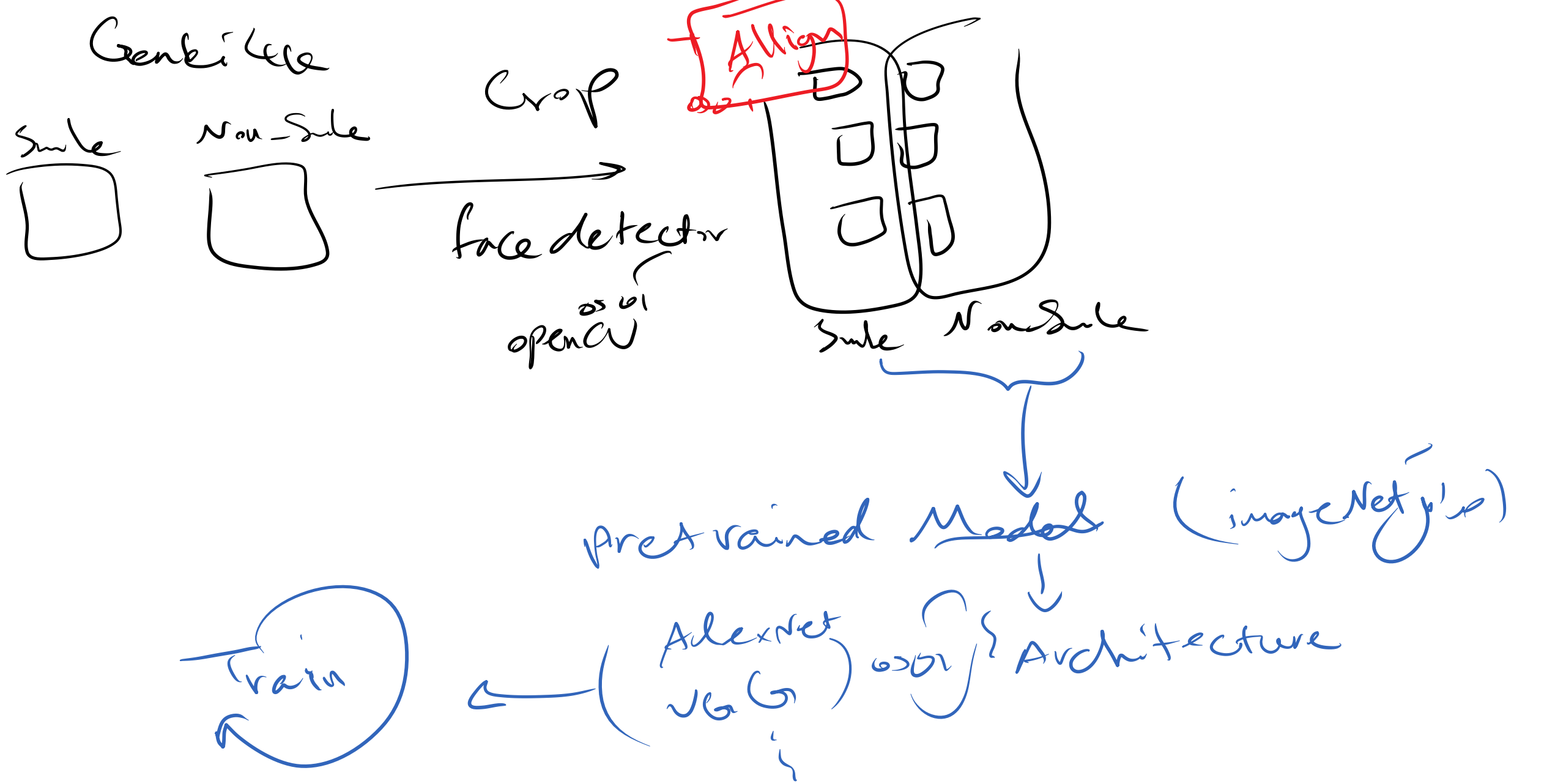
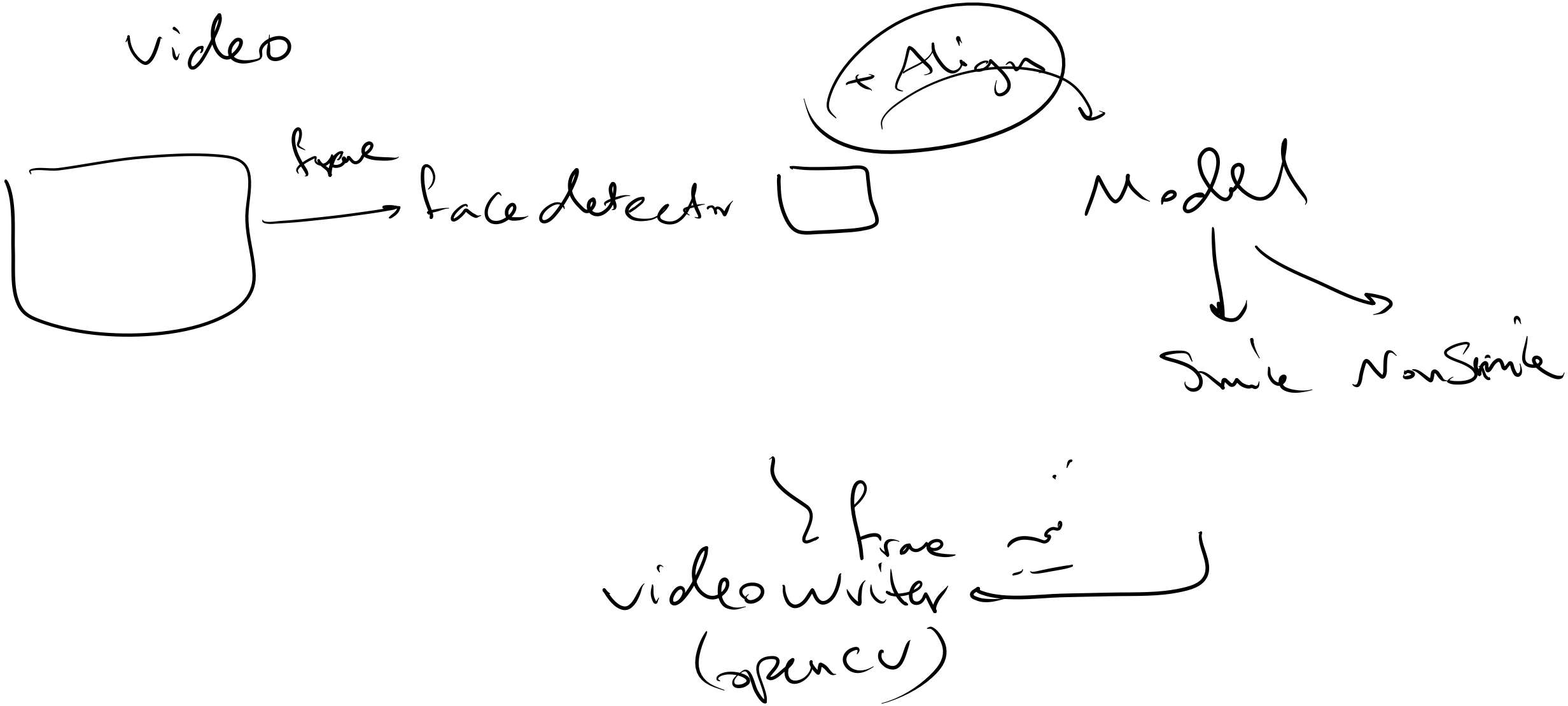
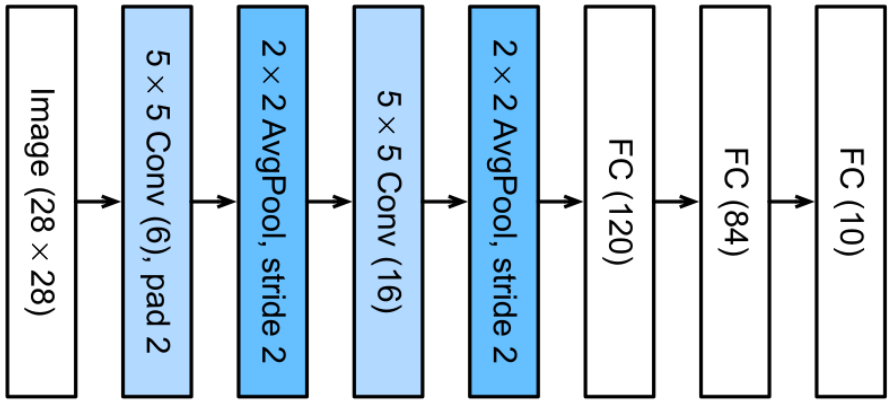
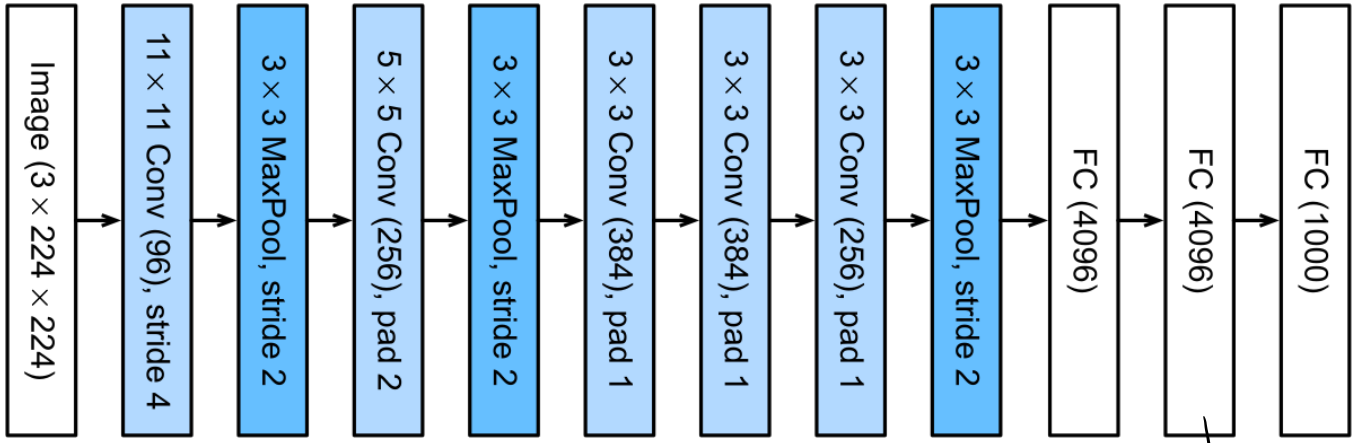

Genki 4k
Smile
Non_Smile
Crop
face detector
openCV
Align
Smile
Non_Smile
pretrained Models
(imageNet)
Architecture
AlexNet
VGG
Train


video
frame
face detection
+ Align
Model
Smile
NonSmile
frame
video writer
(opencv)



LeNet



AlexNet

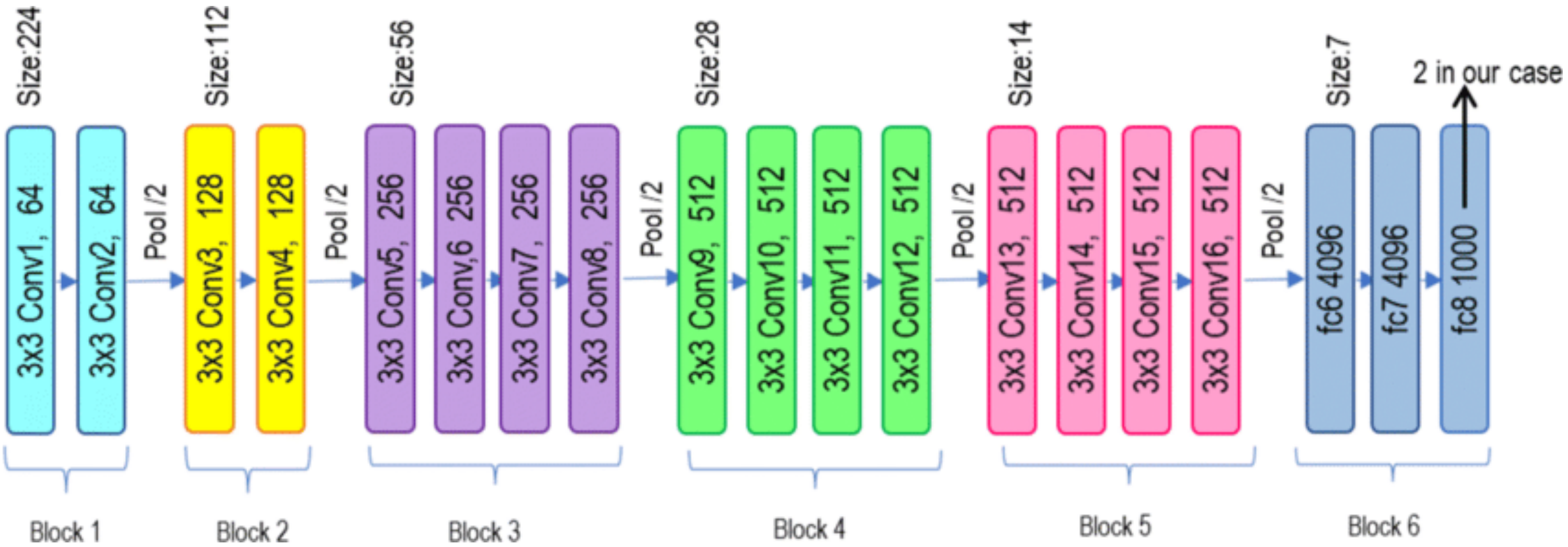
2012

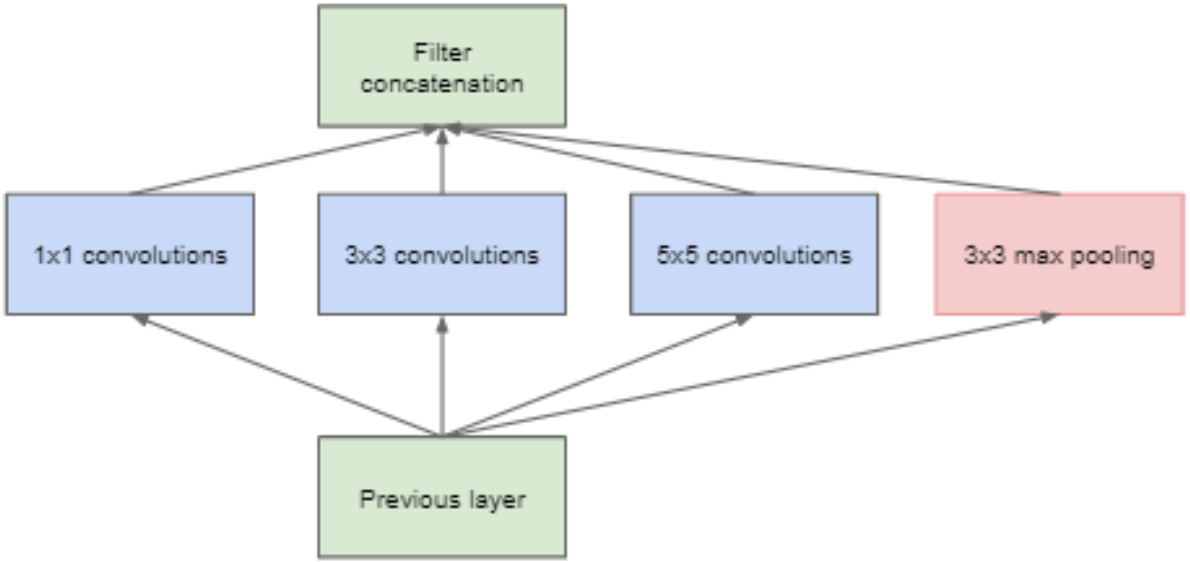
ZFNet

2013

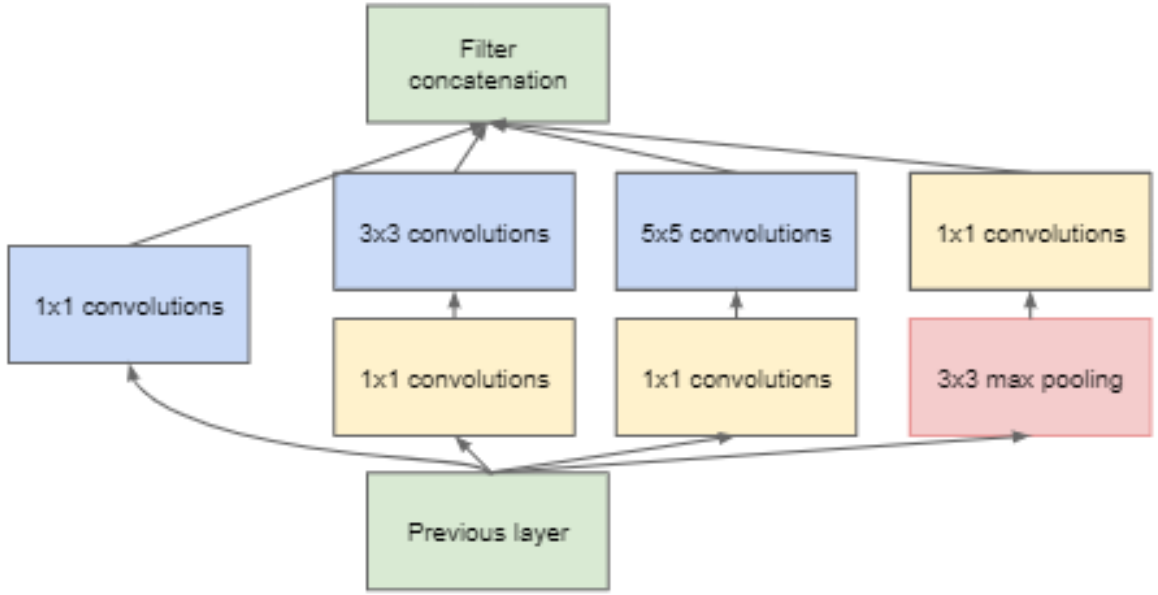
VGG - 16
INPUT
Conv 1-1
Conv 1-2
Pooling
Conv 2-1
Conv 2-2
Pooling
Conv 3-1
Conv 3-2
Conv 3-3
Pooling
Conv 4-1
Conv 4-2
Conv 4-3
Pooling
Conv 5-1
Conv 5-2
Conv 5-3
Pooling
Dense
Dense
Dense
OUTPUT

VGG (2014)

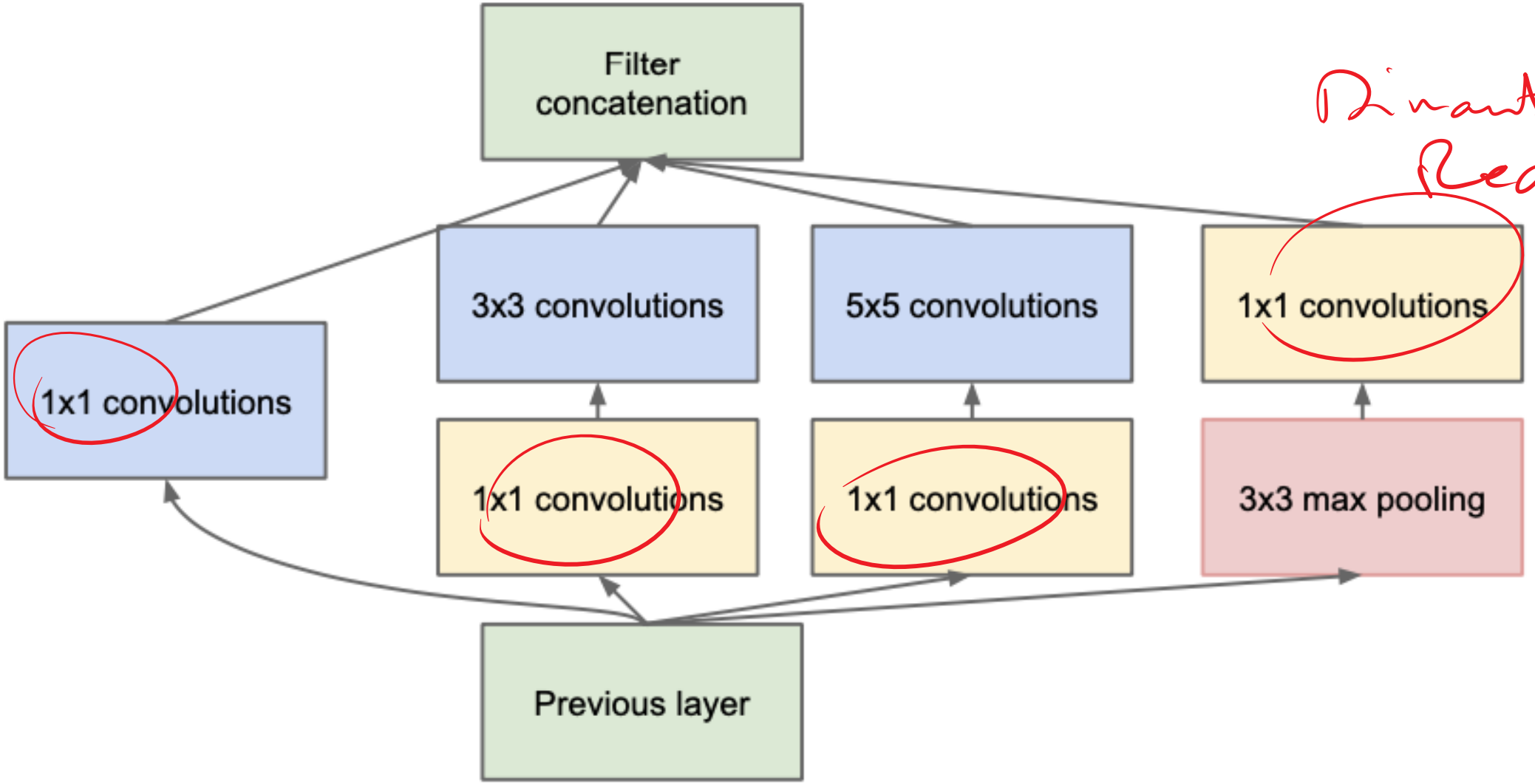

Size:224
Size:112
Size:56
Size:28
Size:14
Size:7
2 in our case
3x3 Conv1, 64
3x3 Conv2, 64
Pool /2
3x3 Conv3, 128
3x3 Conv4, 128
Pool /2
3x3 Conv5, 256
3x3 Conv,6 256
3x3 Conv7, 256
3x3 Conv8, 256
Pool /2
3x3 Conv9, 512
3x3 Conv10, 512
3x3 Conv11, 512
3x3 Conv12, 512
Pool /2
3x3 Conv13, 512
3x3 Conv14, 512
3x3 Conv15, 512
3x3 Conv16, 512
Pool /2
fc6 4096
fc7 4096
fc8 1000
Block 1
Block 2
Block 3
Block 4
Block 5
Block 6

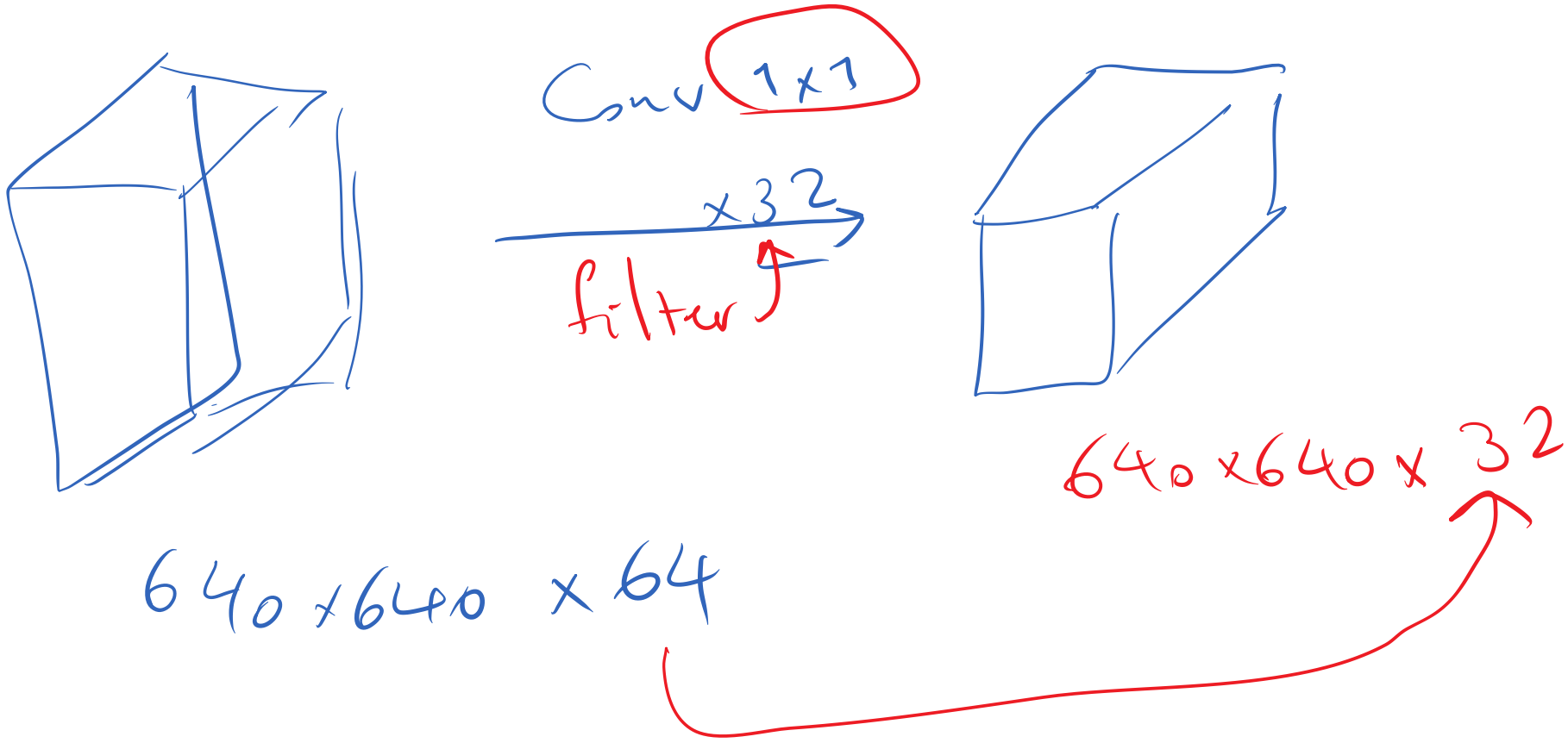


(a) Inception module, naïve version



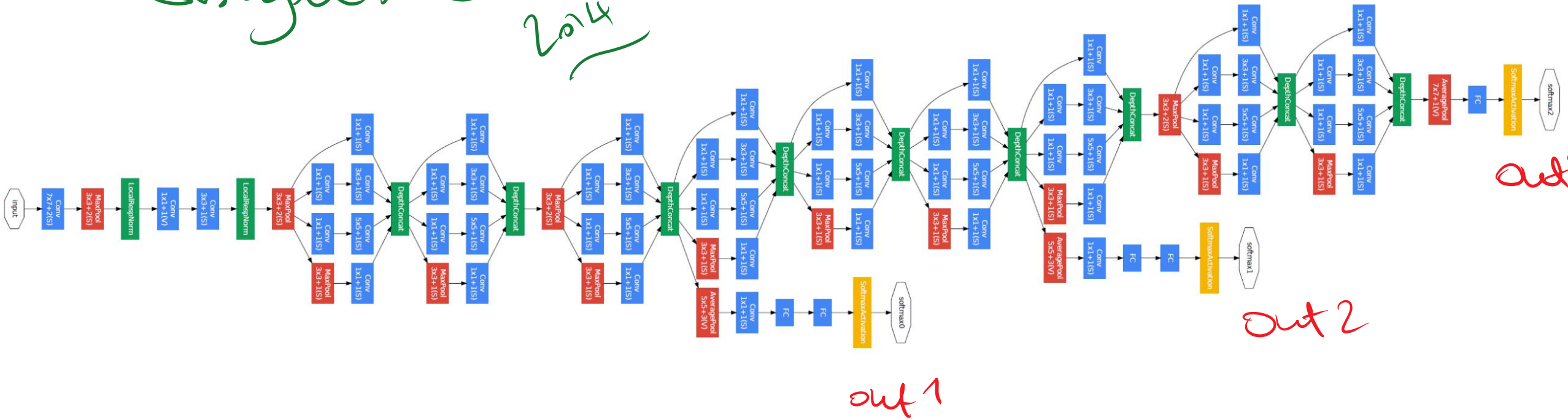
(b) Inception module with dimension reductions


Filter concatenation
3x3 convolutions
5x5 convolutions
1x1 convolutions
1x1 convolutions
1x1 convolutions
1x1 convolutions
3x3 max pooling
Previous layer


Conv 1×1
×32
filter
640×640×32
640×640×64

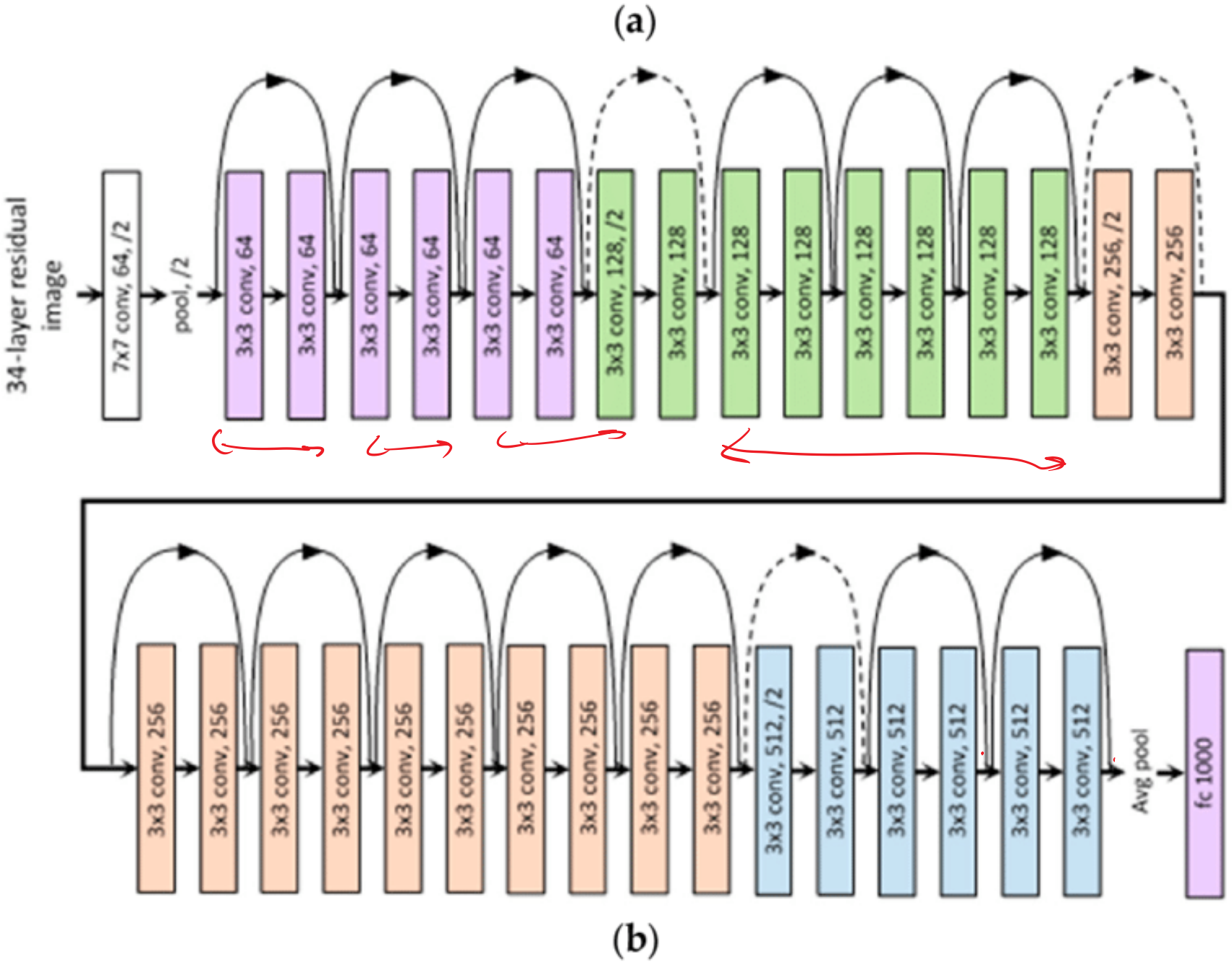
GoogleNet 2014

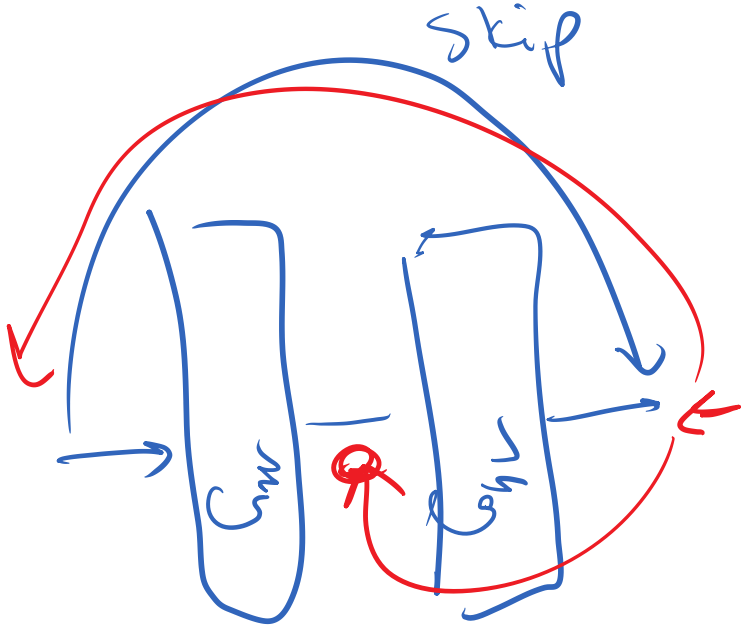
inception modules

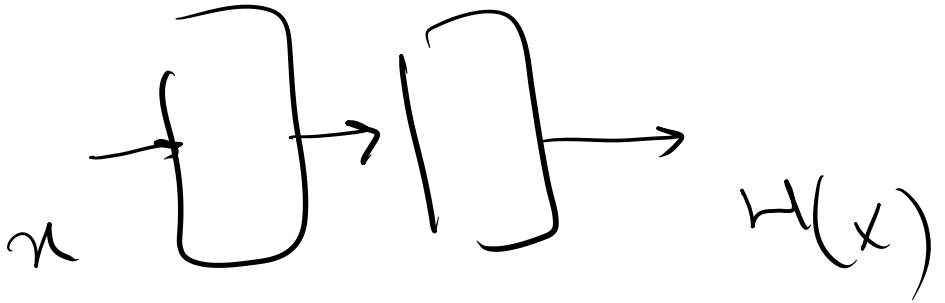


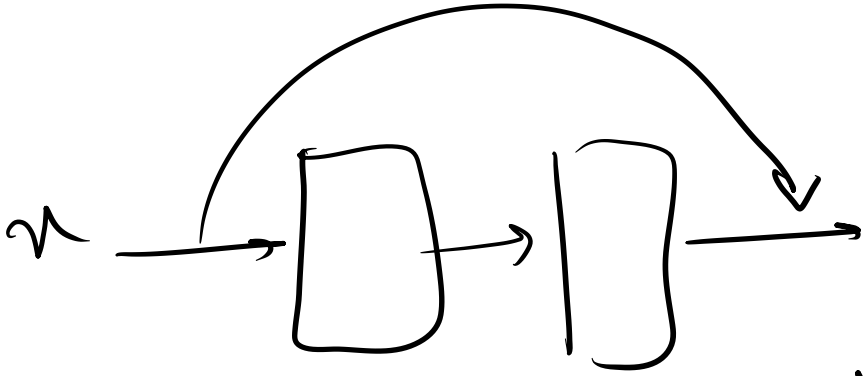
ResNet 2014

ResNet
18
50
101
~





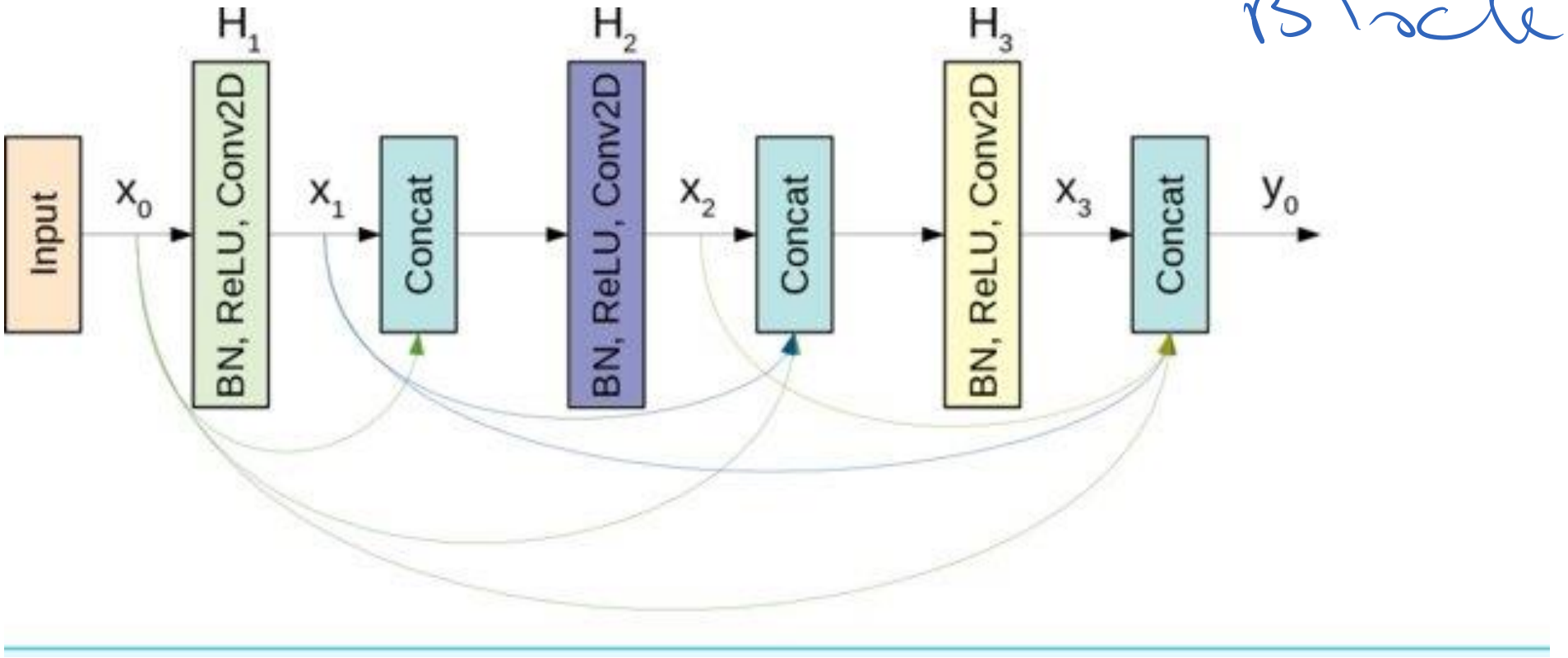




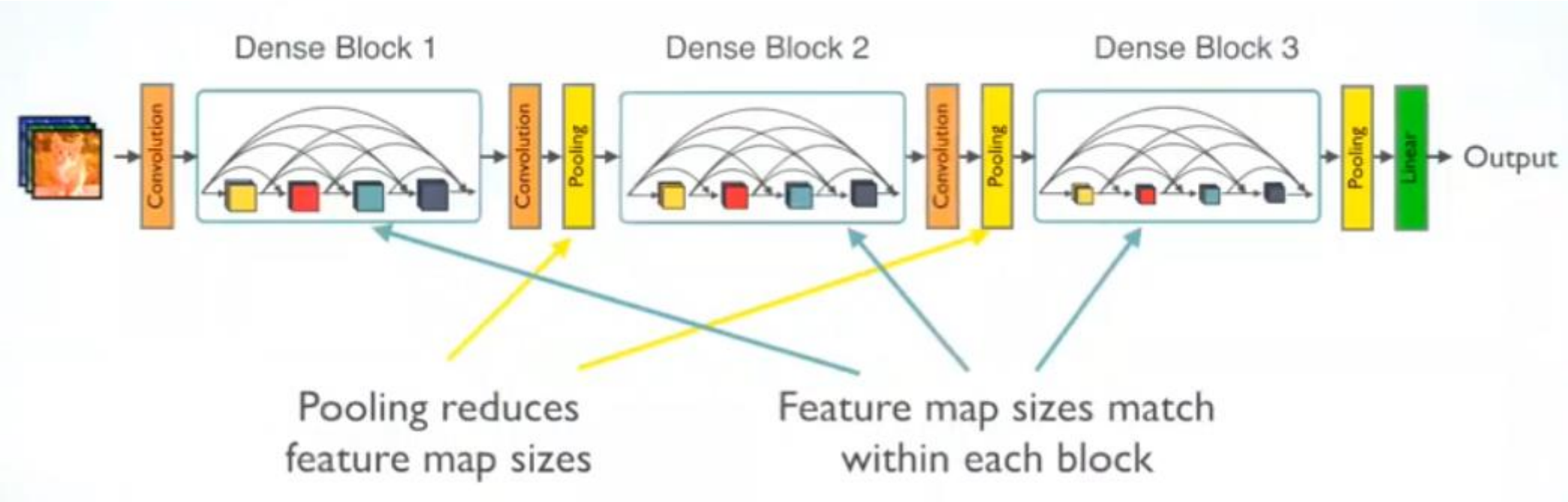
$$H(x) = x + F(x)$$

DenseNet 2017

Dense Block



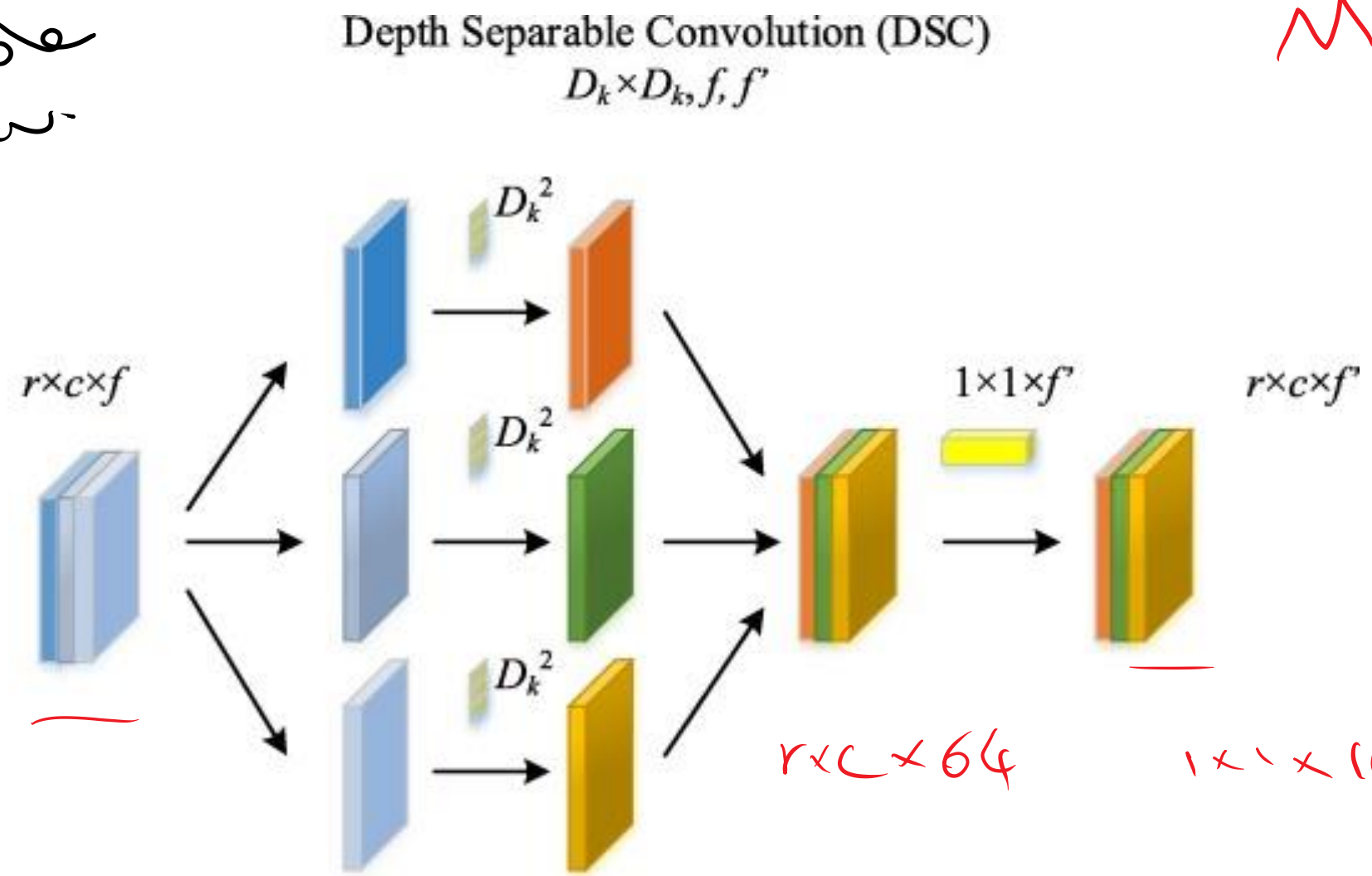
DenseNet


Dense Block 1
Dense Block 2
Dense Block 3
Convolution
Convolution
Pooling
Convolution
Pooling
Pooling
Linear
Output
Pooling reduces feature map sizes
Feature map sizes match within each block

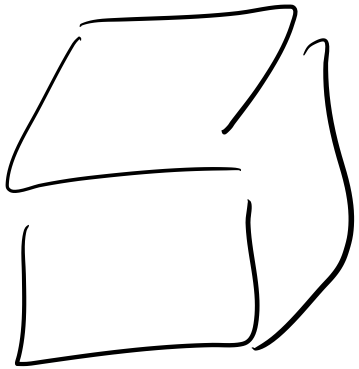
Depthwise Separable Conv.

MobileNet

2017



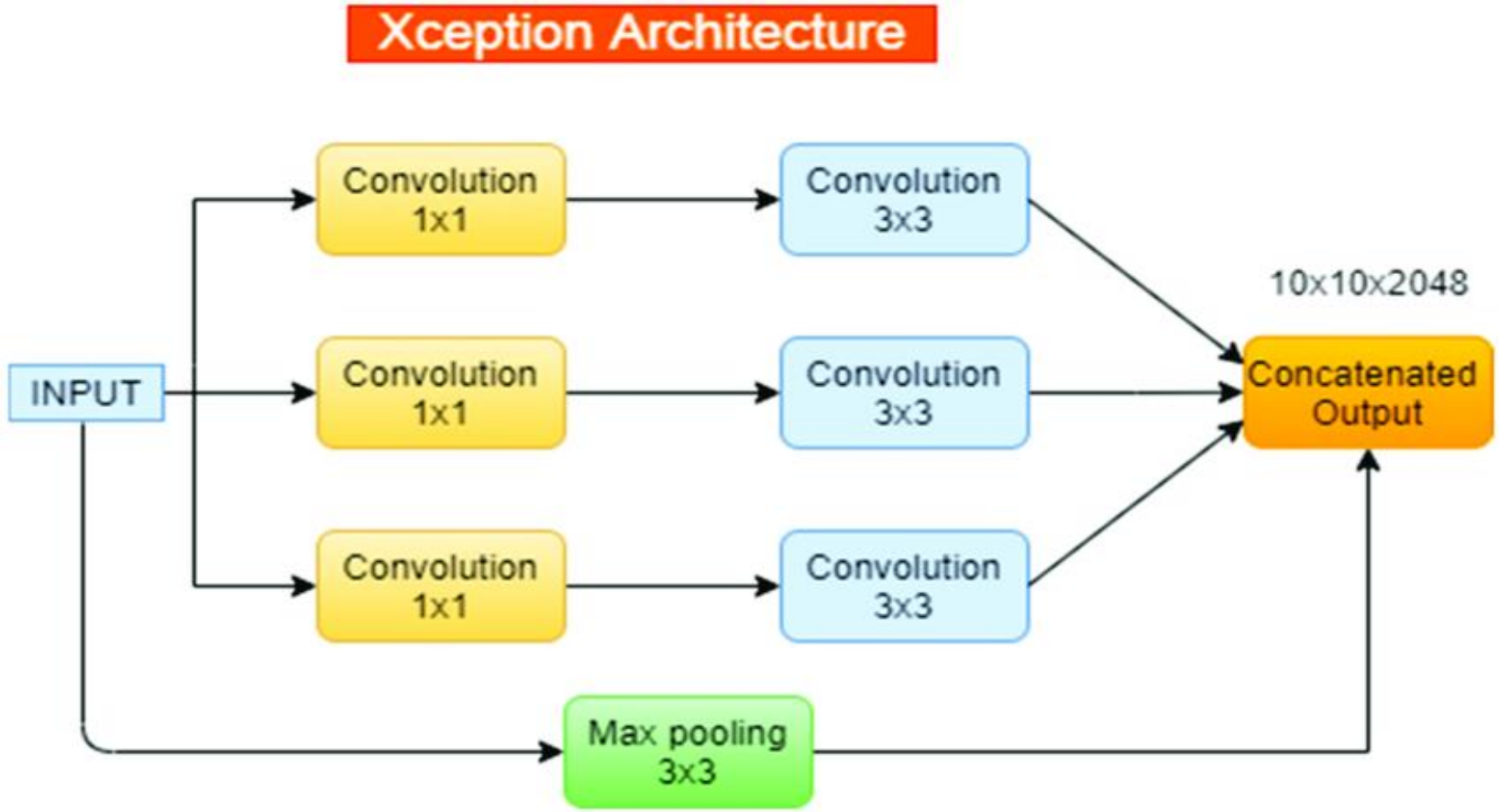
16 × 16 × 250

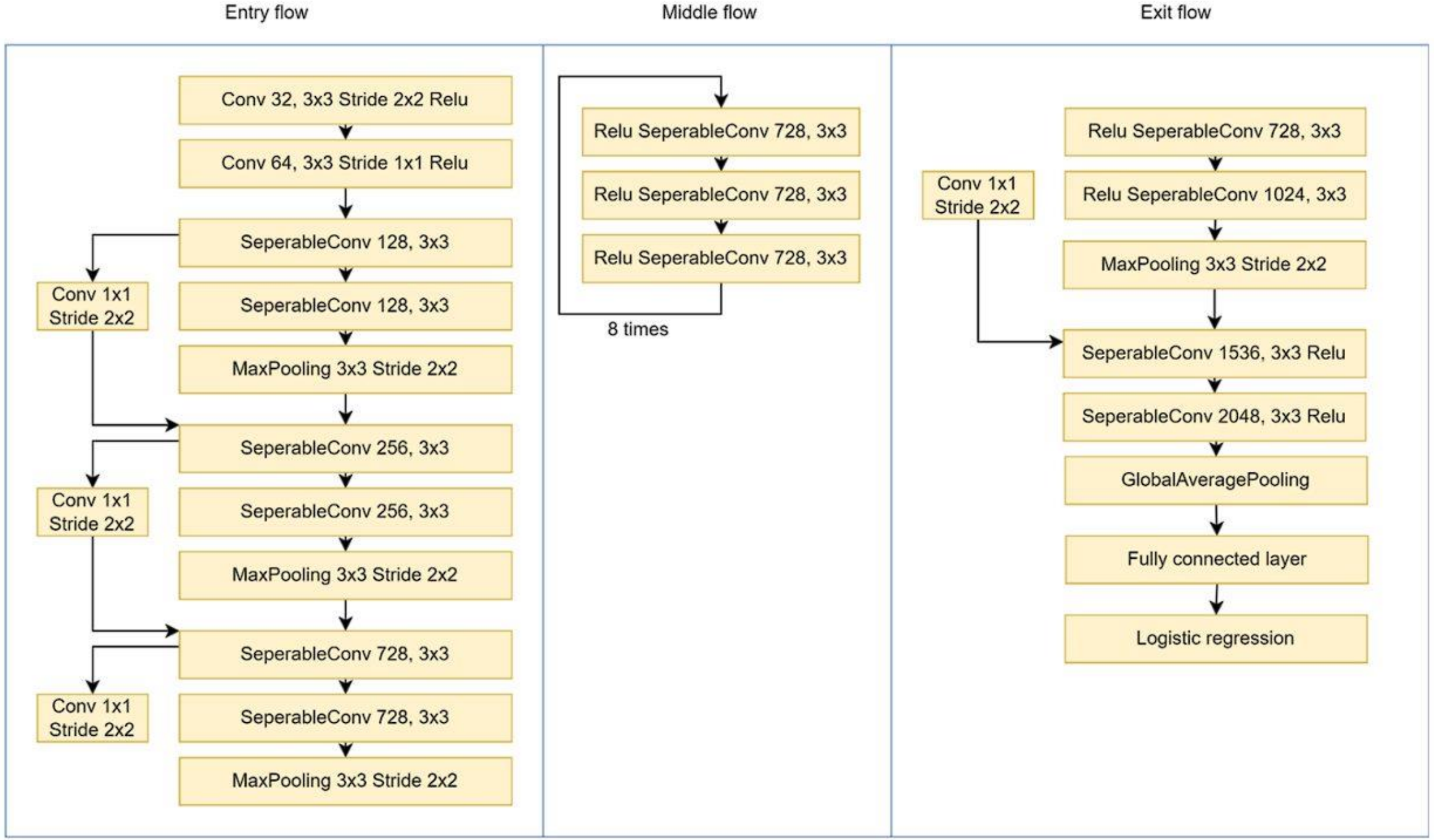


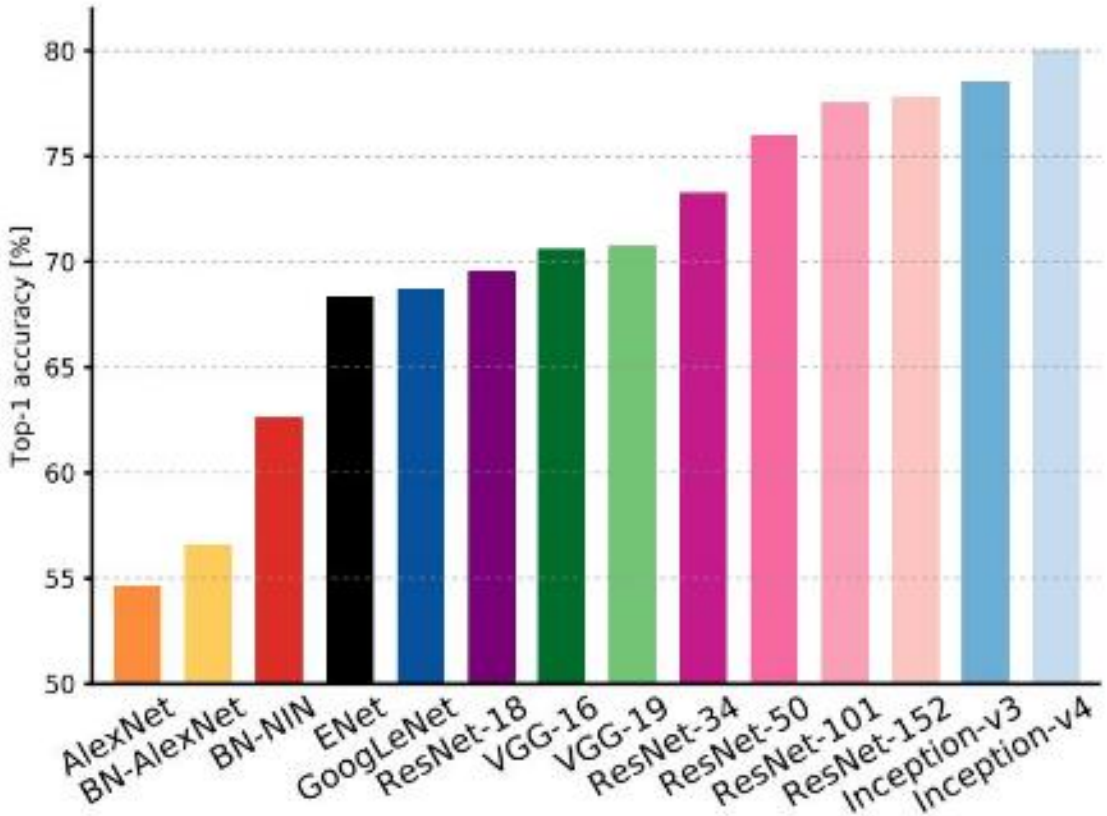
3 × 3 × 300

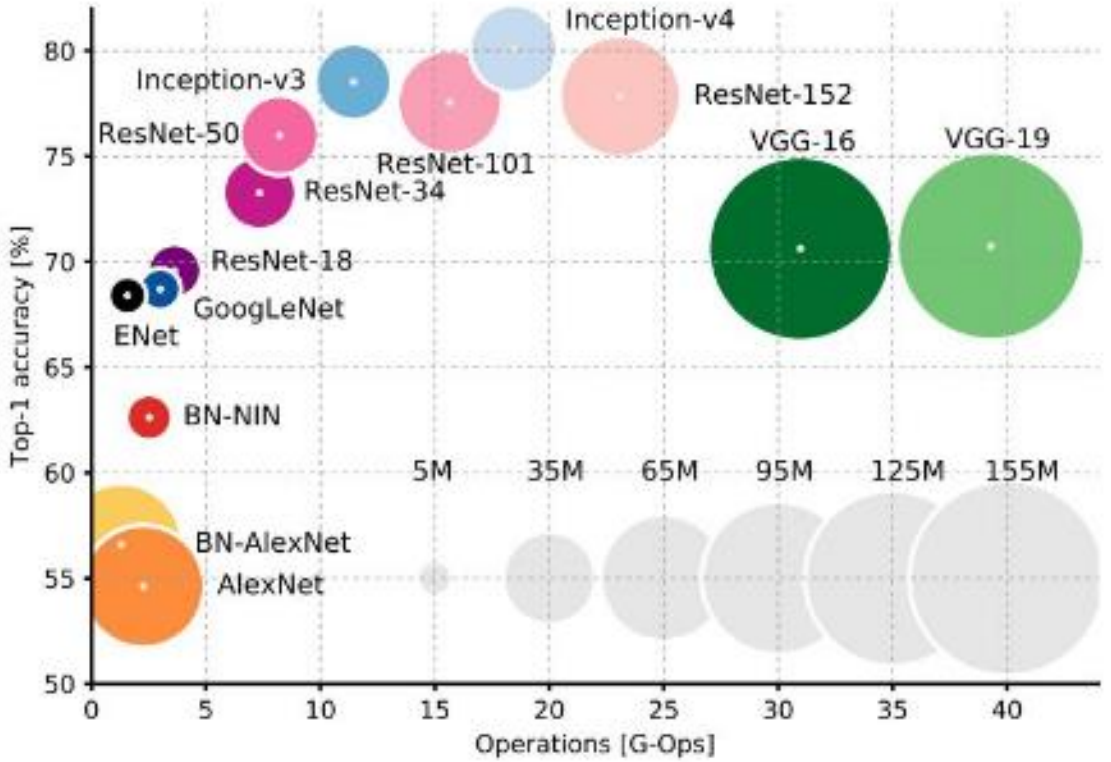
Conv

Xception 2017



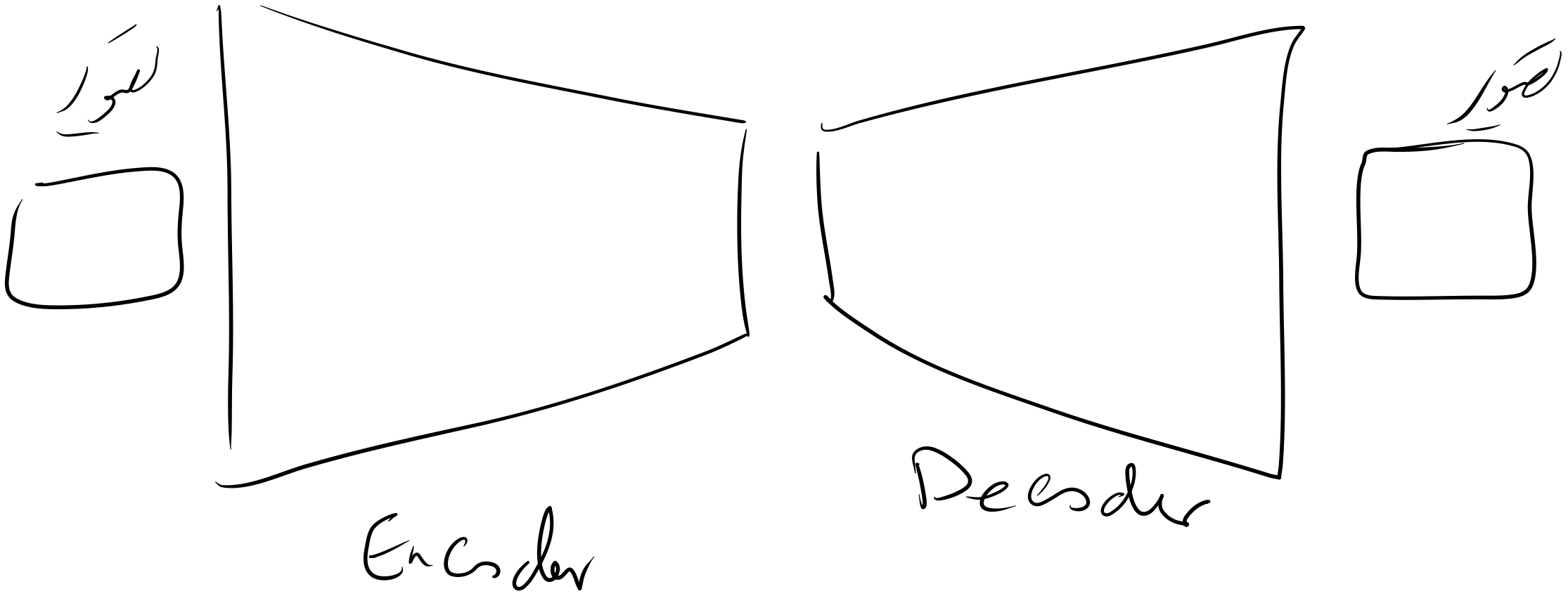

Entry flow
Middle flow
Exit flow
Conv 32, 3x3 Stride 2x2 Relu
Conv 64, 3x3 Stride 1x1 Relu
SeperableConv 128, 3x3
SeperableConv 128, 3x3
MaxPooling 3x3 Stride 2x2
Conv 1x1 Stride 2x2
SeperableConv 256, 3x3
SeperableConv 256, 3x3
MaxPooling 3x3 Stride 2x2
Conv 1x1 Stride 2x2
SeperableConv 728, 3x3
SeperableConv 728, 3x3
MaxPooling 3x3 Stride 2x2
Conv 1x1 Stride 2x2
Relu SeperableConv 728, 3x3
Relu SeperableConv 728, 3x3
Relu SeperableConv 728, 3x3
8 times
Relu SeperableConv 728, 3x3
Relu SeperableConv 1024, 3x3
MaxPooling 3x3 Stride 2x2
SeperableConv 1536, 3x3 Relu
SeperableConv 2048, 3x3 Relu
GlobalAveragePooling
Fully connected layer
Logistic regression

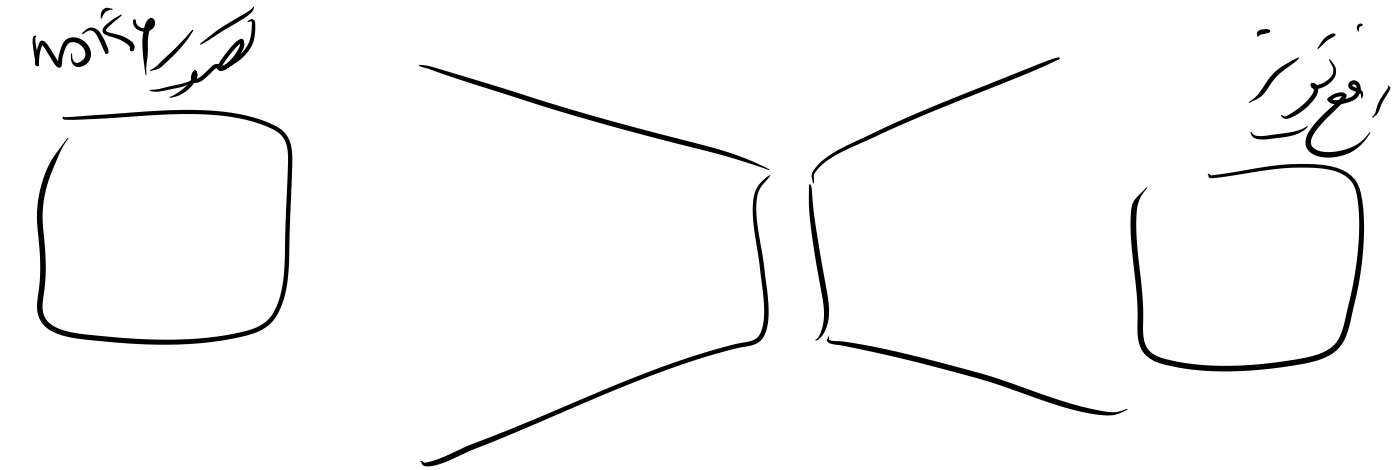


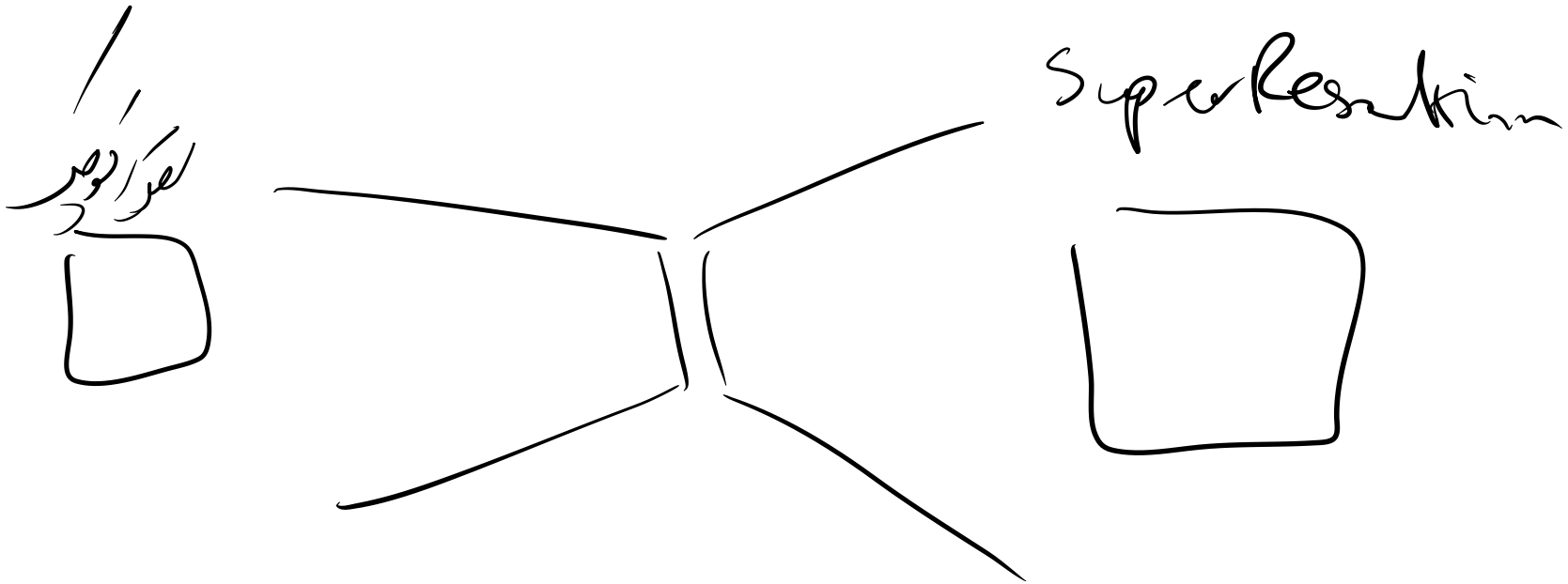


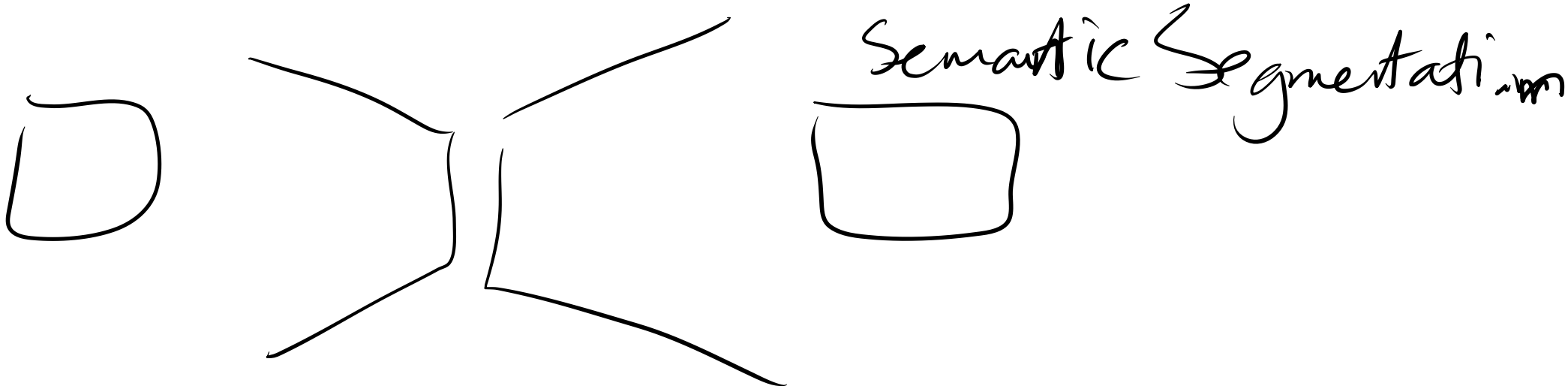
An Analysis of Deep Neural Network Models for Practical Applications, 2017.

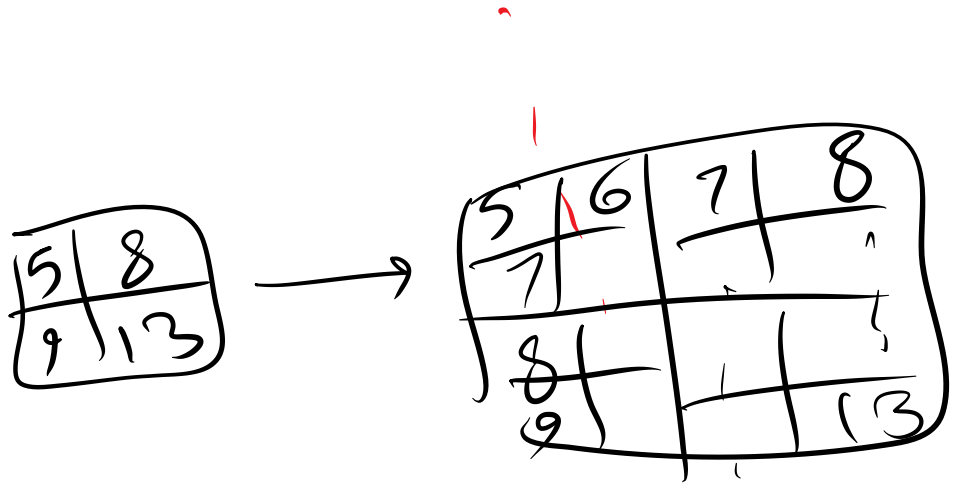
CNN Auto Encoder

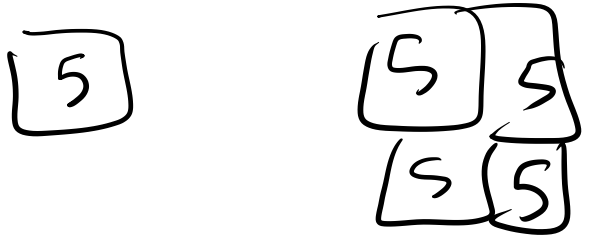


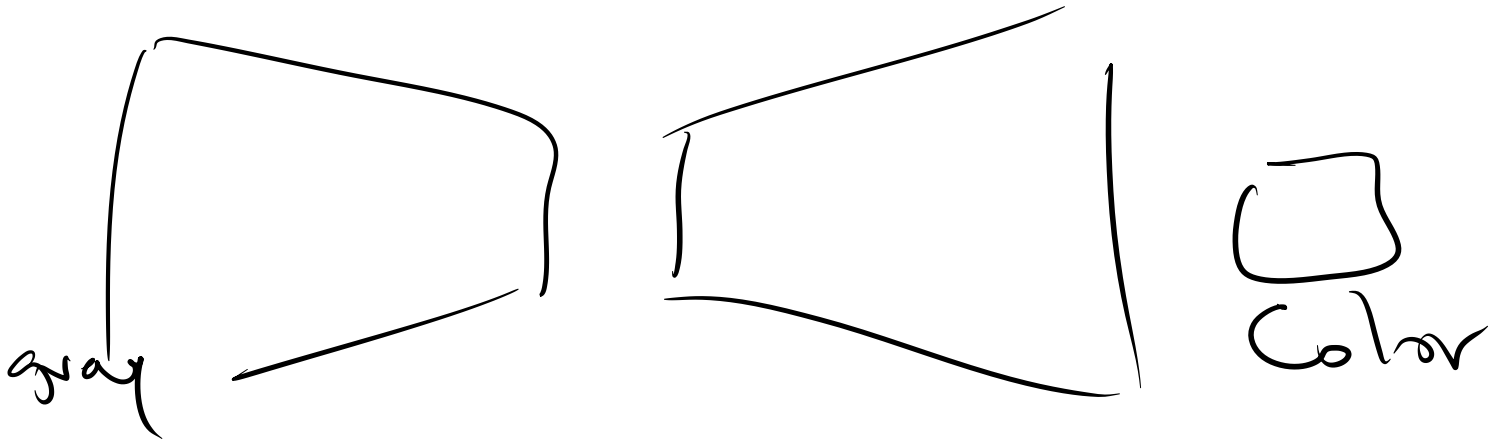



SuperResolution


Semantic Segmentation


5 8
9 13
5 6 7 8
7
8
9
13


5
5 5
5 5


gray
Color