



IA LEMANS STUDYGROUP

Batch 00



A group of ten people are gathered around a campfire in a desert setting. They are sitting on a wooden bench and the ground, holding cups and bottles. The background shows red rock formations and a clear sky.

# STUDYGROUP

# #BATCH00-PART2

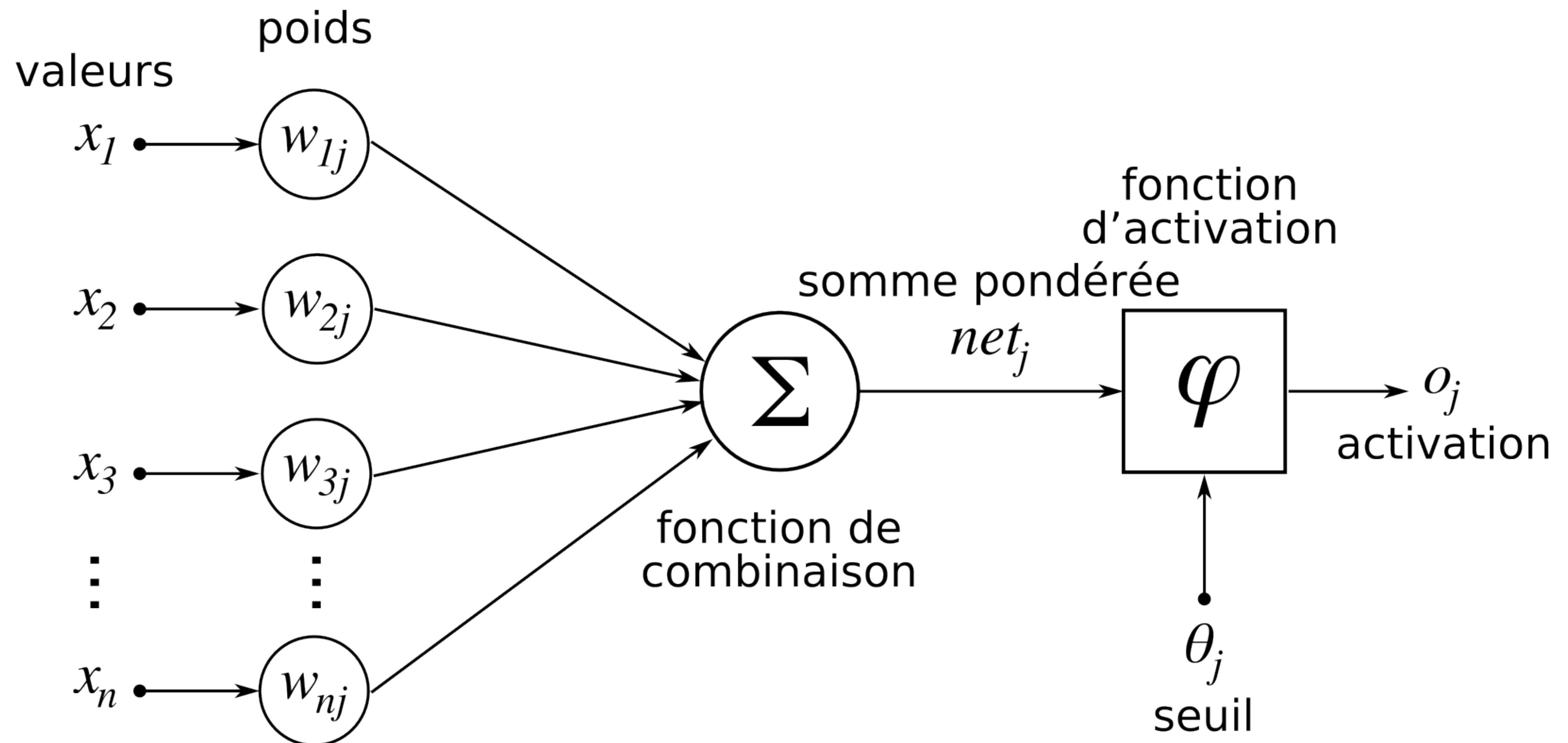




# Réseaux de Neurones

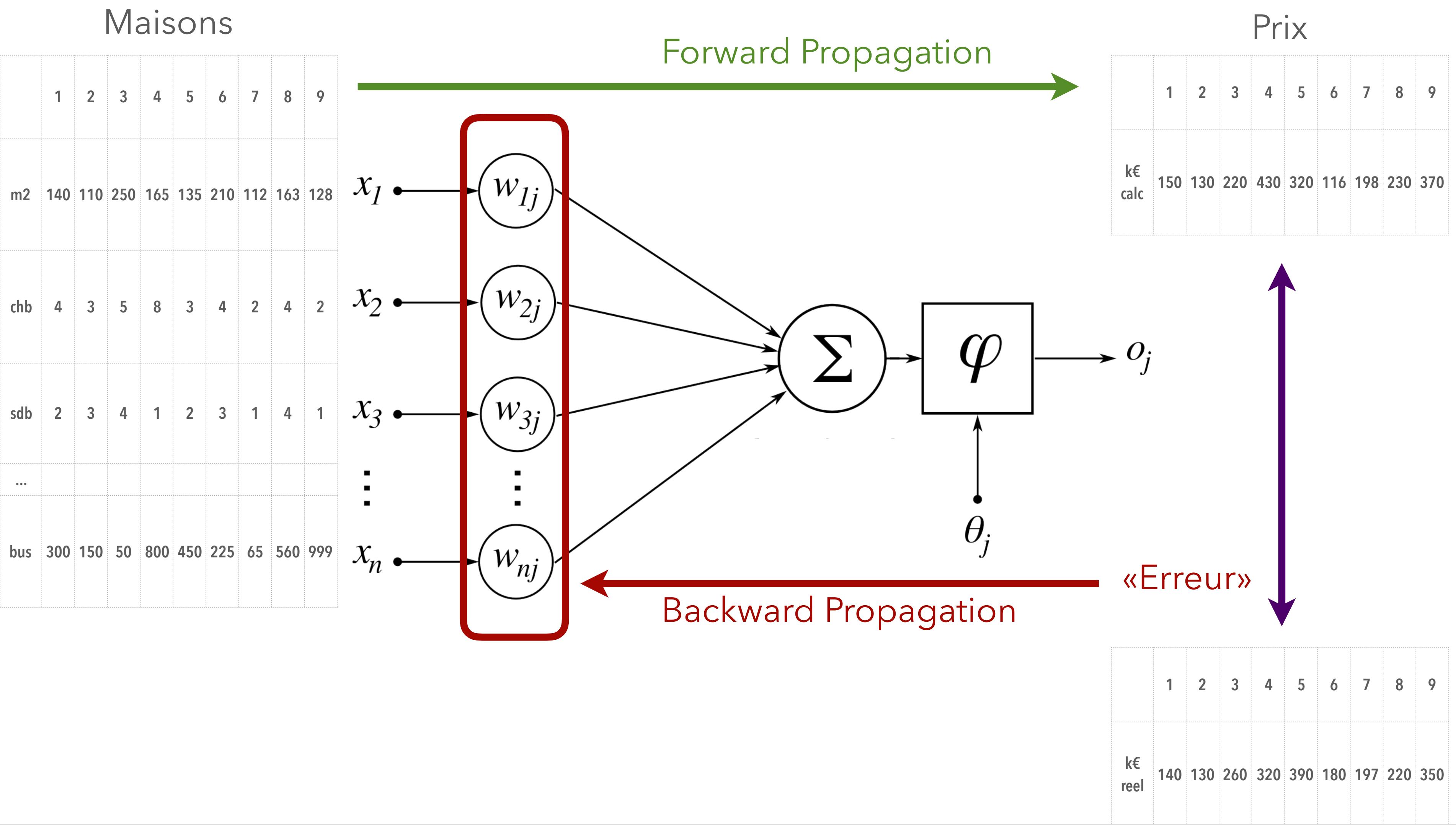


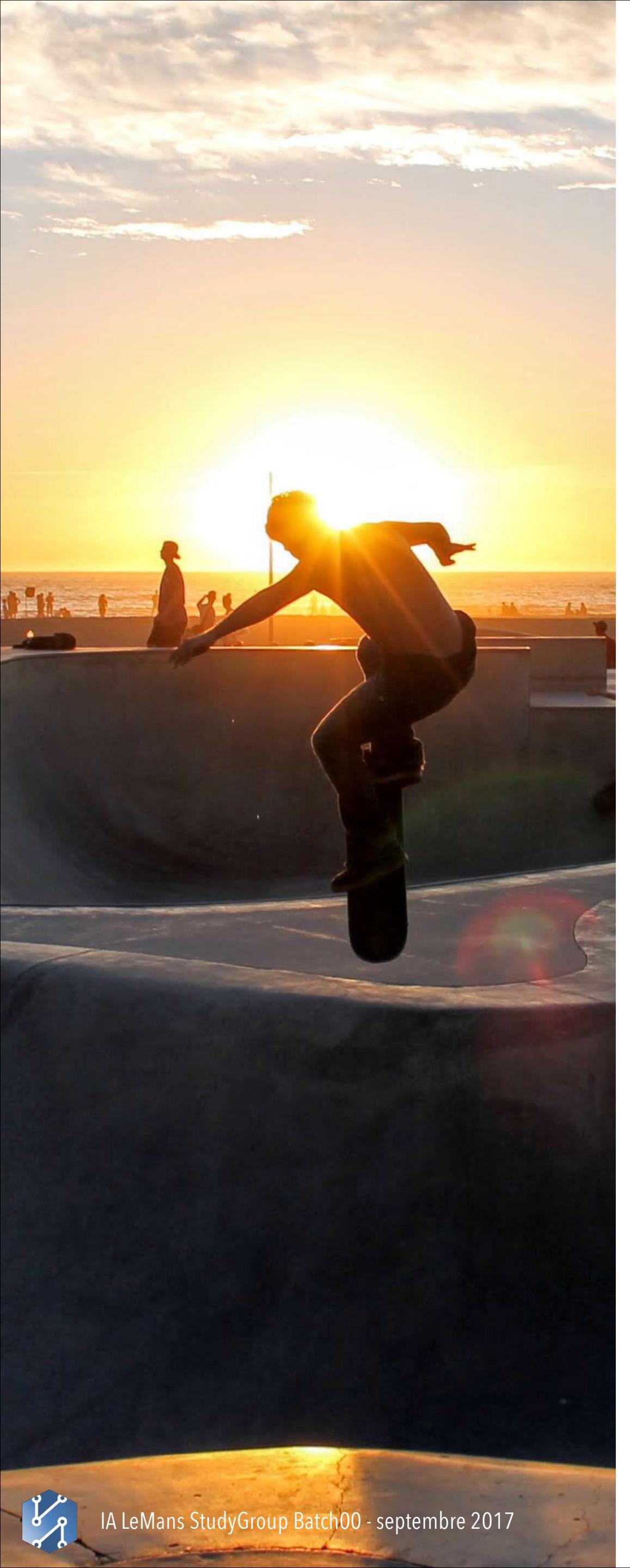
# RÉSEAU DE NEURONES





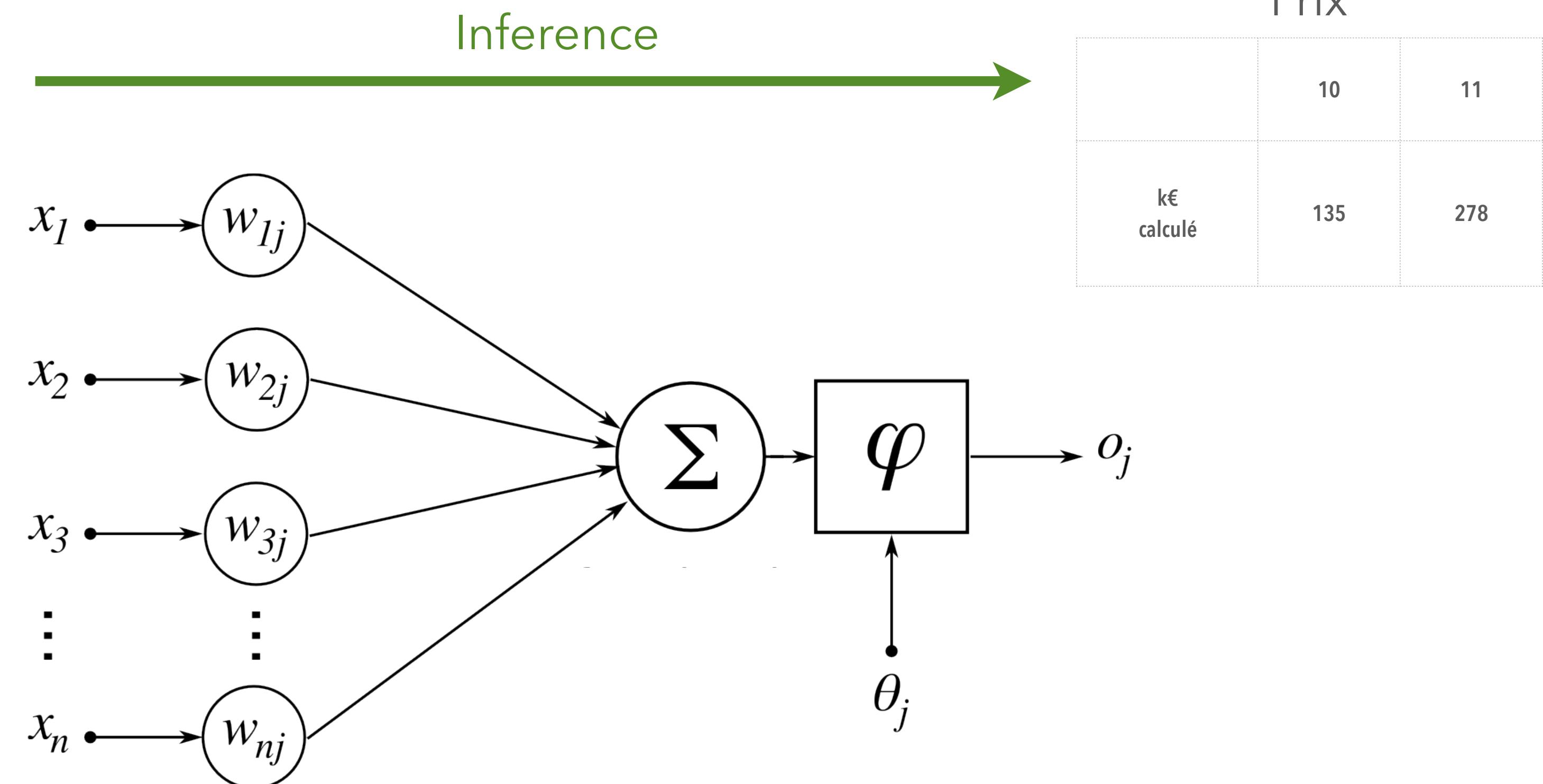
# RÉSEAU DE NEURONES | ENTRAINEMENT





# RÉSEAU DE NEURONES | PREDICTIONS

Maisons		
	10	11
m2	126	243
chb	2	5
sdb	1	4
...		
bus	200	840



# MOLEY ROBOTICS KITCHEN

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# Réseaux de Neurones Convolutionnels

# LOCAL RECEPTIVE FIELDS

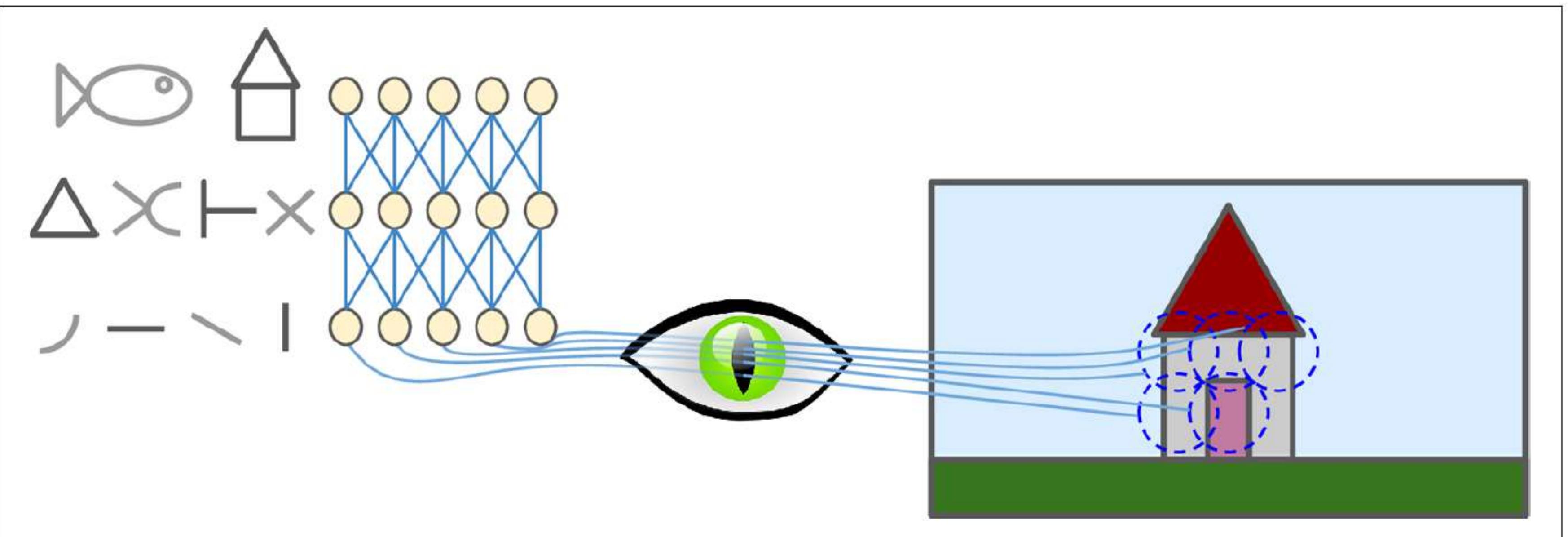
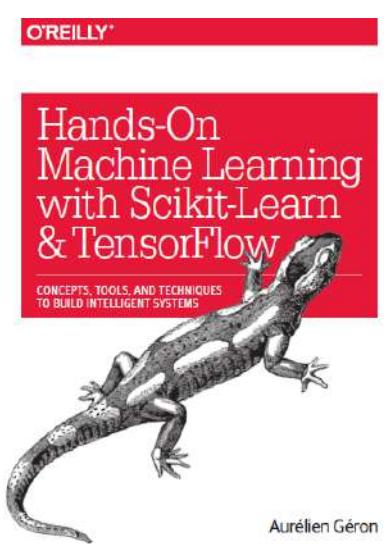


Figure 13-1. Local receptive fields in the visual cortex



[https://www.amazon.com/\\_/dp/1491962291](https://www.amazon.com/_/dp/1491962291)



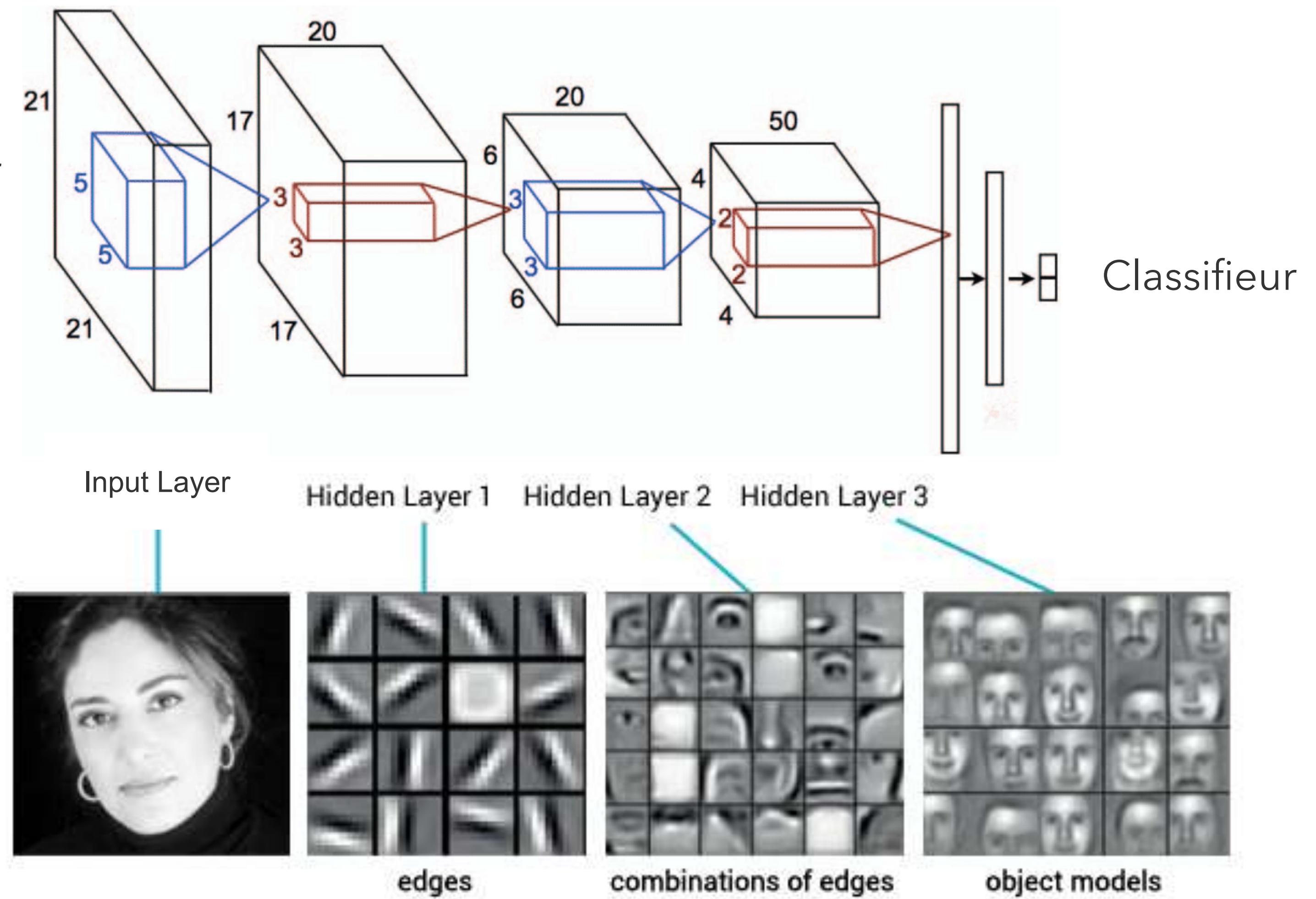
IA LeMans StudyGroup Batch00 - septembre 2017

Aurélien Géron

# CONVOLUTIONNAL LAYERS

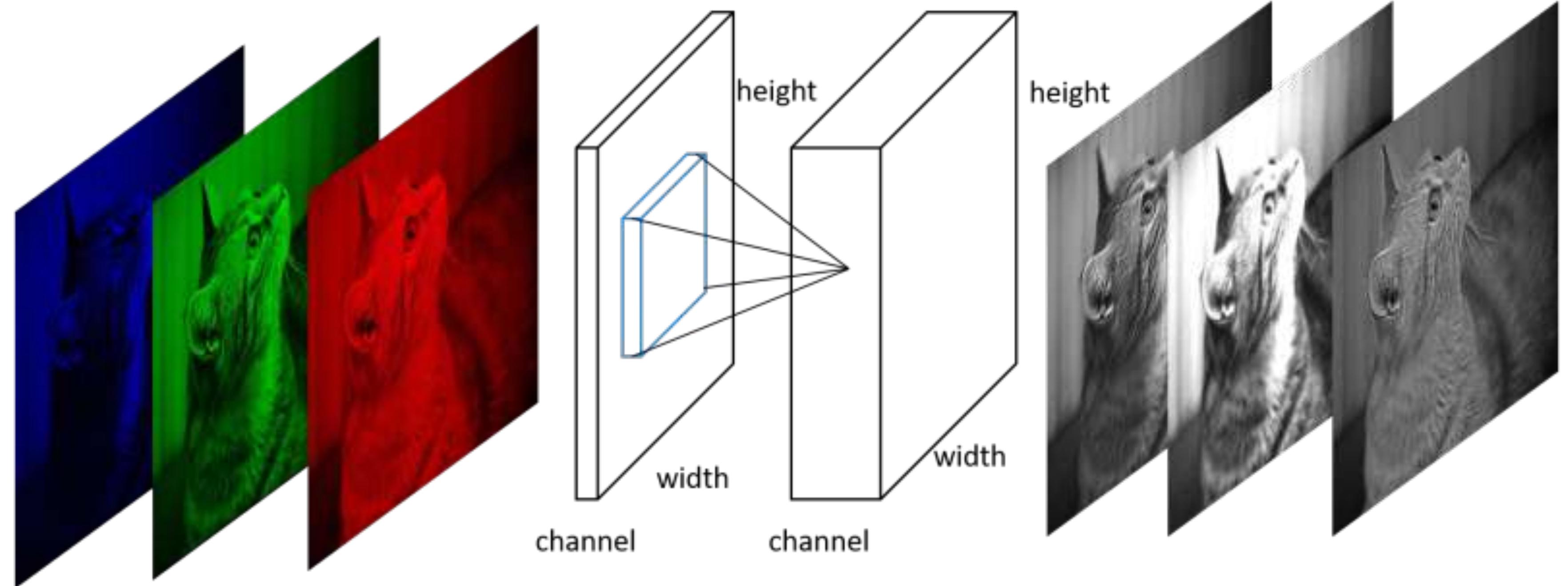


Image à traiter





## FEATURE MAPS



# FILTERS

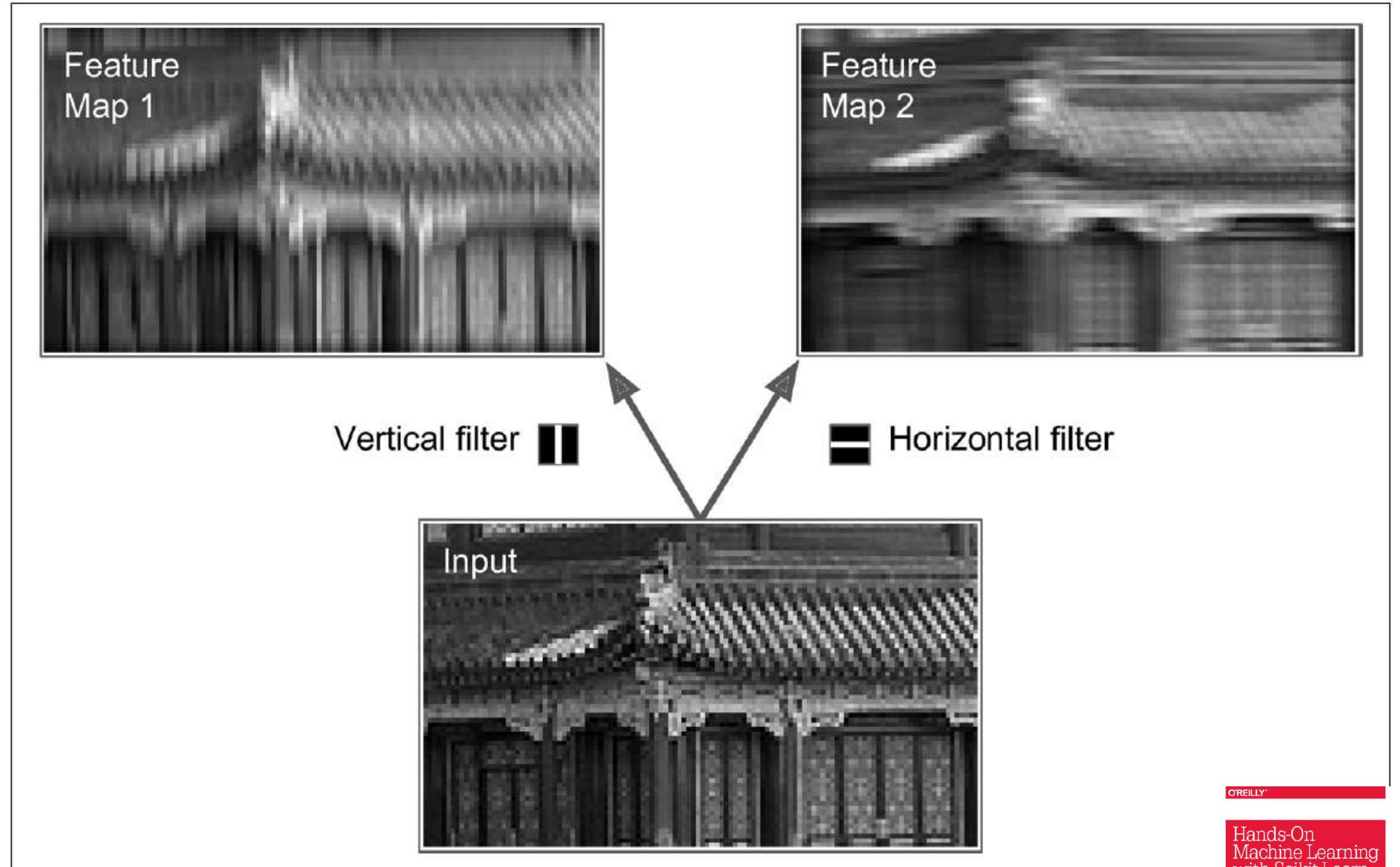
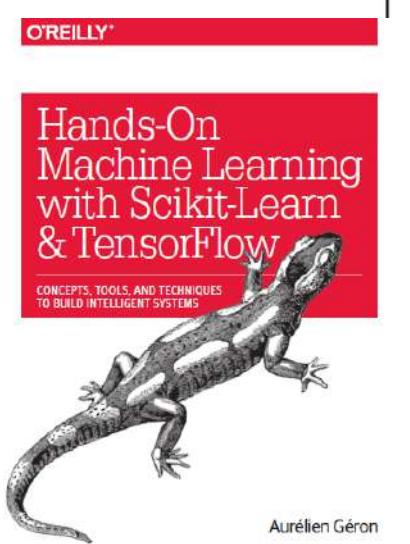
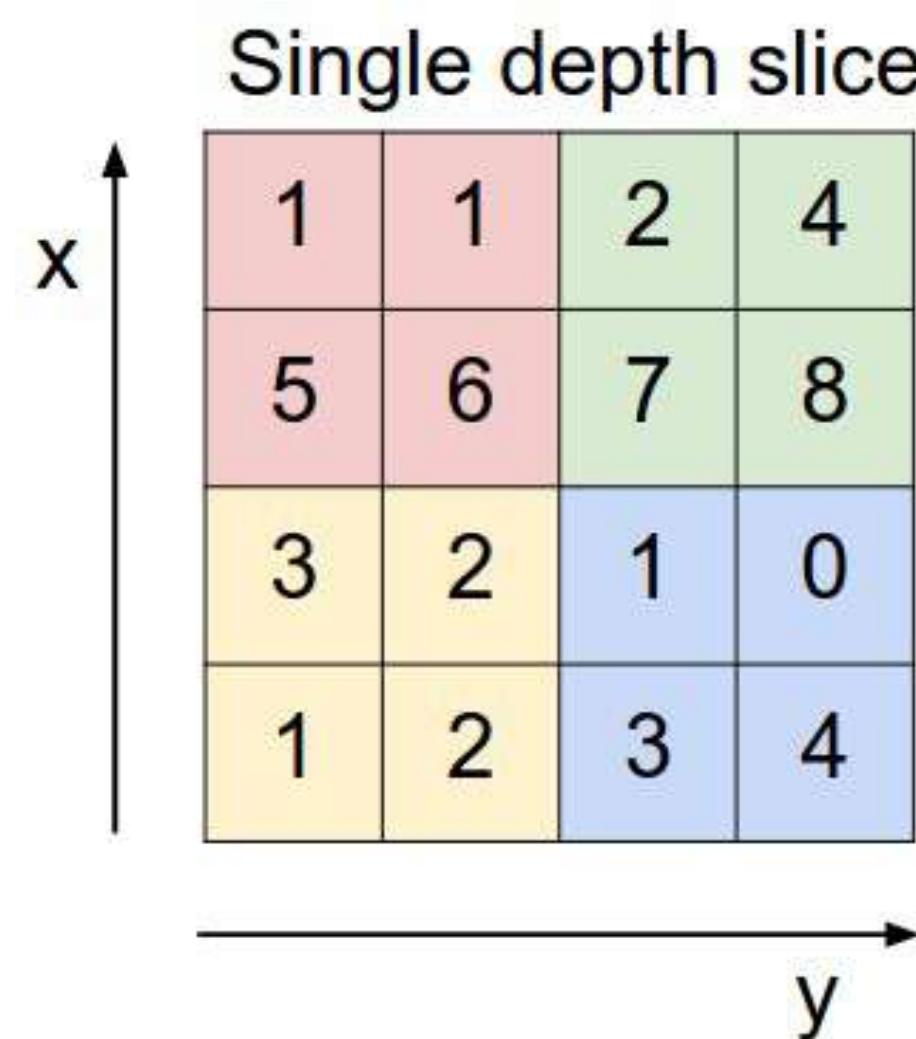


Figure 13-5. Applying two different filters to get two feature maps



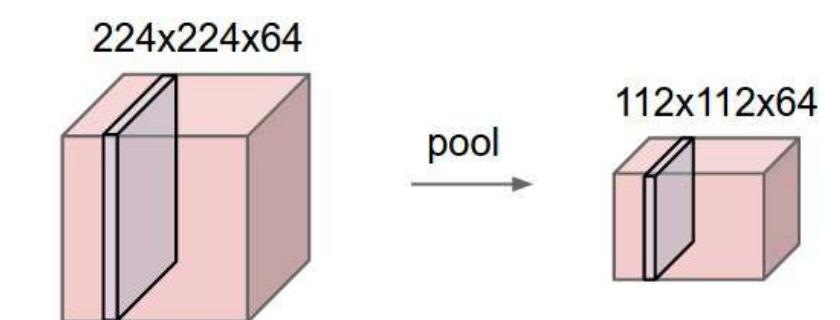
# POOLING LAYER



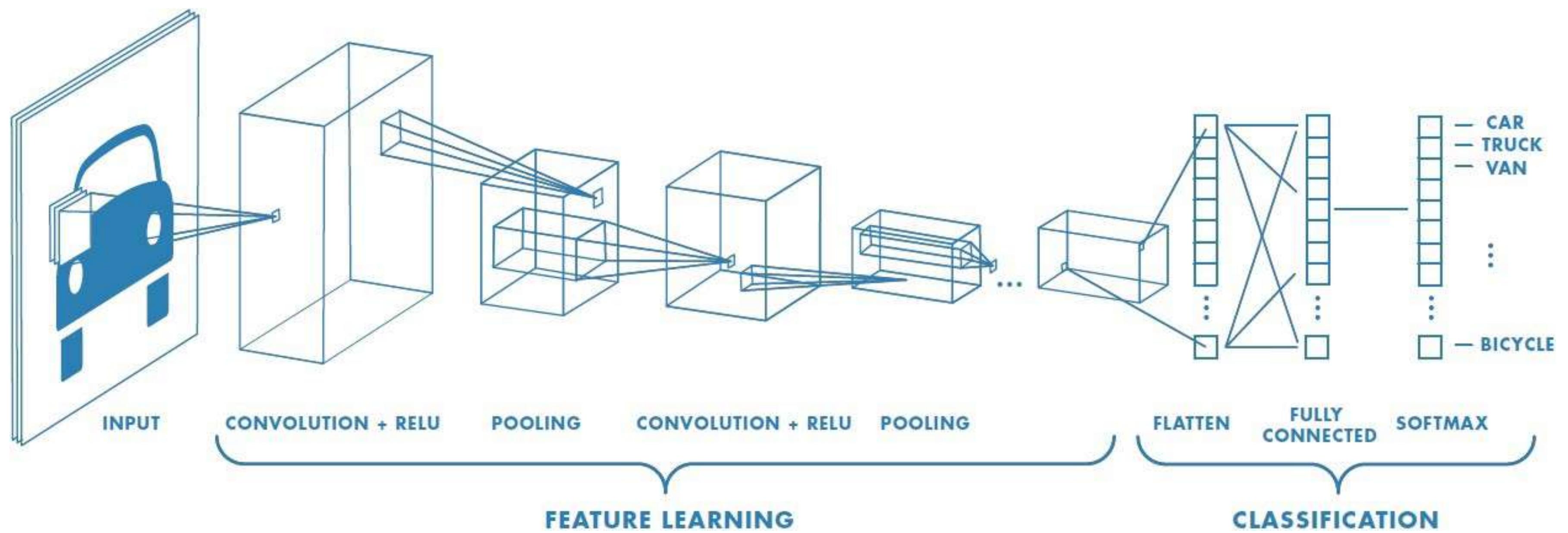
max pool with 2x2 filters  
and stride 2

6	8
3	4

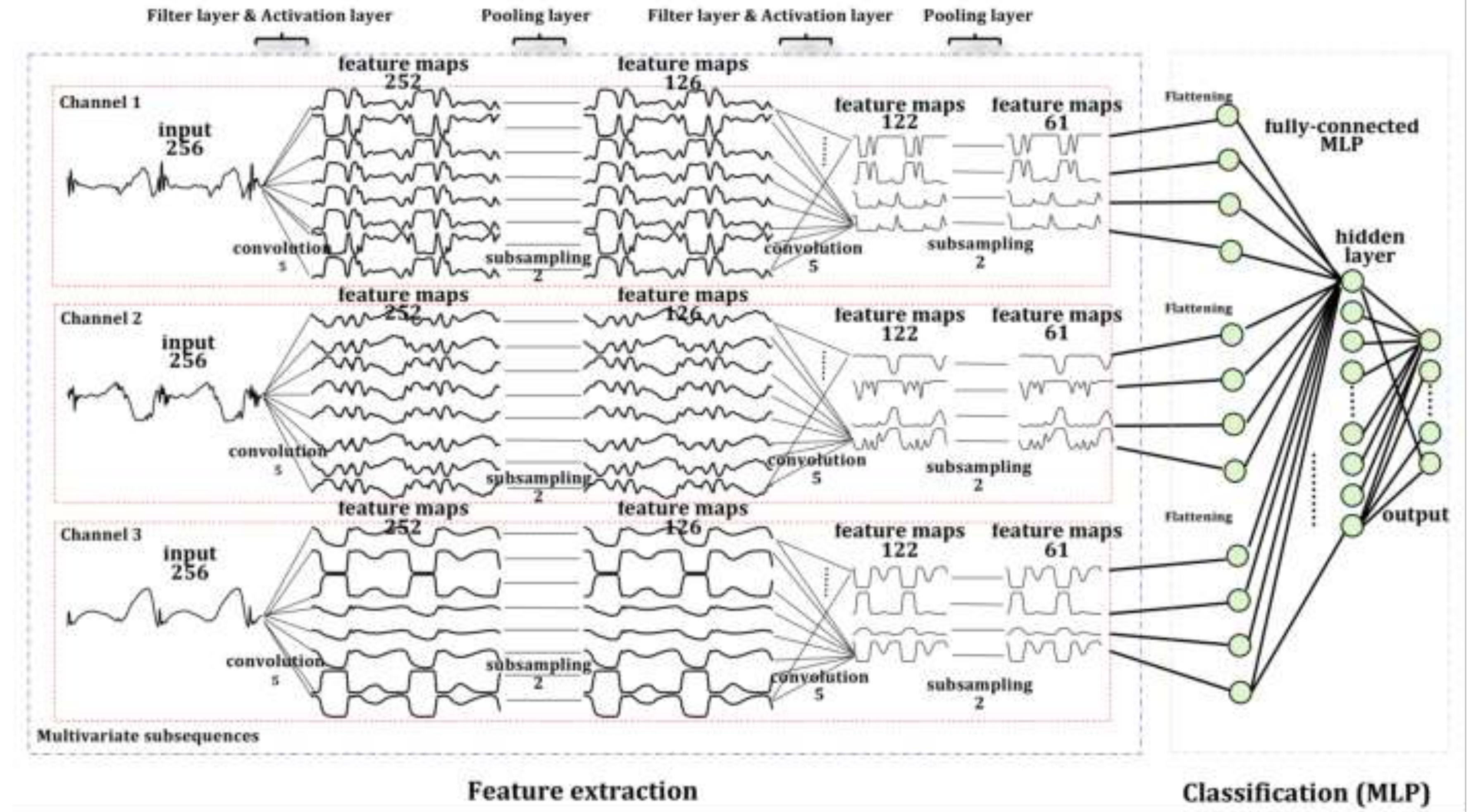
Réduire la charge  
de calculs !



# EN RÉSUMÉ



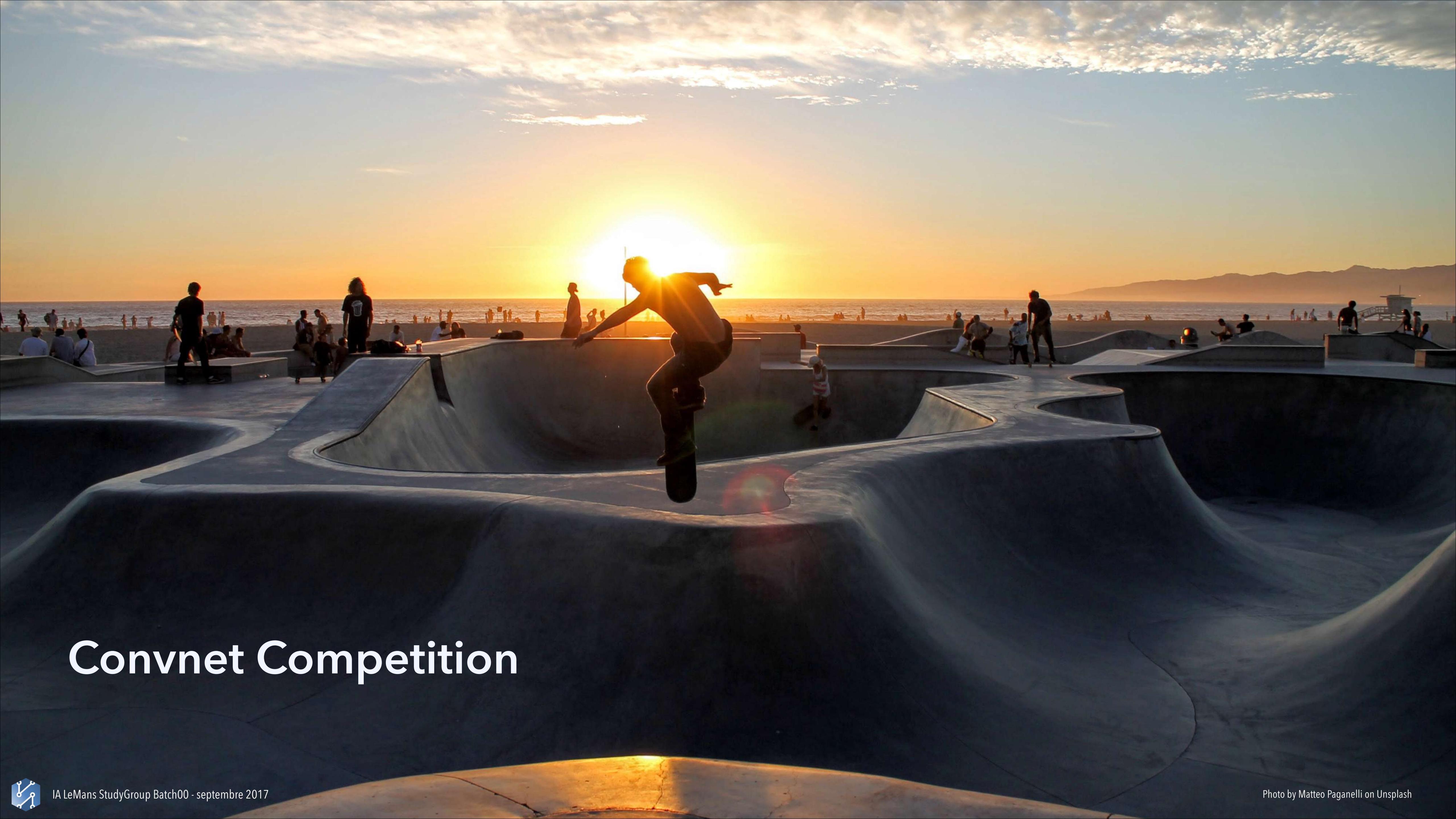
# TIME SERIES PREDICTIONS



# AI EXPERIMENTS

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# Convnet Competition





# LENET-5 | 1998

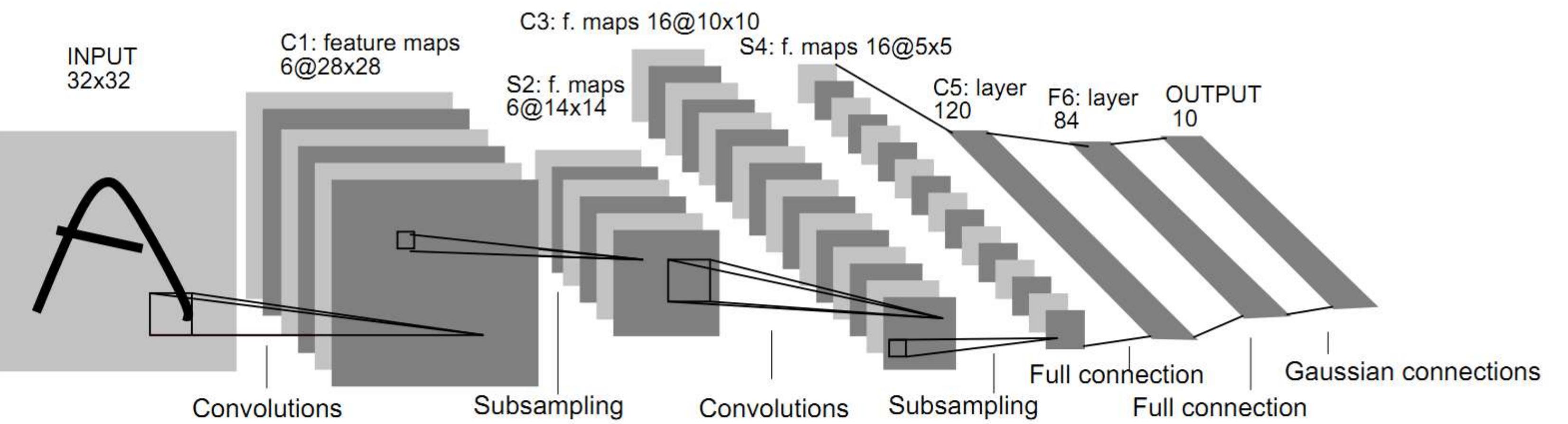
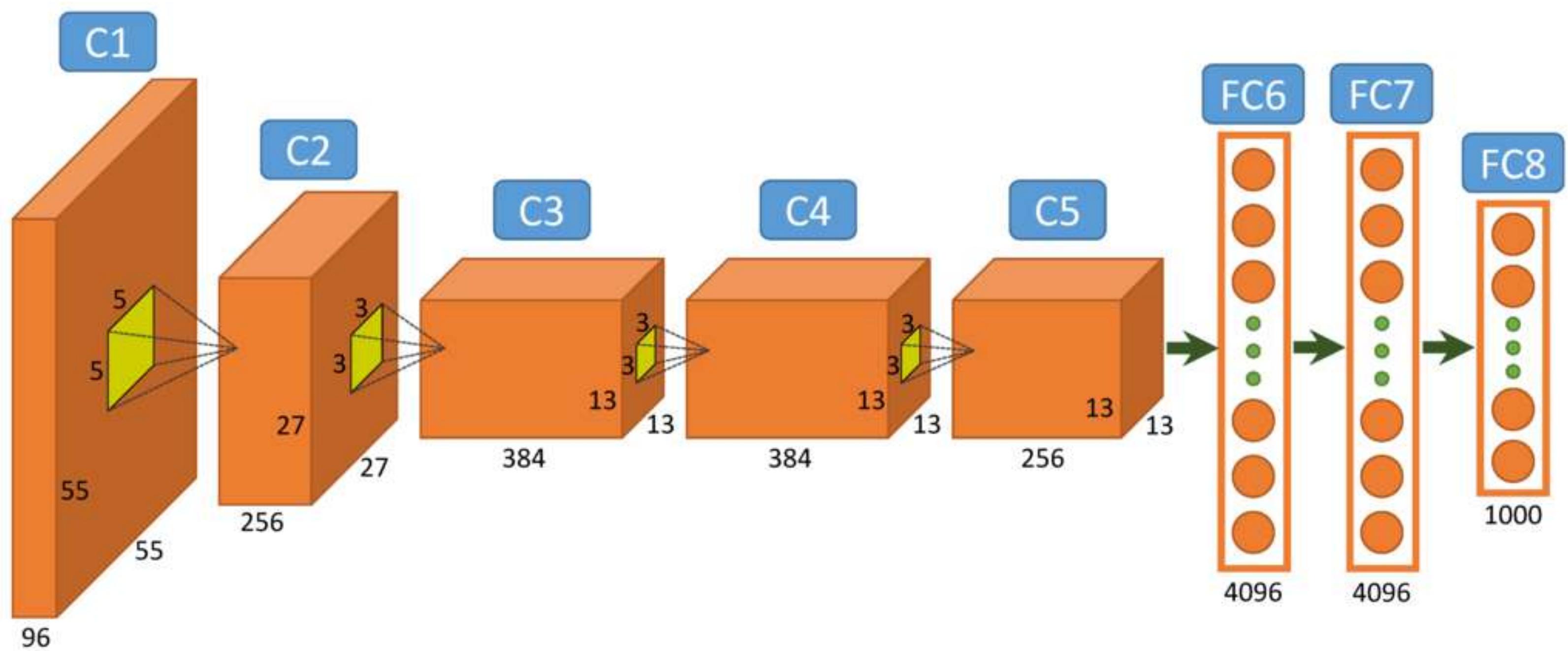


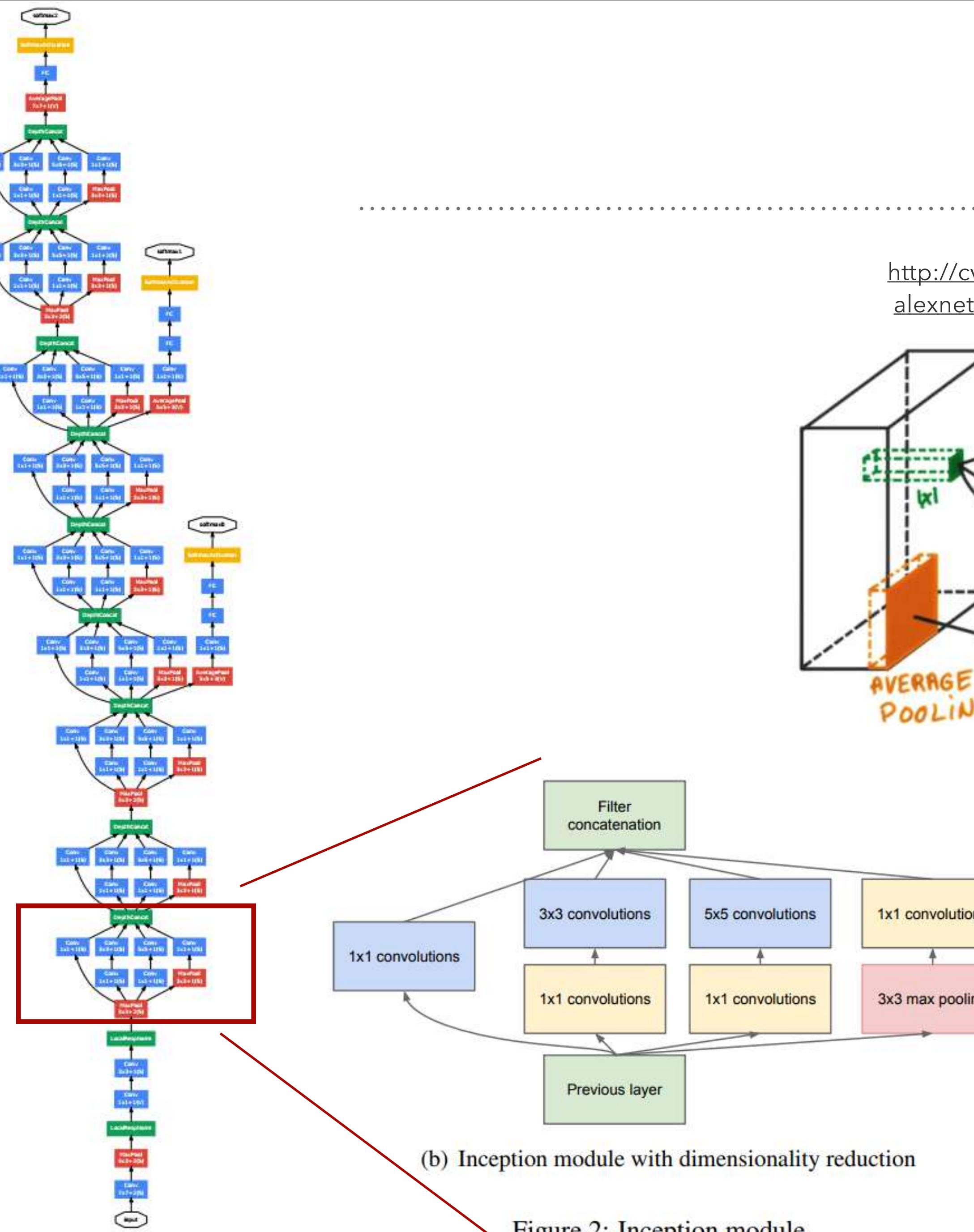
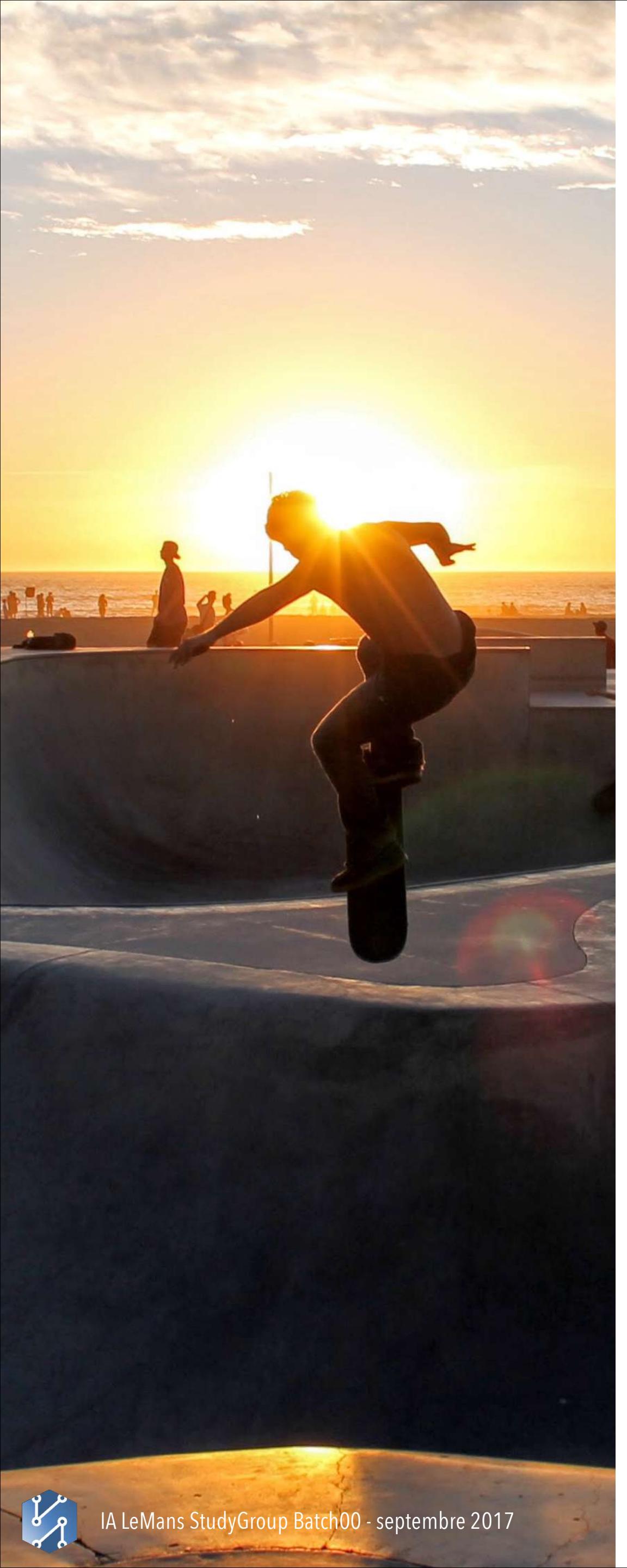
Fig. 2. Architecture of LeNet-5, a Convolutional Neural Network, here for digits recognition. Each plane is a feature map, i.e. a set of units whose weights are constrained to be identical.



# ALEXNET | 2012

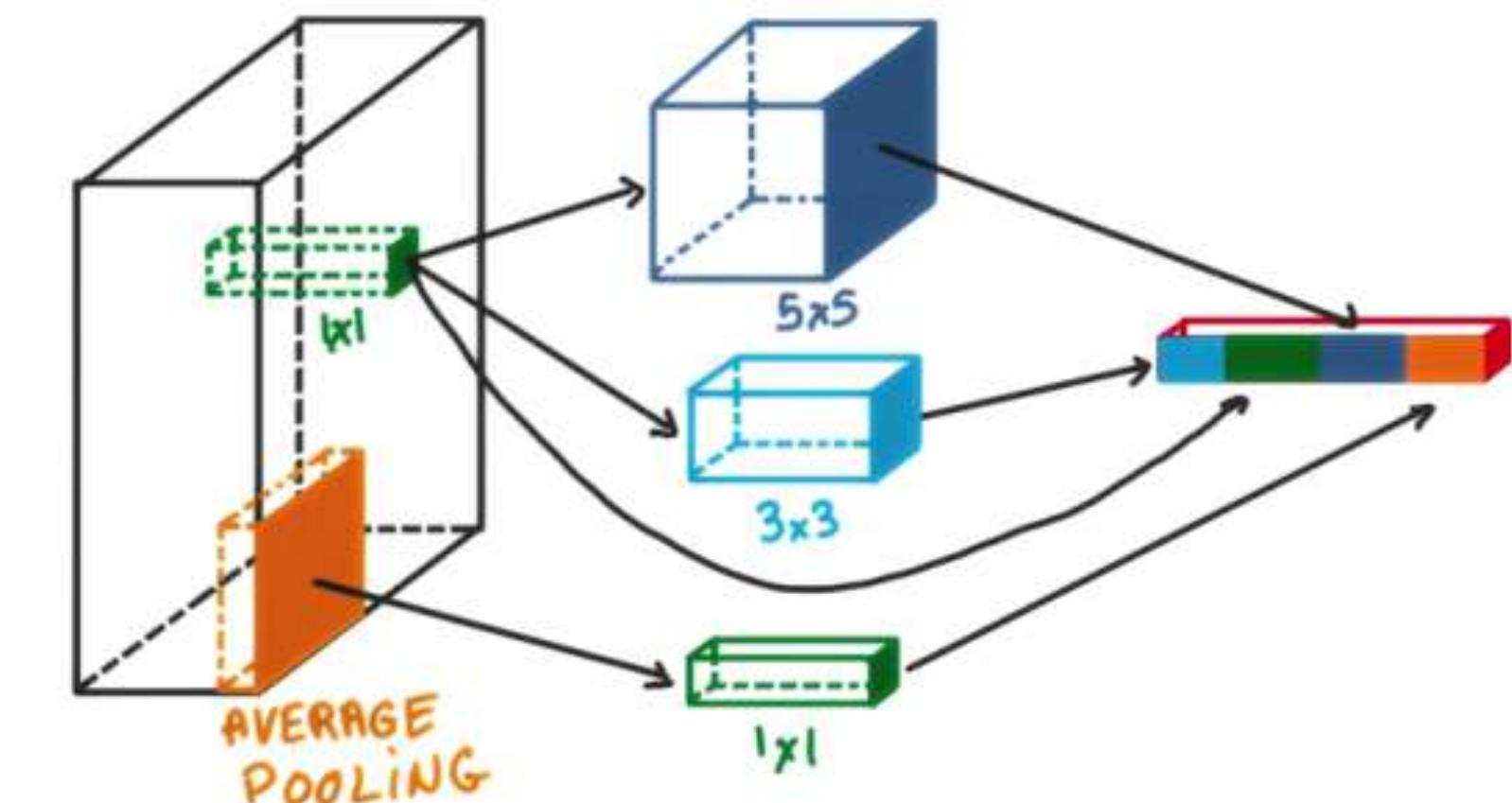


Local Response Normalization



# GOOGLENET | 2014

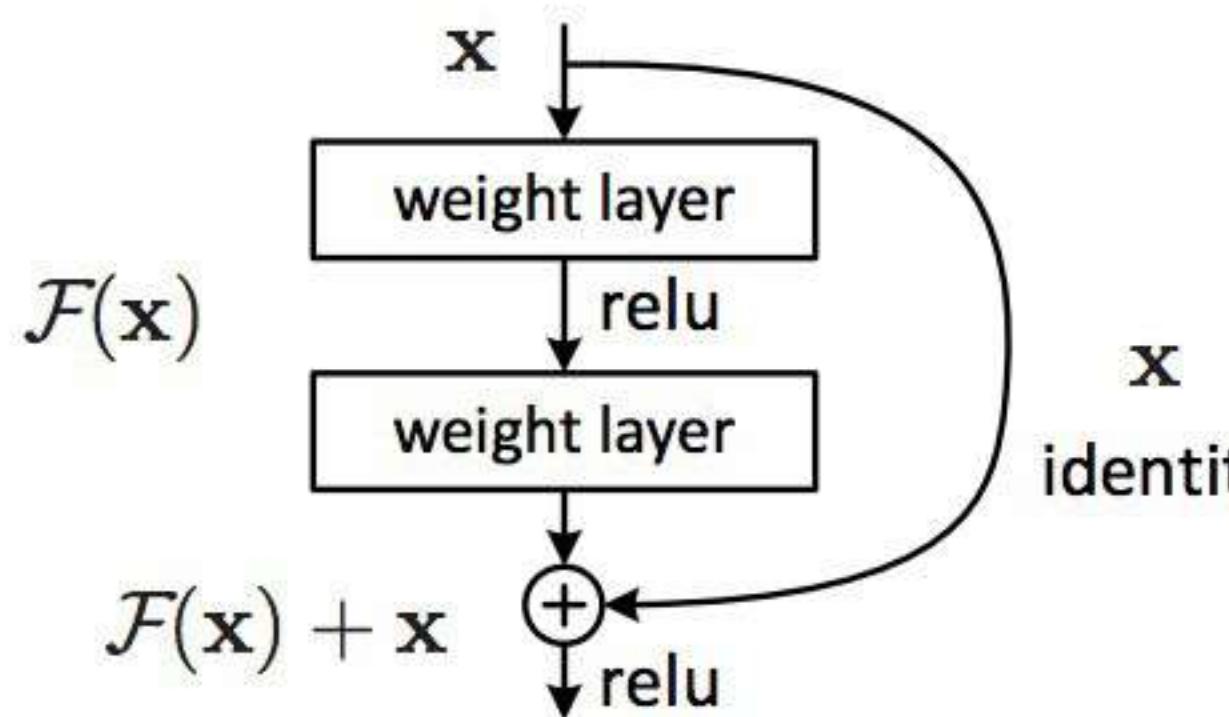
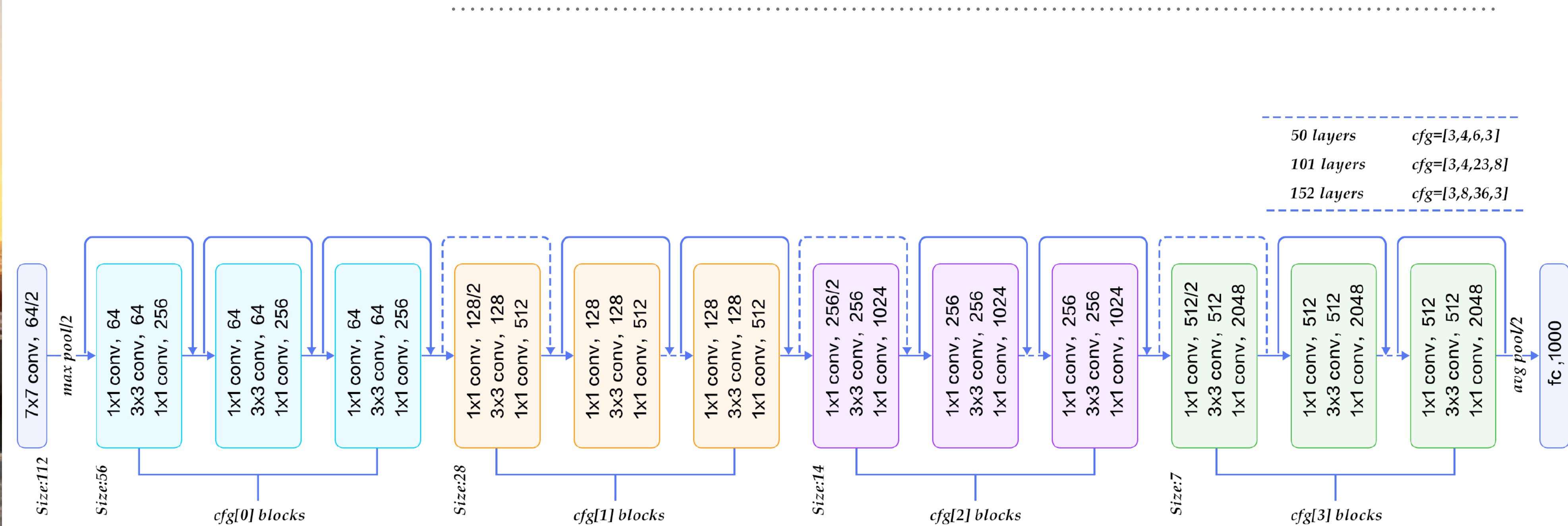
<http://cv-tricks.com/tensorflow-tutorial/understanding-alexnet-resnet-squeeze-net-and-running-on-tensorflow/>



(b) Inception module with dimensionality reduction

Figure 2: Inception module

# RESNET | 2015



Residual Learning



OVERFITTING ?



data augmentation + dropout

# HOT DOG

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# NEWBALANCE VS CONVERSE CONVOLUTION BATTLE

LUNDI 18.09 18:30 @LEMANSINNOVATION

BATCH 00 ARTIFICIAL  
INTELLIGENCE

STUDY GROUP LEMANS



⚡ #CHOISISTONCAMP ⚡



#CHOISISSTONCAMP



## Réutilisation du Modèle MobileNet entraîné sur le DataSet ImageNet



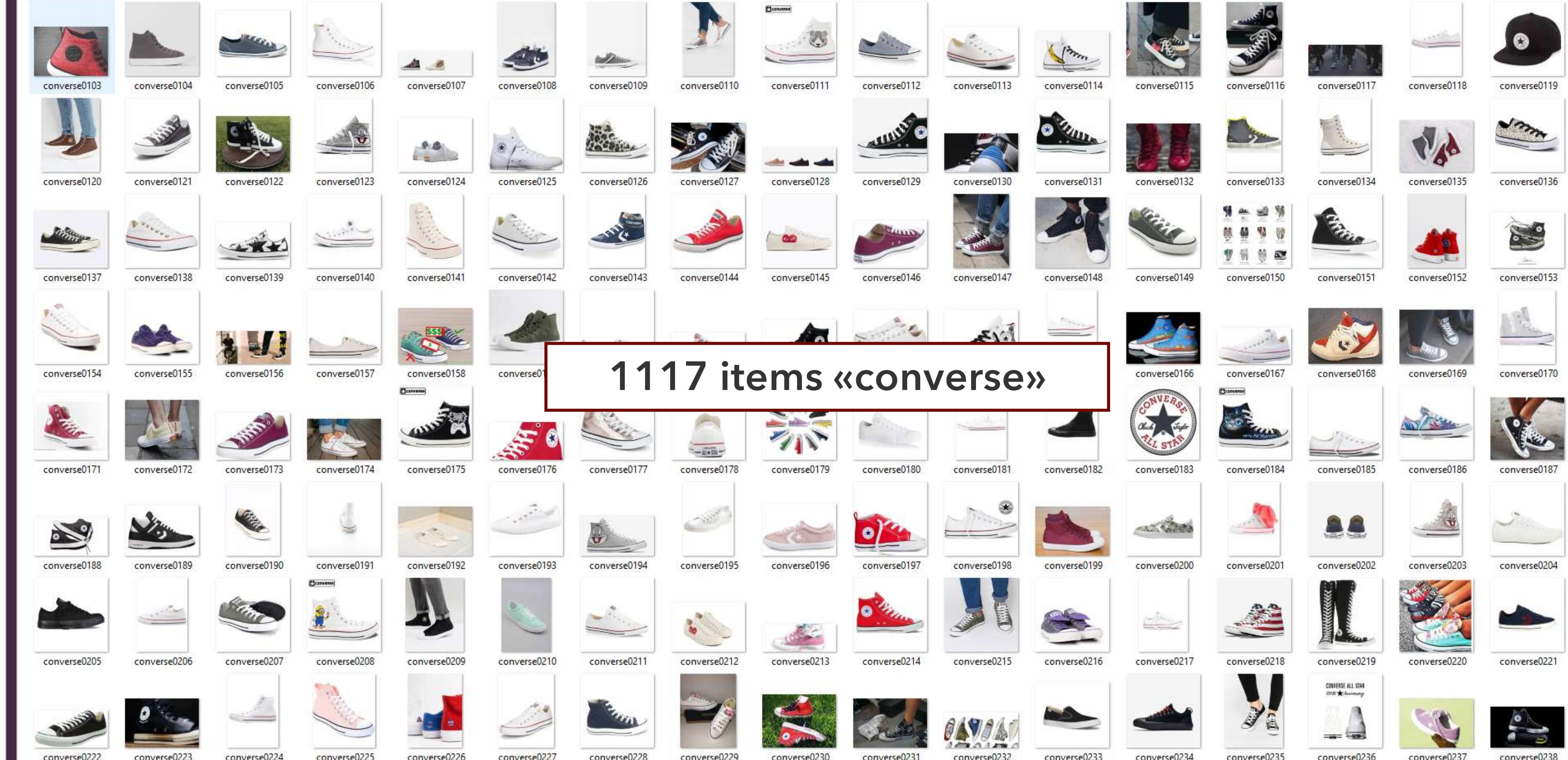
# TRAINING SETS



#CHOISISSTONCAMP



#CHOISISSTONCAMP



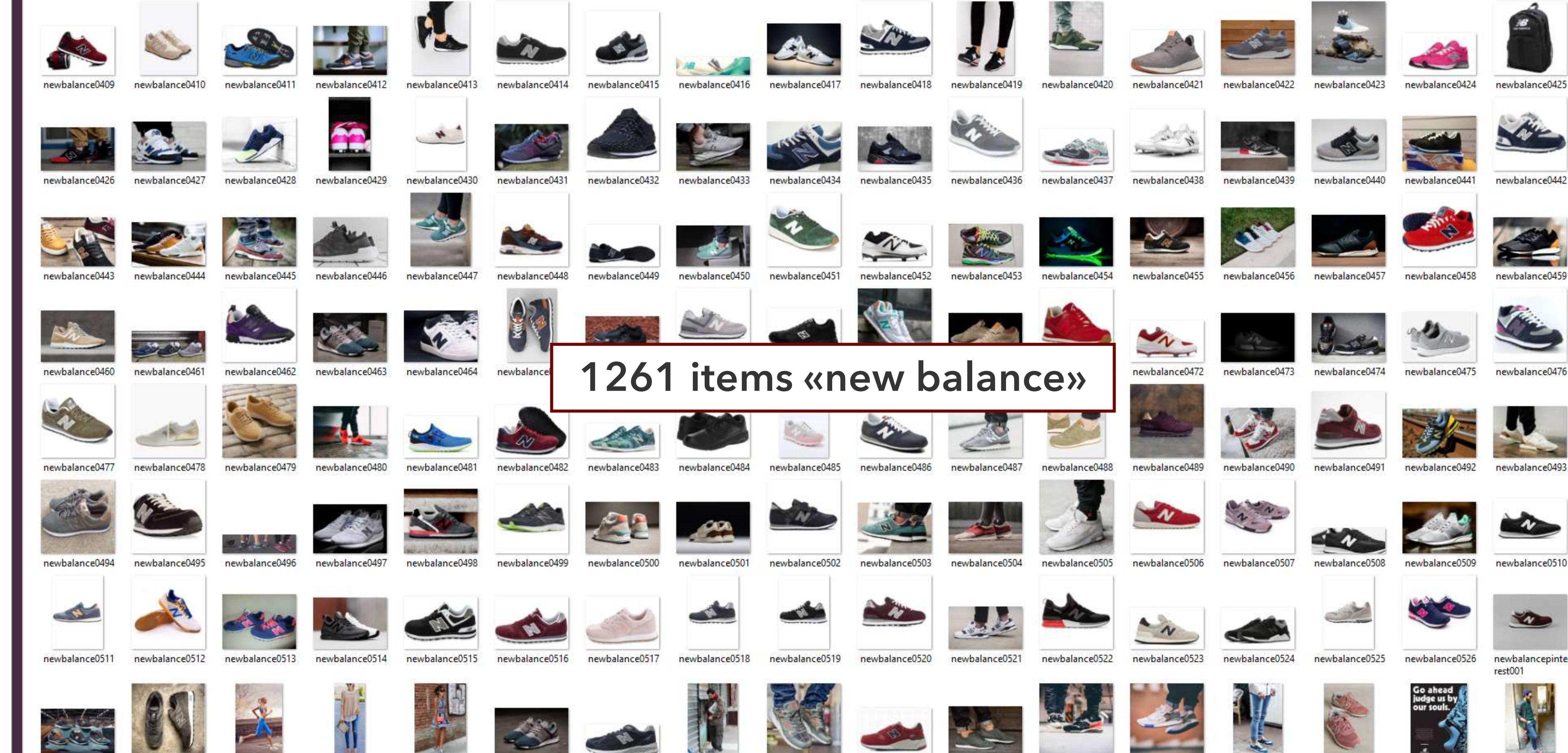
# TRAINING SETS



#CHOISISSTONCAMP



#CHOISISSTONCAMP



1261 items «new balance»



# RE-TRAINING



#CHOISISTONCAMP



#CHOISISTONCAMP



```
12
13 |set IMAGE_SIZE=224
14 set ARCHITECTURE="mobilenet_0.50_${IMAGE_SIZE}"
15
16 python -m scripts.retrain \
17   --bottleneck_dir=tf_files/bottlenecks \
18   --how_many_training_steps=500 \
19   --model_dir=tf_files/models/ \
20   --summaries_dir=tf_files/training_summaries/"${ARCHITECTURE}" \
21   --output_graph=tf_files/retrained_graph.pb \
22   --output_labels=tf_files/retrained_labels.txt \
23   --architecture="${ARCHITECTURE}" \
24   --image_dir=tf_files/convbattle
25
```

learning rate : 0.5

epochs : 500

430: Train accuracy = 92.0%  
430: Cross entropy = 0.370336  
430: Validation accuracy = 90.0% (N=100)  
430: Cross entropy = 0.345183  
430: Validation accuracy = 86.0% (N=100)  
450: Train accuracy = 89.0%  
450: Cross entropy = 0.729333  
450: Validation accuracy = 88.0% (N=100)  
  
INFO:tensorflow:2017-09-16 02:12:39.764190: Step 460: Train accuracy = 95.0%  
INFO:tensorflow:2017-09-16 02:12:39.765196: Step 460: Cross entropy = 0.361723  
INFO:tensorflow:2017-09-16 02:12:39.885512: Step 460: Validation accuracy = 92.0% (N=100)  
INFO:tensorflow:2017-09-16 02:12:41.030559: Step 470: Train accuracy = 89.0%  
INFO:tensorflow:2017-09-16 02:12:41.031561: Step 470: Cross entropy = 0.459319  
INFO:tensorflow:2017-09-16 02:12:41.148874: Step 470: Validation accuracy = 93.0% (N=100)  
INFO:tensorflow:2017-09-16 02:12:42.177610: Step 480: Train accuracy = 87.0%  
INFO:tensorflow:2017-09-16 02:12:42.178613: Step 480: Cross entropy = 0.624774  
INFO:tensorflow:2017-09-16 02:12:42.249801: Step 480: Validation accuracy = 86.0% (N=100)  
INFO:tensorflow:2017-09-16 02:12:43.008822: Step 490: Train accuracy = 85.0%  
INFO:tensorflow:2017-09-16 02:12:43.008822: Step 490: Cross entropy = 0.442809  
INFO:tensorflow:2017-09-16 02:12:43.079040: Step 490: Validation accuracy = 88.0% (N=100)  
INFO:tensorflow:2017-09-16 02:12:43.751797: Step 499: Train accuracy = 86.0%  
INFO:tensorflow:2017-09-16 02:12:43.751797: Step 499: Cross entropy = 0.534420  
INFO:tensorflow:2017-09-16 02:12:43.831009: Step 499: Validation accuracy = 89.0% (N=100)  
INFO:tensorflow:Final test accuracy = 86.4% (N=514)  
INFO:tensorflow:Froze 2 variables.  
Converted 2 variables to const ops.

LAZY TRAINING!



# PRÉDICTIONS CONVERSE



#CHOISISONCAMP

converse 1.0  
newbalance 1.58378e-15



#CHOISISONCAMP

converse 0.999458  
newbalance 0.000541785



converse 1.0  
newbalance 3.87269e-11



converse 1.0  
newbalance 1.11199e-07



converse 1.0  
newbalance 3.5449e-11



newbalance 0.999996  
converse 4.44959e-06

# PRÉDICTIONS NEW BALANCE



#CHOISISONCAMP



**newbalance 1.0**  
converse 1.55583e-12



**newbalance 0.996189**  
converse 0.00381084



**newbalance 1.0**  
converse 5.80706e-10



**converse 1.0**  
**newbalance 1.58692e-13**



**newbalance 0.993334**  
converse 0.0066659



**newbalance 0.956941**  
converse 0.0430587

# AMBIGÜITÉS



#CHOISISTONCAMP



converse 0.503913  
newbalance 0.496087



converse 0.997756  
newbalance 0.00224402



converse 0.764252  
newbalance 0.235748

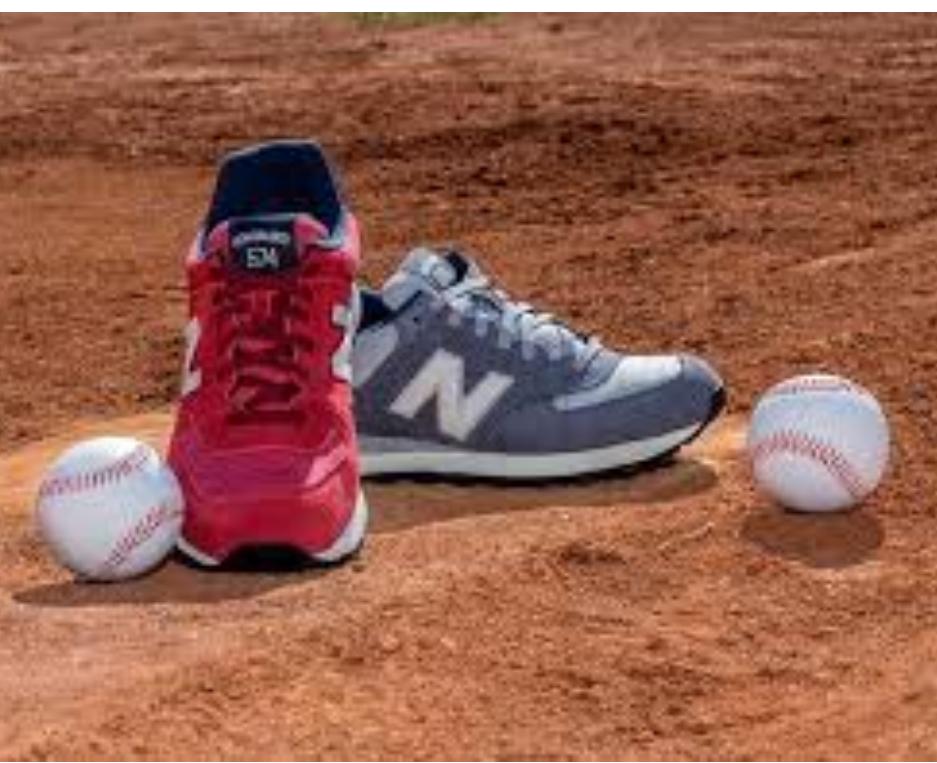


converse 0.999688  
newbalance 0.000312086

# NOUVEAU SET NEW BALANCE



#CHOISISONCAMP



newbalance 0.975009  
converse 0.0249914



newbalance 0.999984  
converse 1.64491e-05



newbalance 0.998362  
converse 0.0016385

???



converse 0.99036  
newbalance 0.00963913



converse 0.999963  
newbalance 3.74078e-05



converse 0.918787  
newbalance 0.0812129

# NOUVEAU SET CONVERSE



#CHOISISTONCAMP

converse 1.0  
newbalance 1.17533e-07



#CHOISISTONCAMP



converse 1.0  
newbalance 8.41235e-13



converse 0.999993  
newbalance 6.69295e-06



newbalance 0.998872  
converse 0.00112764



converse 1.0  
newbalance 2.26652e-08

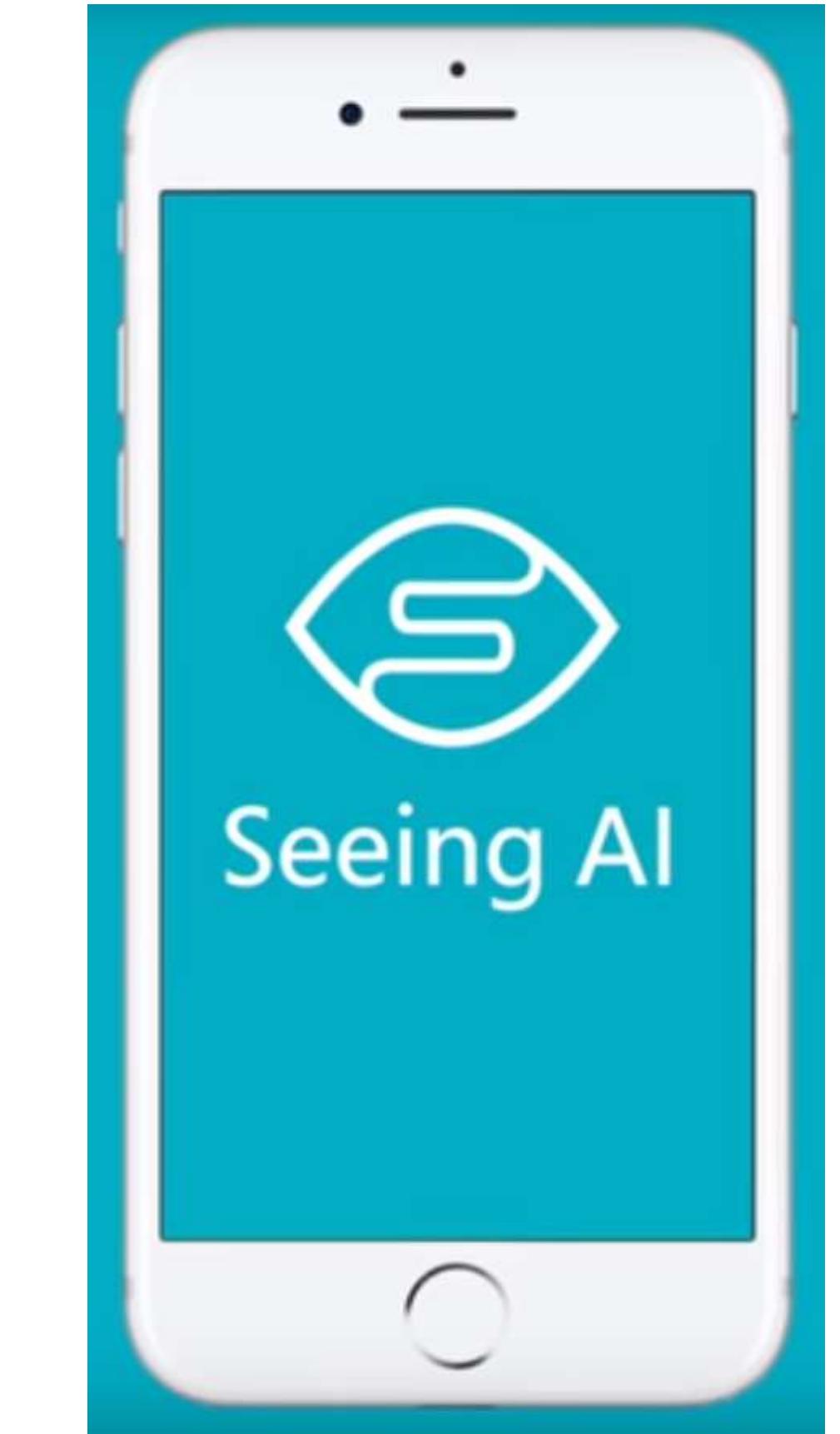


converse 0.538114  
newbalance 0.461886



SO  
HYPE

# LA MINUTE HYPE



<https://medium.com/@eddiesmo/a-meta-analysis-of-davis-2017-video-object-segmentation-challenge-c438790b3b56>

[https://youtu.be/bqeQByqf\\_f8](https://youtu.be/bqeQByqf_f8)



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@vincentporte  
[fb.me/IALeMans](https://fb.me/IALeMans)