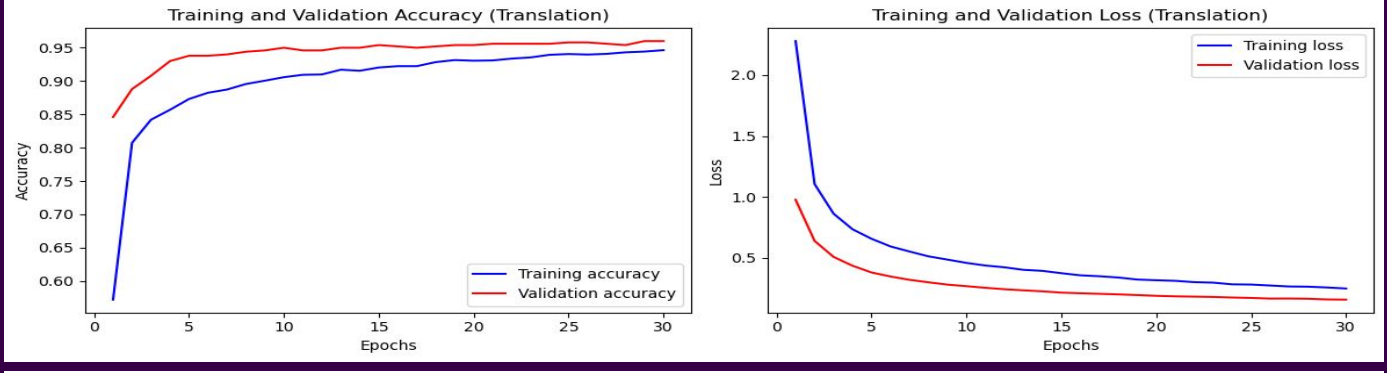
Zoomed in

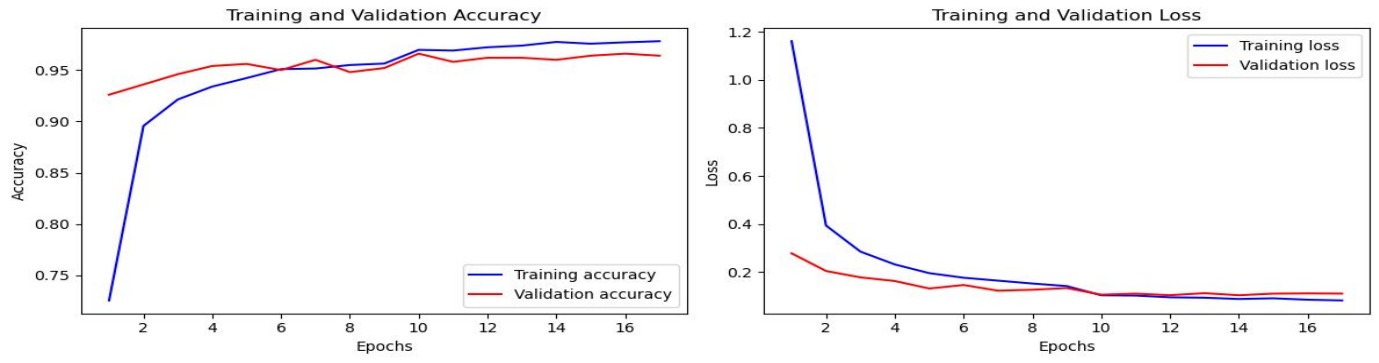
3.5x

Comparison

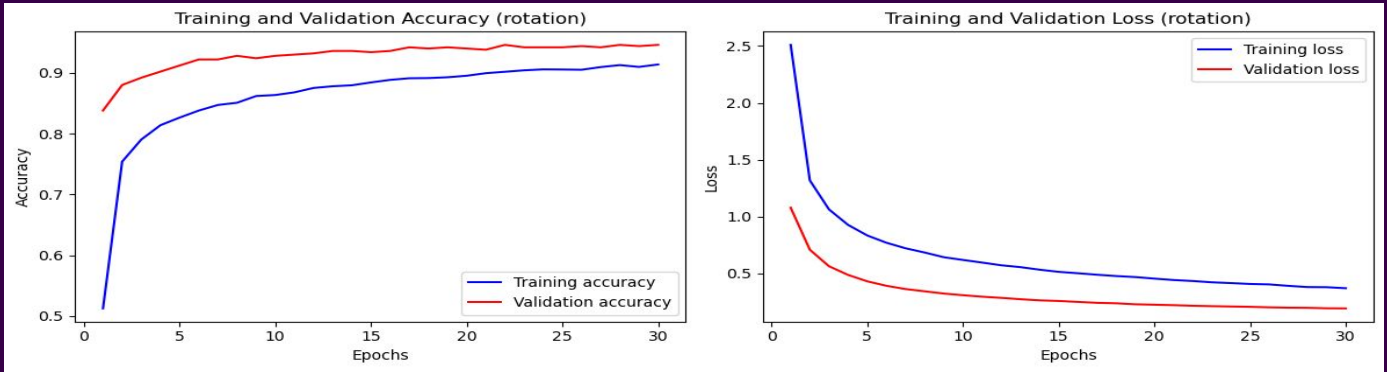
	Test Accuracy	Test Loss	Number Of Epochs	Time (min)
Benchmark	98.0%	0.0614	17	103
Translation	97.6%	0.1168	30 (max)	157.5
Rotation	97.2%	0.1543	30 (max)	147.5
Scale	97.8%	0.0723	20	104.3

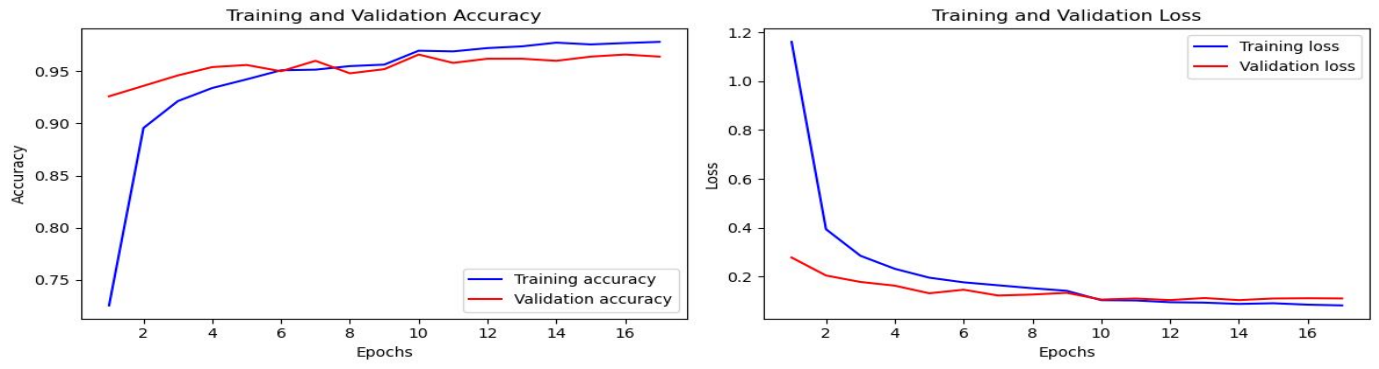
Translation



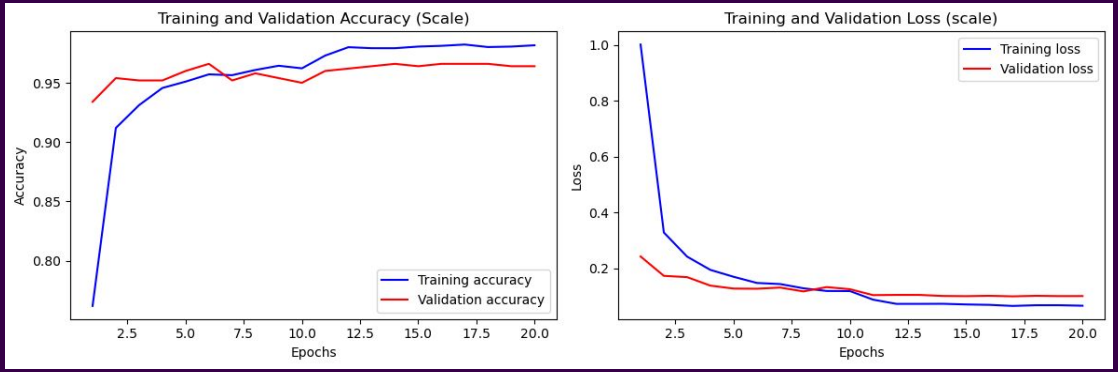


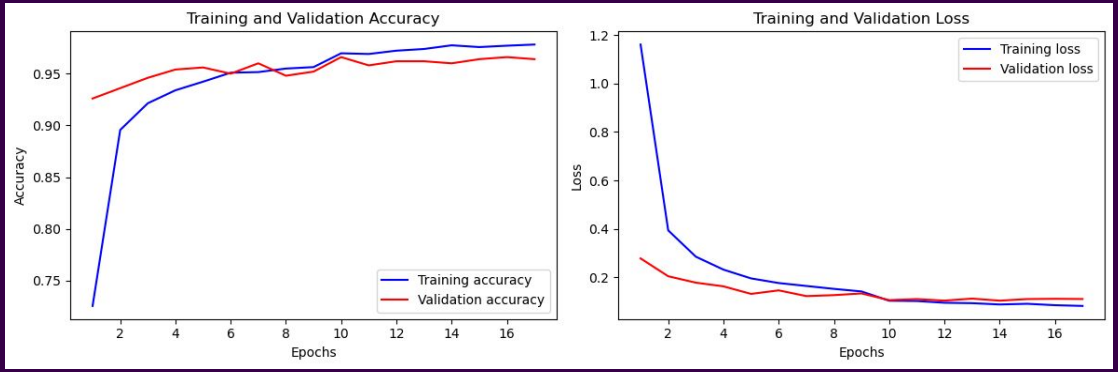
Rotation


Training and Validation Accuracy (rotation)
Accuracy
Epochs
Training accuracy
Validation accuracy
Training and Validation Loss (rotation)
Loss
Epochs
Training loss
Validation loss


Training and Validation Accuracy
Accuracy
Epochs
Training accuracy
Validation accuracy
Training and Validation Loss
Loss
Epochs
Training loss
Validation loss

Scaling


Training and Validation Accuracy (Scale)
Accuracy
Epochs
Training accuracy
Validation accuracy
Training and Validation Loss (scale)
Loss
Epochs
Training loss
Validation loss


Training and Validation Accuracy
Accuracy
Epochs
Training accuracy
Validation accuracy
Training and Validation Loss
Loss
Epochs
Training loss
Validation loss

Conclusion

- Good base model
- Big data
- Longer training
- Already big data
- More argumentation methods
- No significant difference

Thanks for Listening