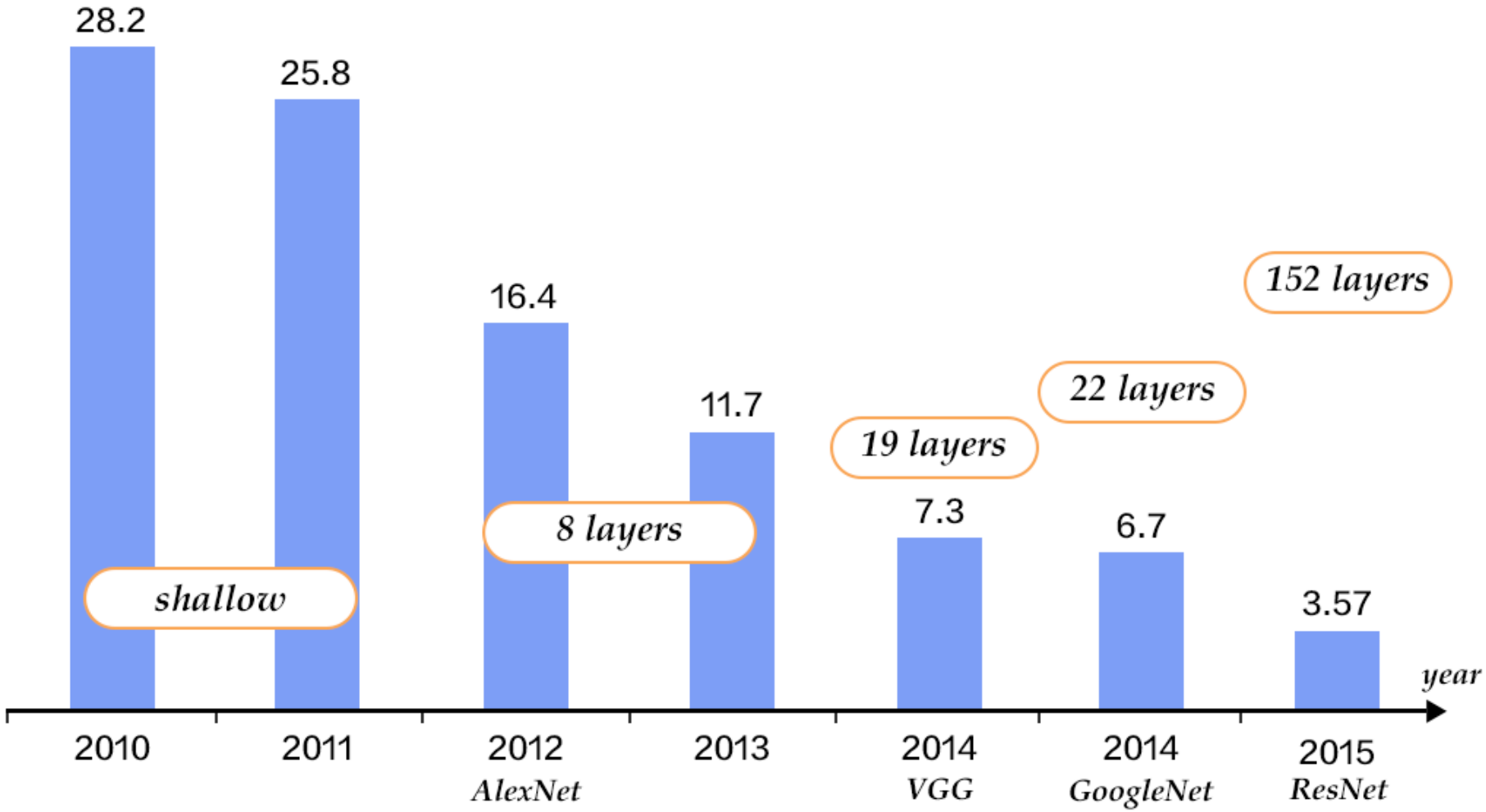
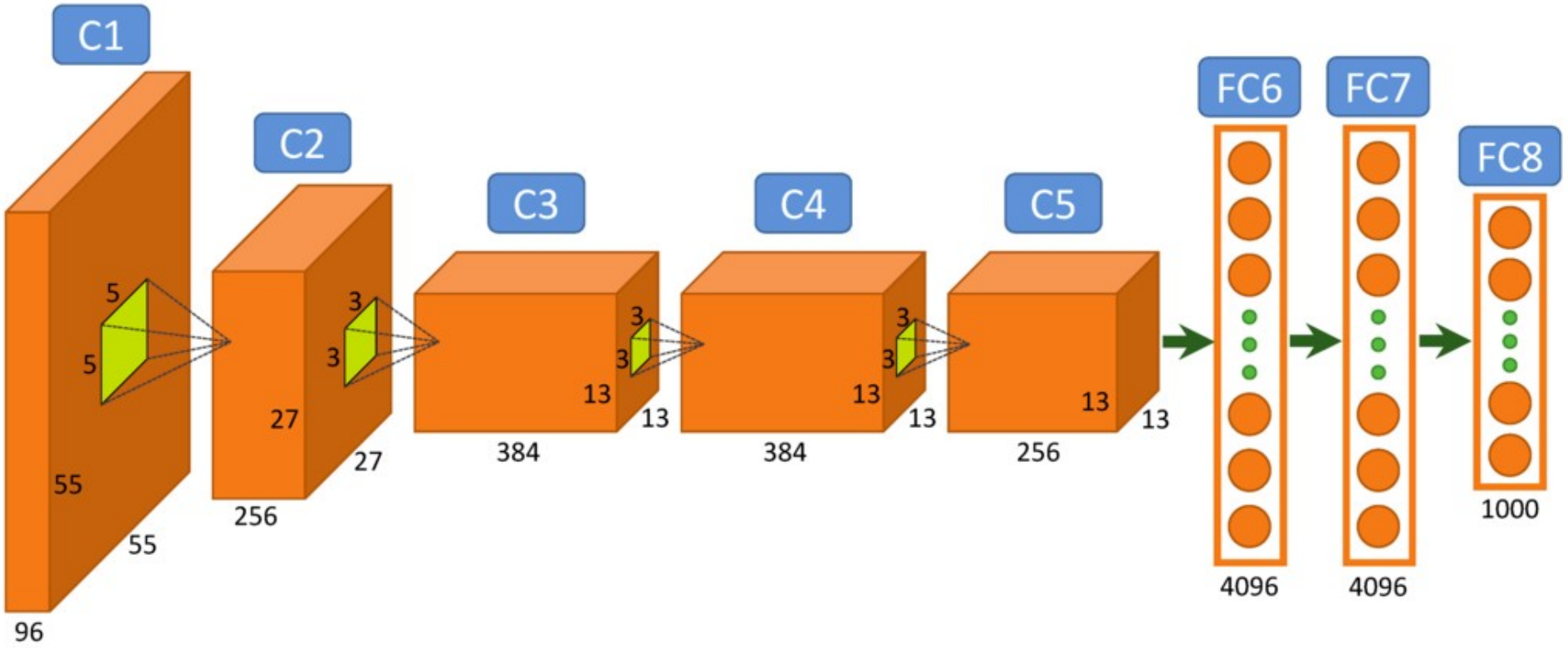
AlexNet

ILSVRC


28.2
25.8
16.4
11.7
7.3
6.7
3.57
shallow
8 layers
19 layers
22 layers
152 layers
year
2010
2011
2012
AlexNet
2013
2014
VGG
2014
GoogleNet
2015
ResNet

Архитектура

AlexNet


C1
C2
C3
C4
C5
FC6
FC7
FC8
5
5
55
55
96
3
3
27
27
256
3
3
13
13
384
3
3
13
13
384
13
13
256
4096
4096
1000

GPU

Строительные блоки

Строительные блоки

Convolution

ReLU

Pooling

CrossChanel Normalization

Строительные блоки

- Convolution
- ReLU
- Pooling
- CrossChanel Normalization
- FullyConnected
- Dropout

Строительные блоки

Convolution

ReLU

Pooling

CrossChanel Normalization

FullyConnected

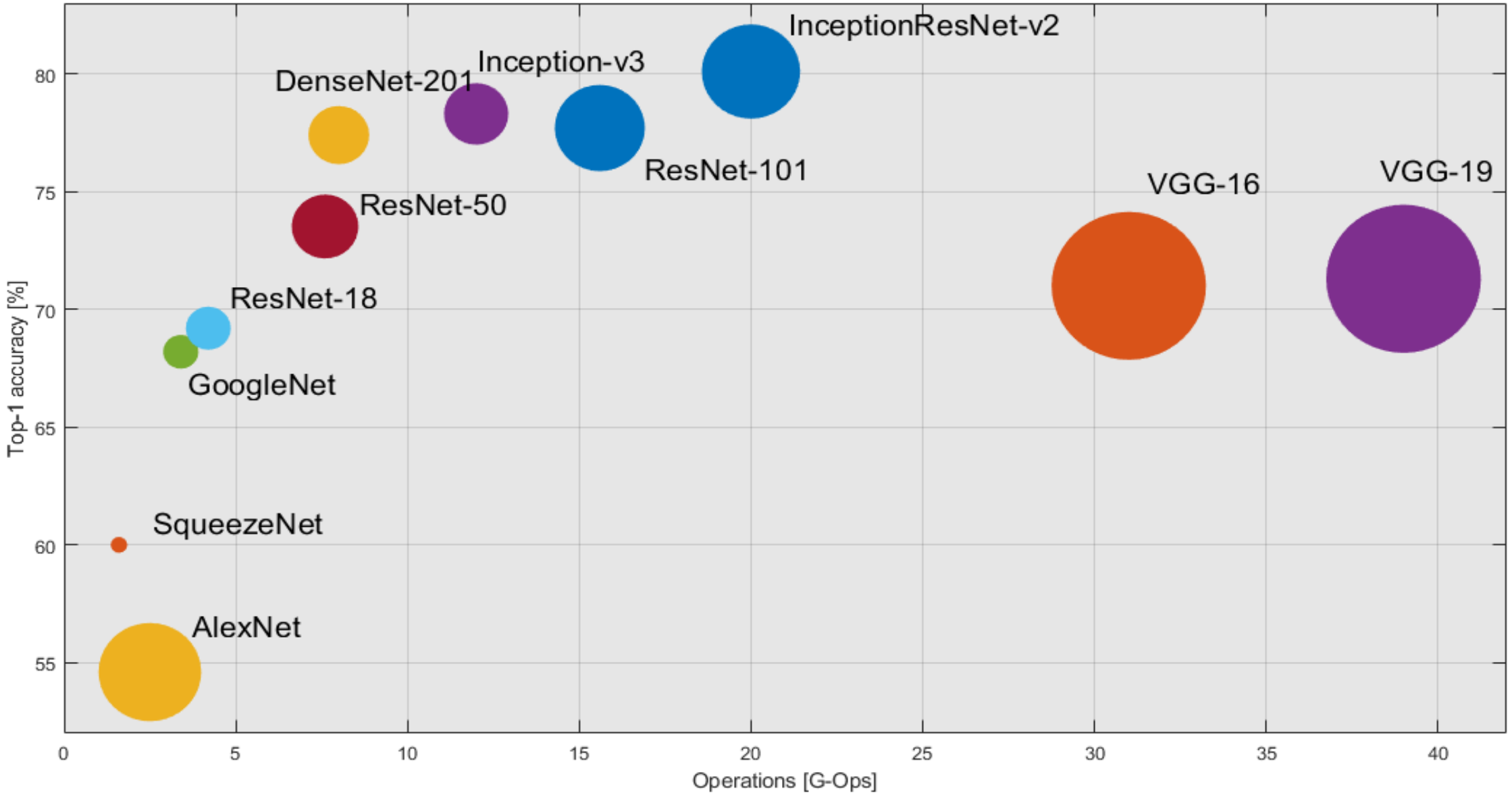
Dropout

Input

Softmax

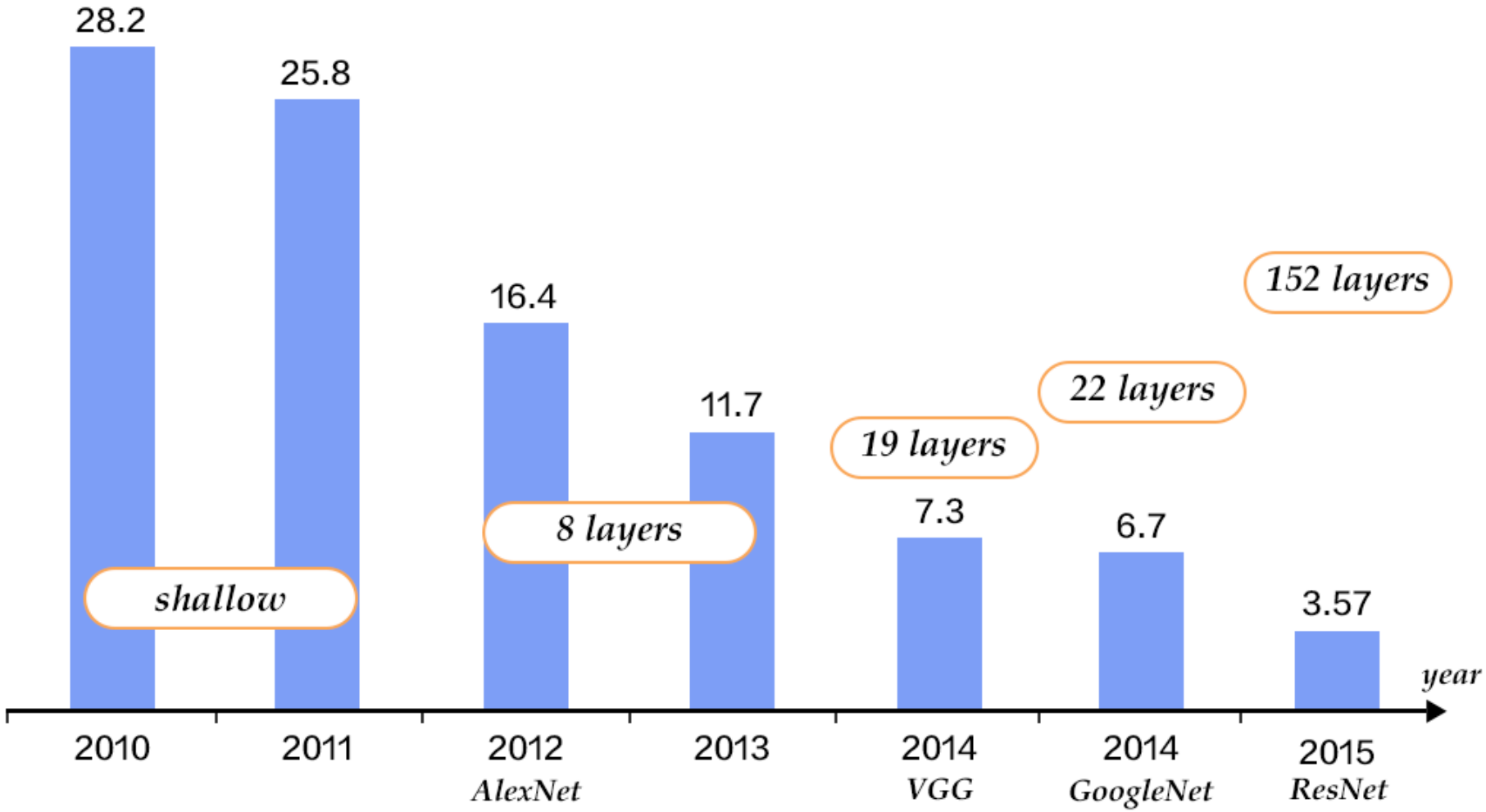
Classification

Доступные сети



VGG - 16 (19)

ILSVRC


28.2
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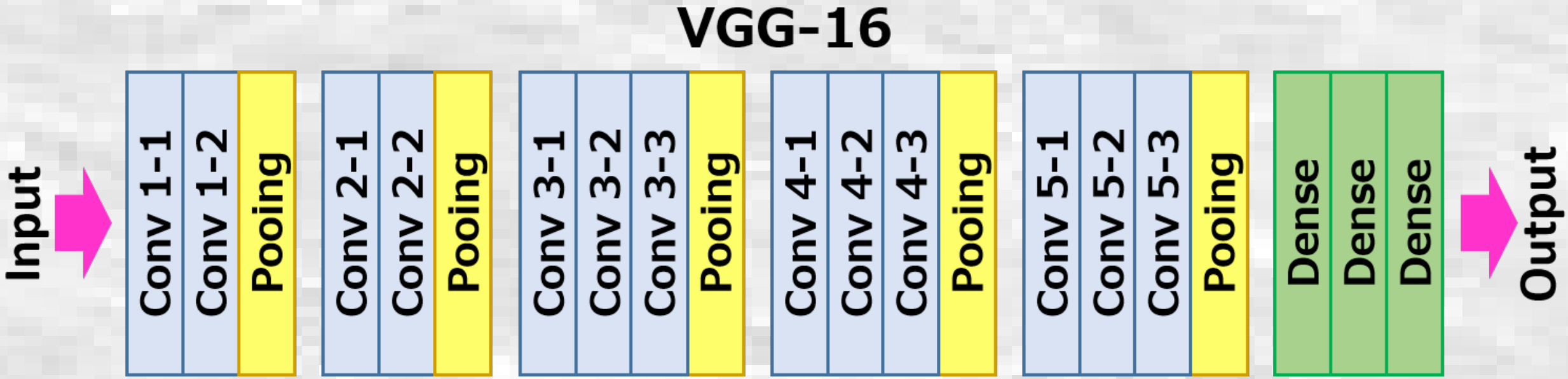
shallow
8 layers
19 layers
22 layers
152 layers
year
2010
2011
2012
AlexNet
2013
2014
VGG
2014
GoogleNet
2015
ResNet

Архитектура



Строительные блоки

Convolution

Input

FullyConnected

ReLU

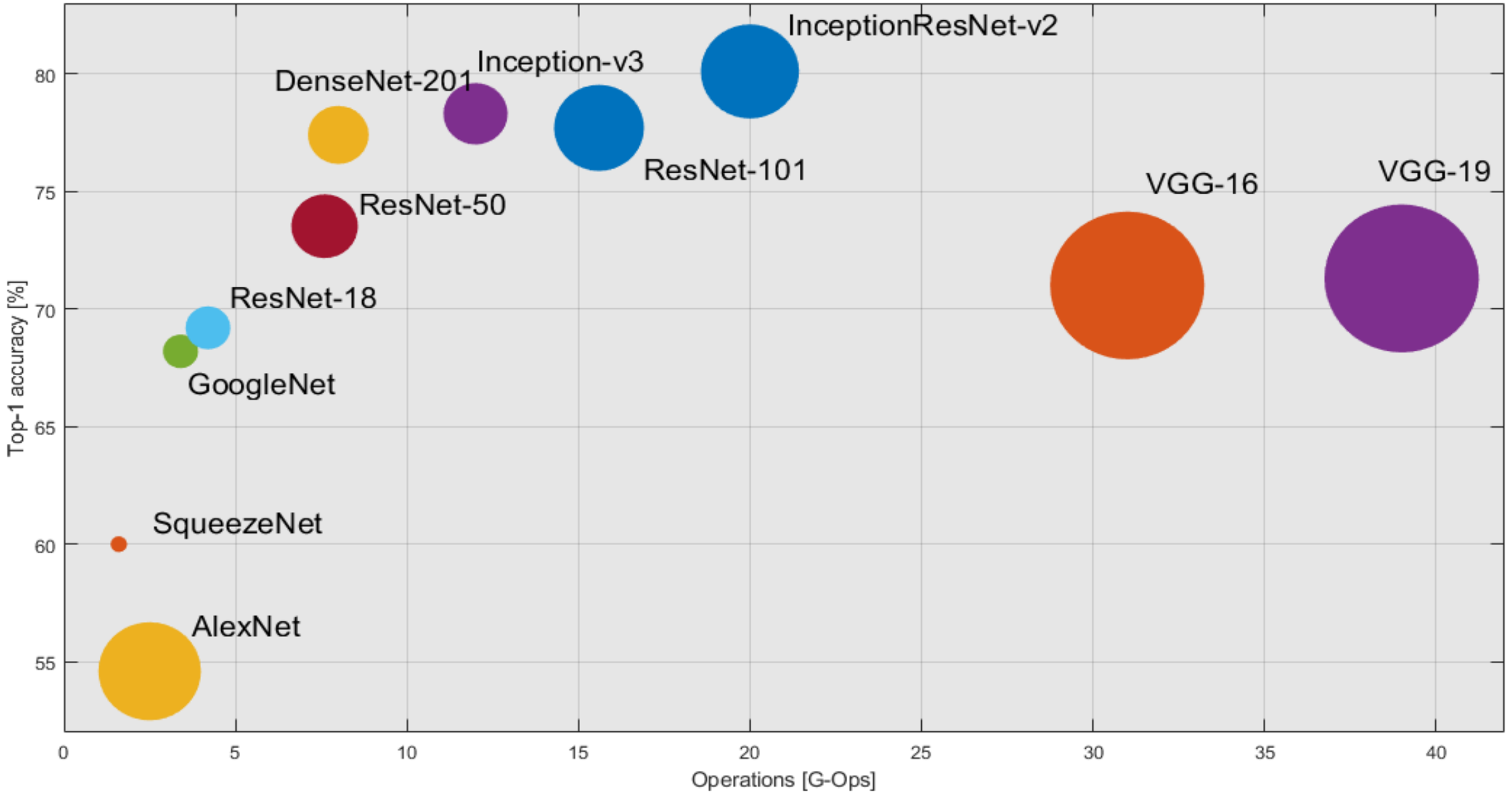
Softmax

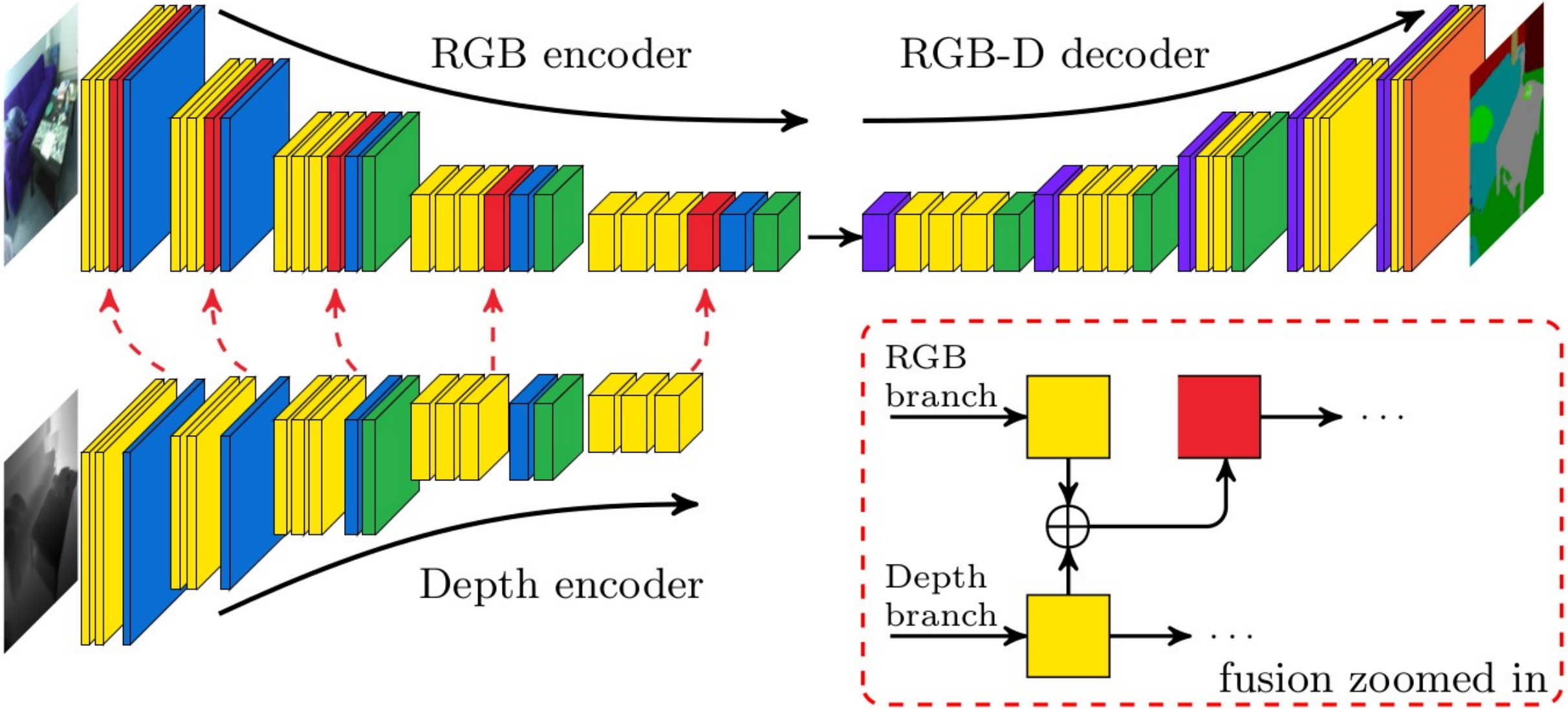
Dropout

Pooling

Classification

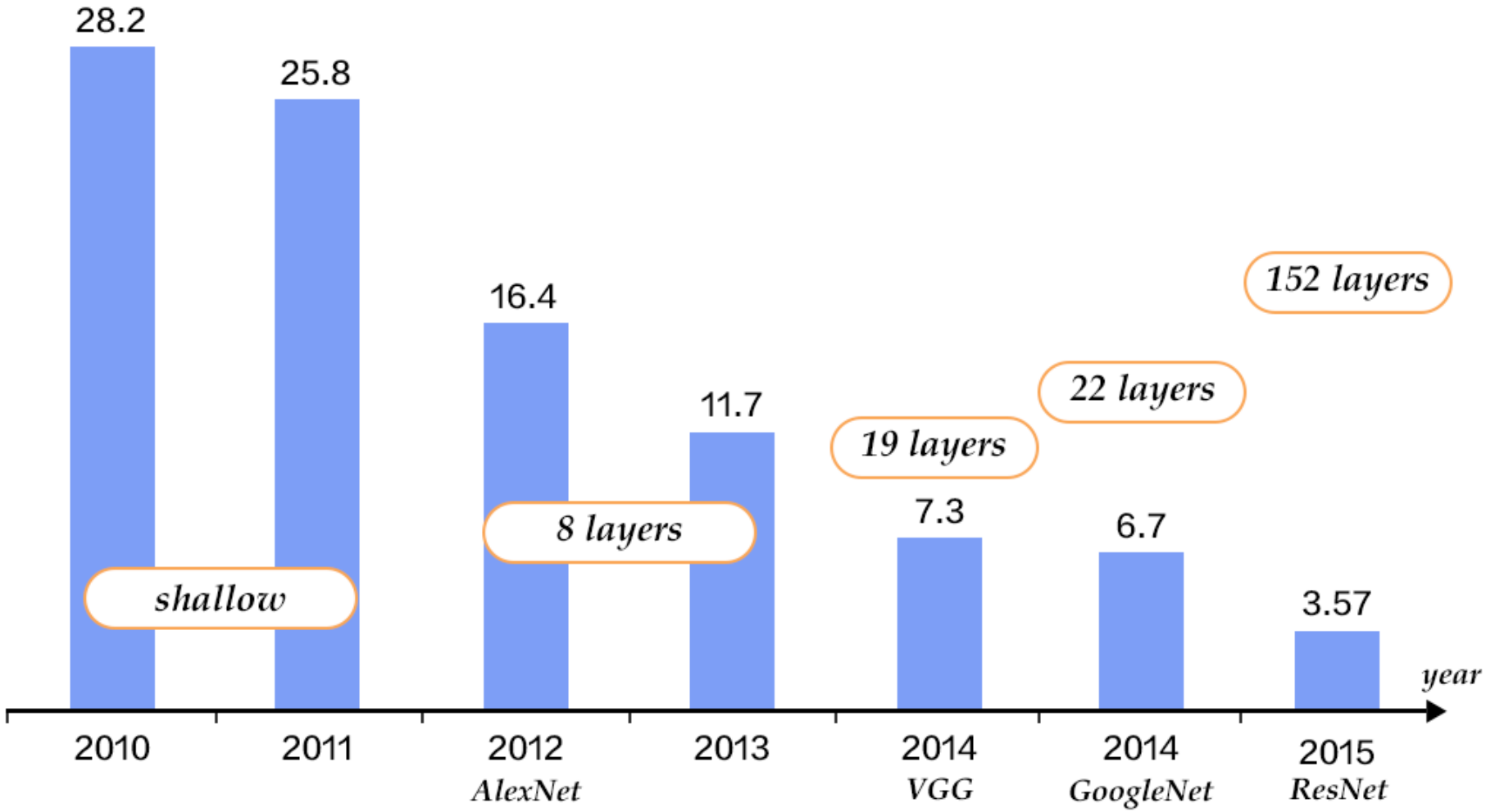
Доступные сети



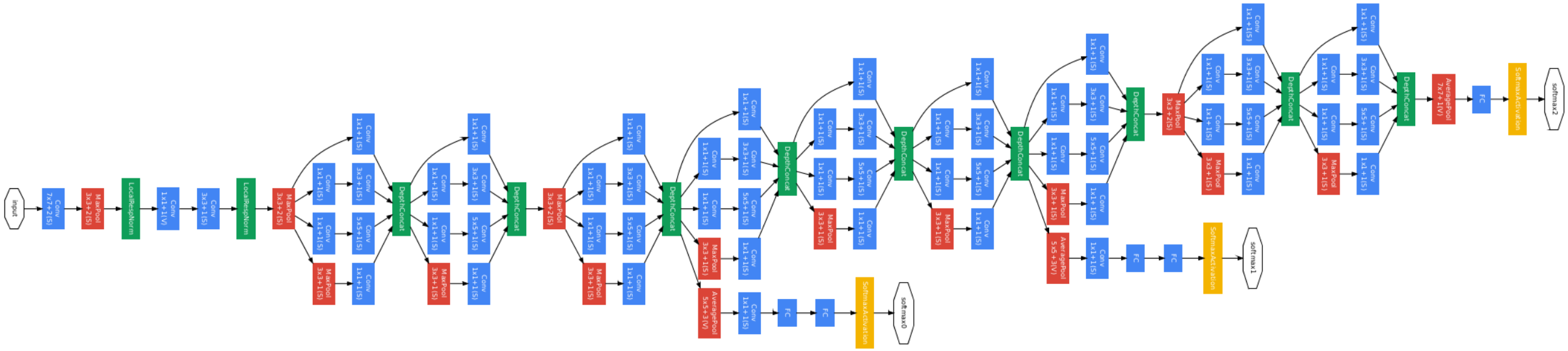

RGB encoder
RGB-D decoder
Depth encoder
RGB branch
Depth branch
fusion zoomed in
Conv+BN+ReLU (CBR)
Fusion
Dropout
Pooling
Unpooling
Score

GoogleNet

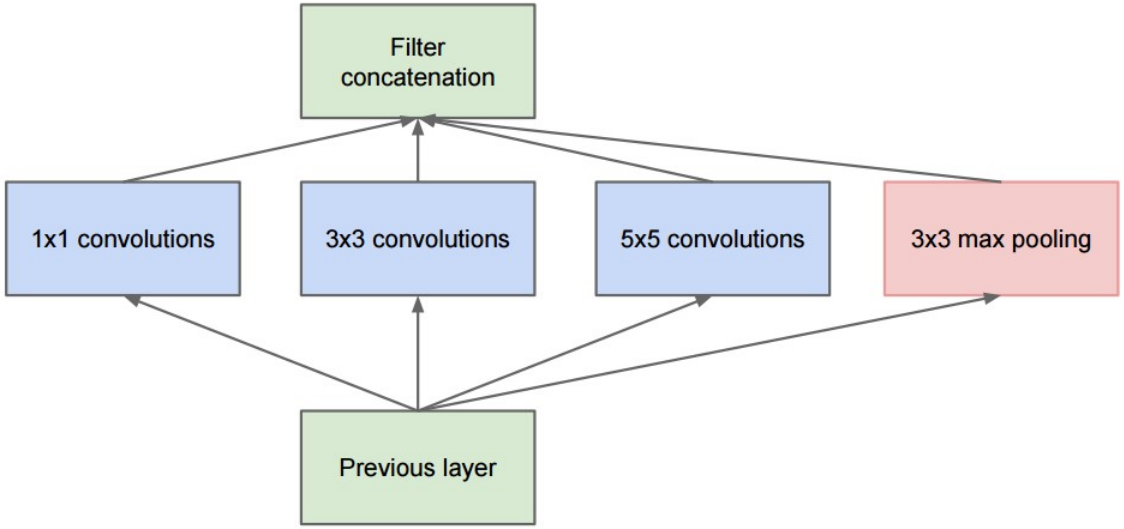
ILSVRC

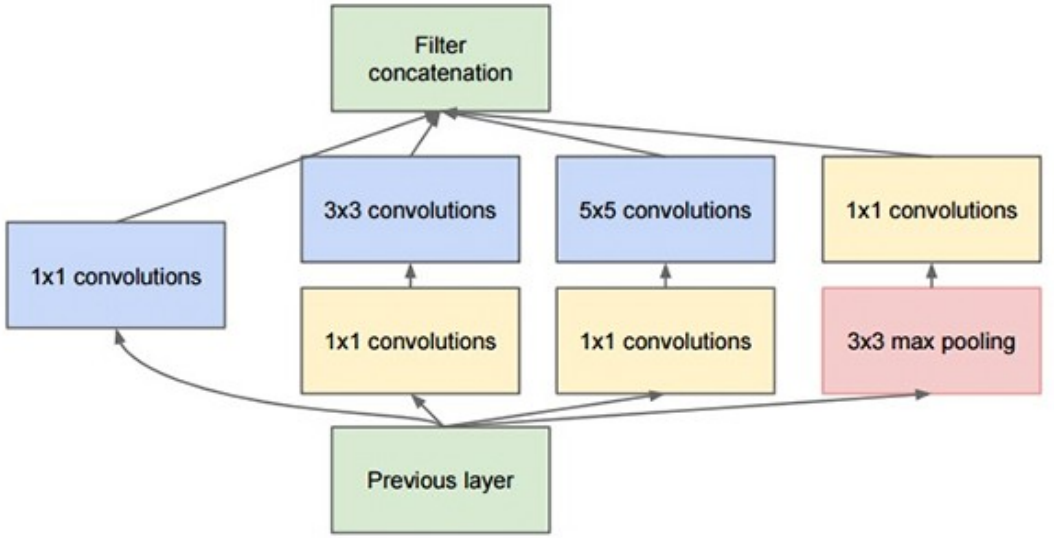

28.2
25.8
16.4
11.7
7.3
6.7
3.57
shallow
8 layers
19 layers
22 layers
152 layers
year
2010
2011
2012
AlexNet
2013
2014
VGG
2014
GoogleNet
2015
ResNet

Архитектура



GoogleNet (inception)





Строительные блоки

Строительные блоки

- Convolution
- ReLU
- Pooling
- CrossChanel Normalization

Строительные блоки

- Convolution
- ReLU
- Pooling
- CrossChanel Normalization
- FullyConnected
- Dropout

Строительные блоки

- Convolution
- ReLU
- Pooling
- CrossChanel Normalization
- FullyConnected
- Dropout
- Average Pooling

Строительные блоки

- Input
- FullyConnected
- ReLU
- Dropout
- Softmax
- Pooling
- Average Pooling
- CrossChanel Normalization
- Classification

Строительные блоки

Convolution

FullyConnected

Input

ReLU

Softmax

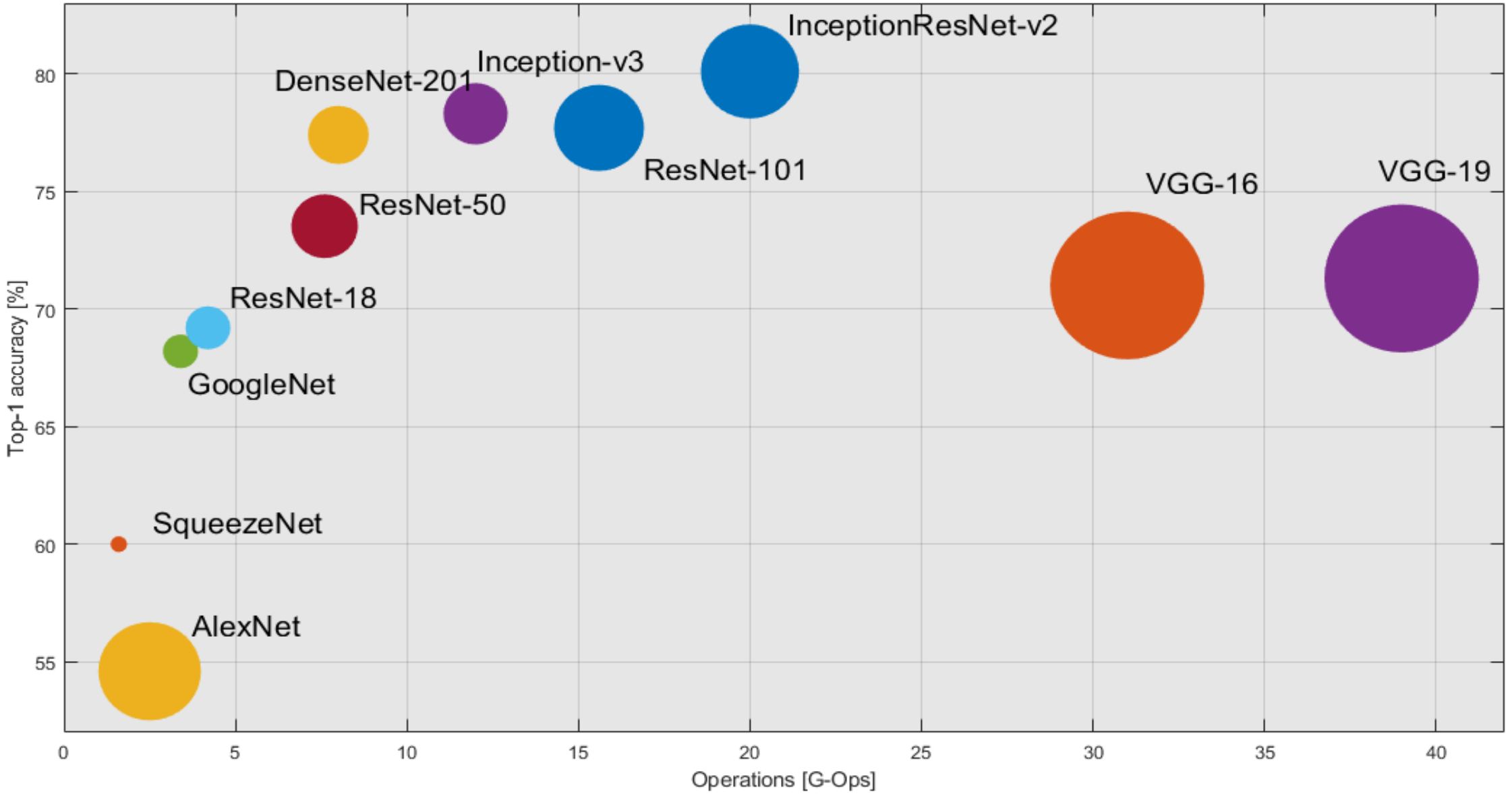
Average Pooling

CrossChanel Normalization

Classification

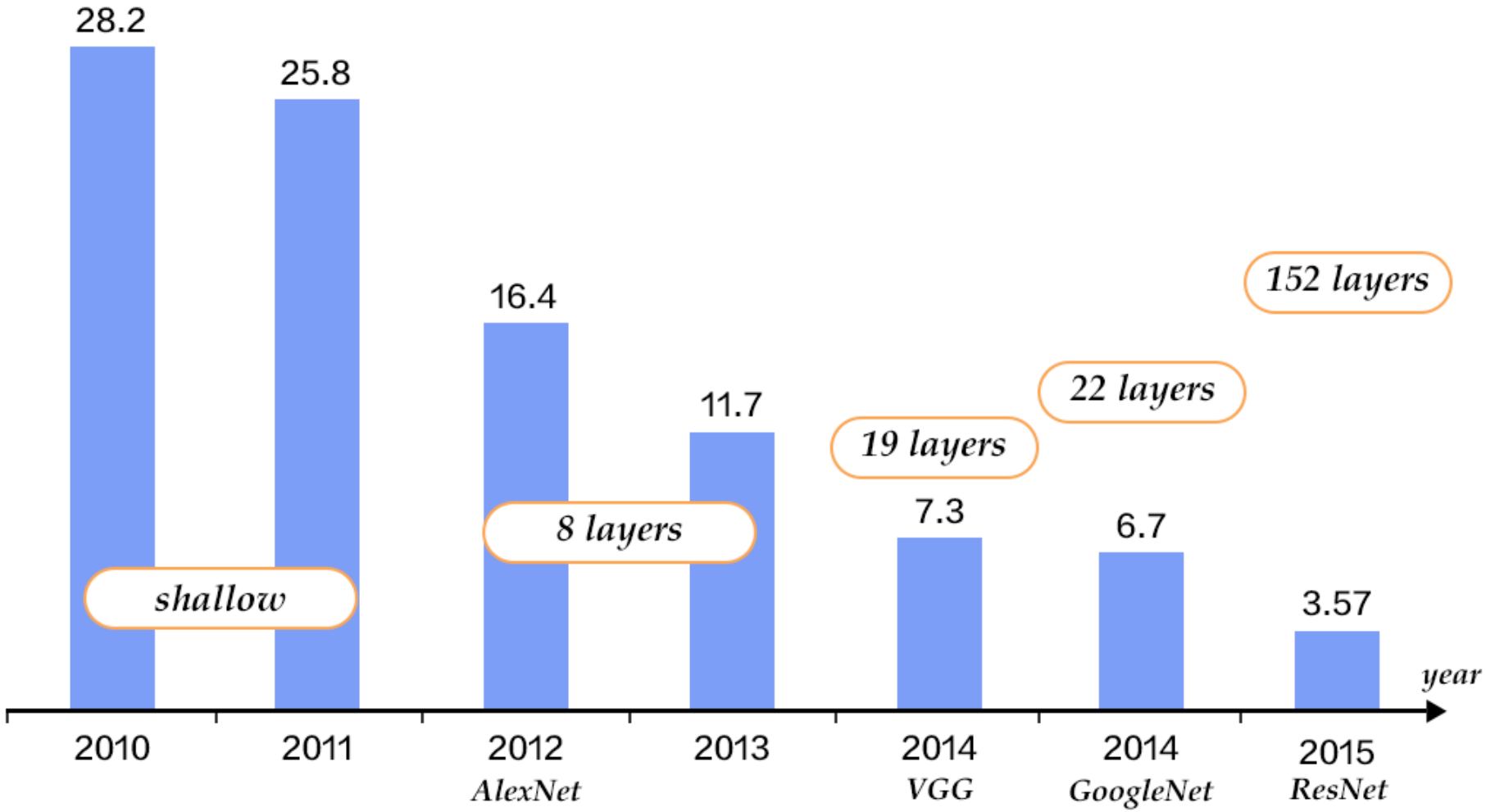
DepthConcatenation

Доступные сети

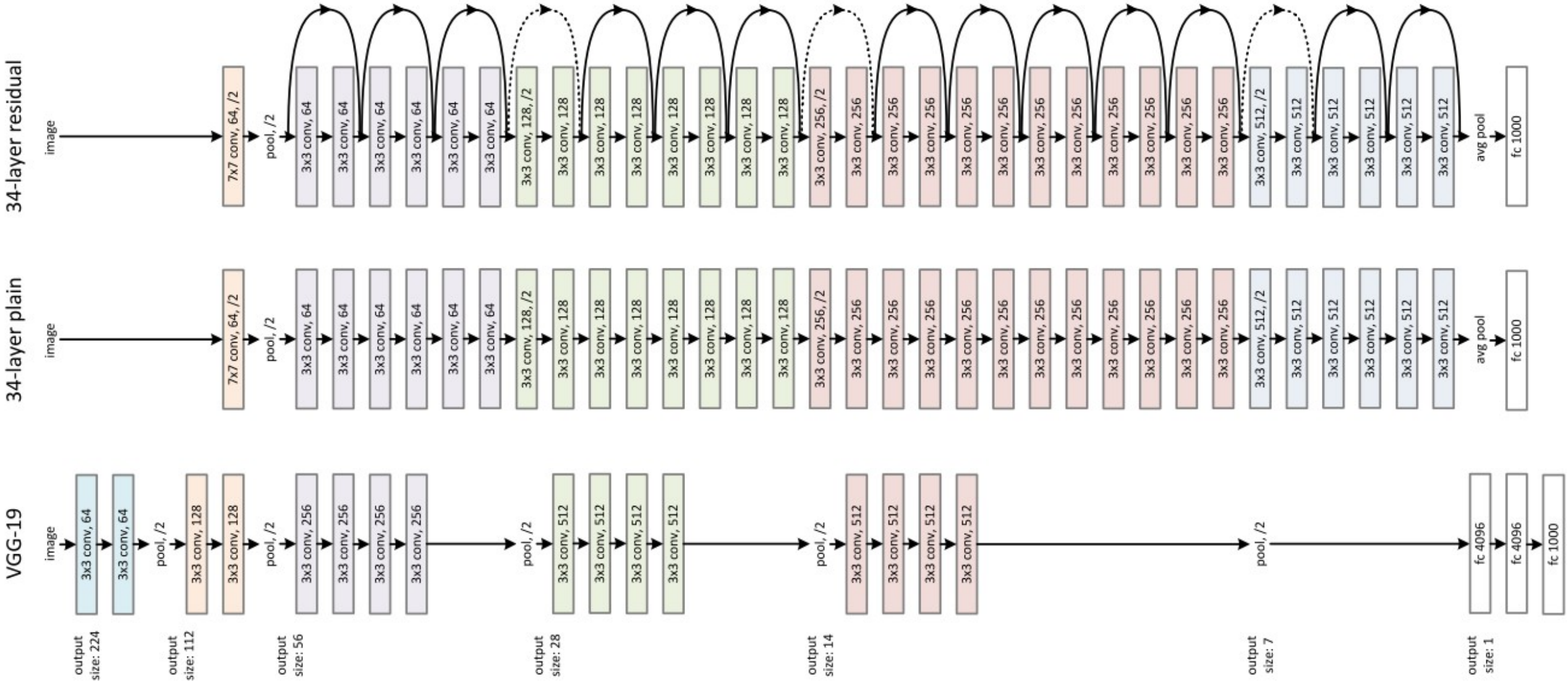


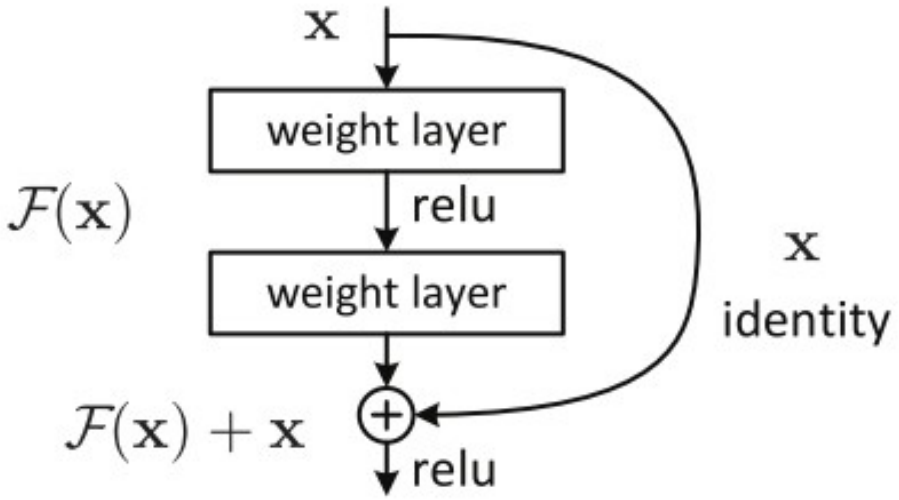
ResNet

ILSVRC


28.2
25.8
16.4
11.7
7.3
6.7
3.57
shallow
8 layers
19 layers
22 layers
152 layers
year
2010
2011
2012
AlexNet
2013
2014
VGG
2014
GoogleNet
2015
ResNet

Архитектура




x
weight layer
$\mathcal{F}(\mathbf{x})$
relu
weight layer
x
identity
$\mathcal{F}(\mathbf{x}) + \mathbf{x}$
relu

Строительные блоки

Строительные блоки

- Convolution
- ReLU
- Pooling
- Batch Normalizetion

Строительные блоки

- Convolution
- ReLU
- Pooling
- Batch Normalizetion
- FullyConnected
- Dropout

Строительные блоки

- Convolution
- ReLU
- Pooling
- Batch Normalizetion
- FullyConnected
- Dropout
- Average Pooling

Строительные блоки

Convolution

ReLU

Pooling

Batch Normalizetion

FullyConnected

Dropout

Average Pooling

Input

Softmax

Classification

Строительные блоки

Convolution

ReLU

Pooling

Batch Normalizetion

FullyConnected

Dropout

Average Pooling

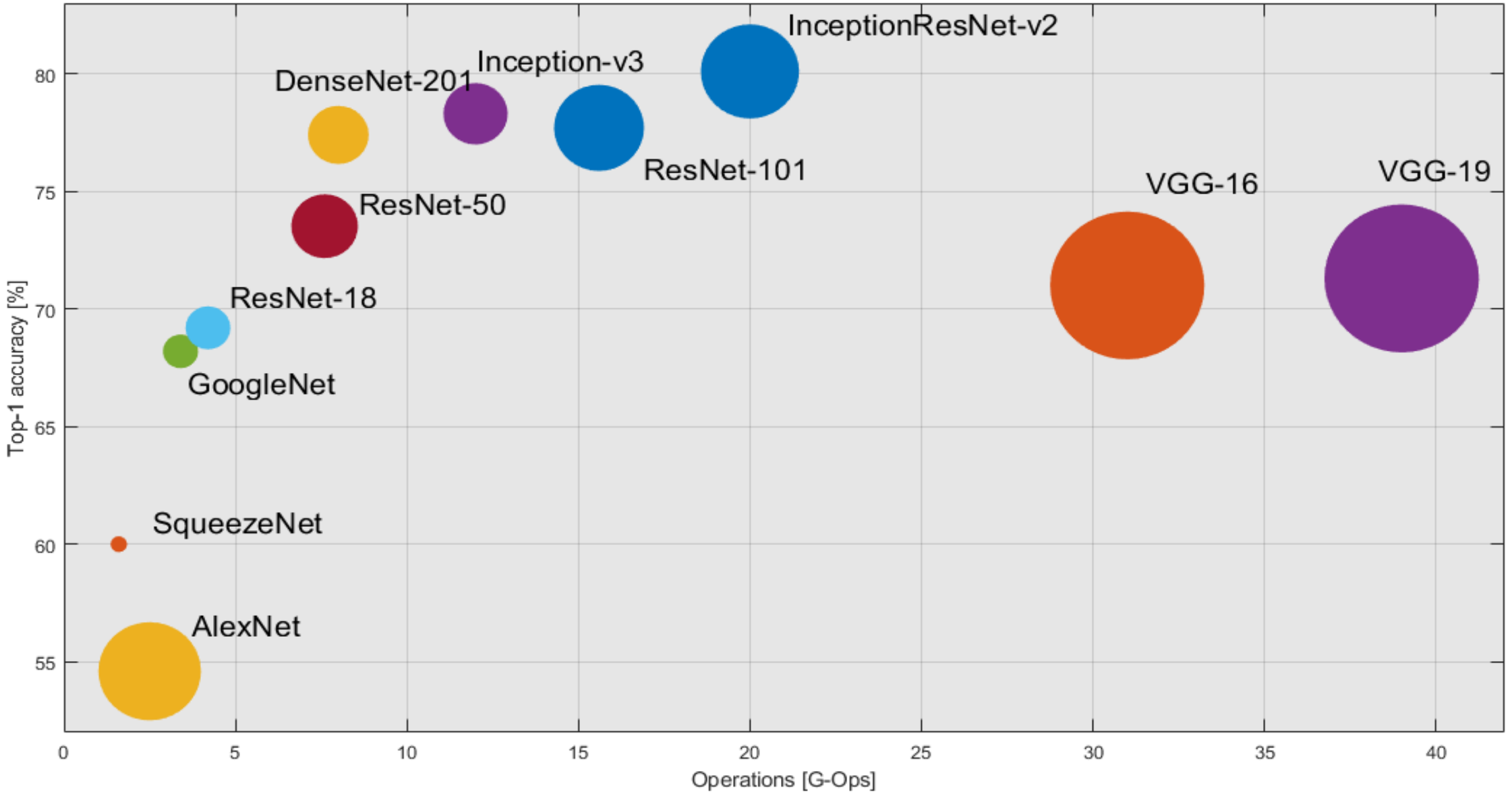
DepthConcatenation

Input

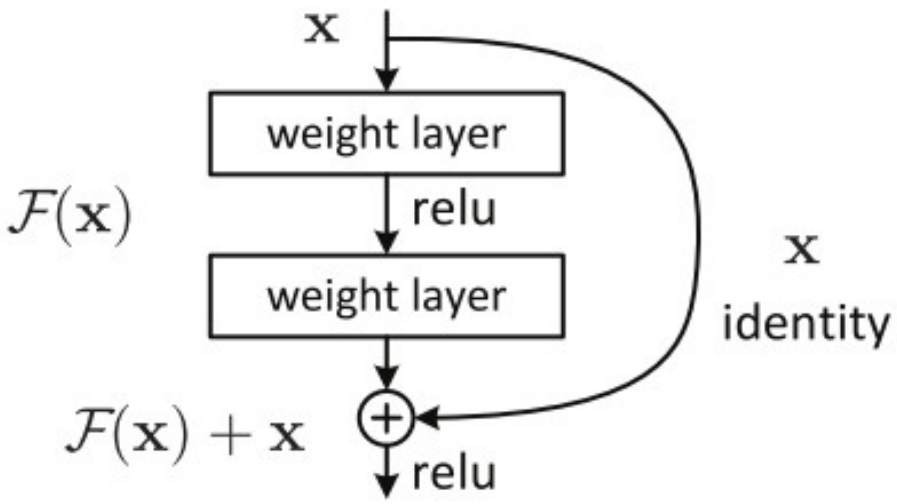
Softmax

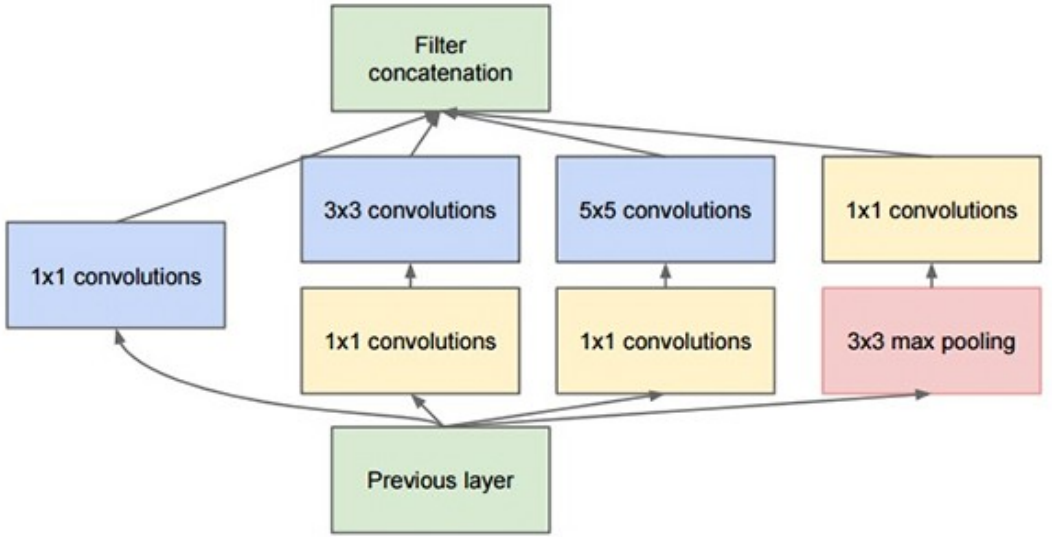
Classification

Доступные сети

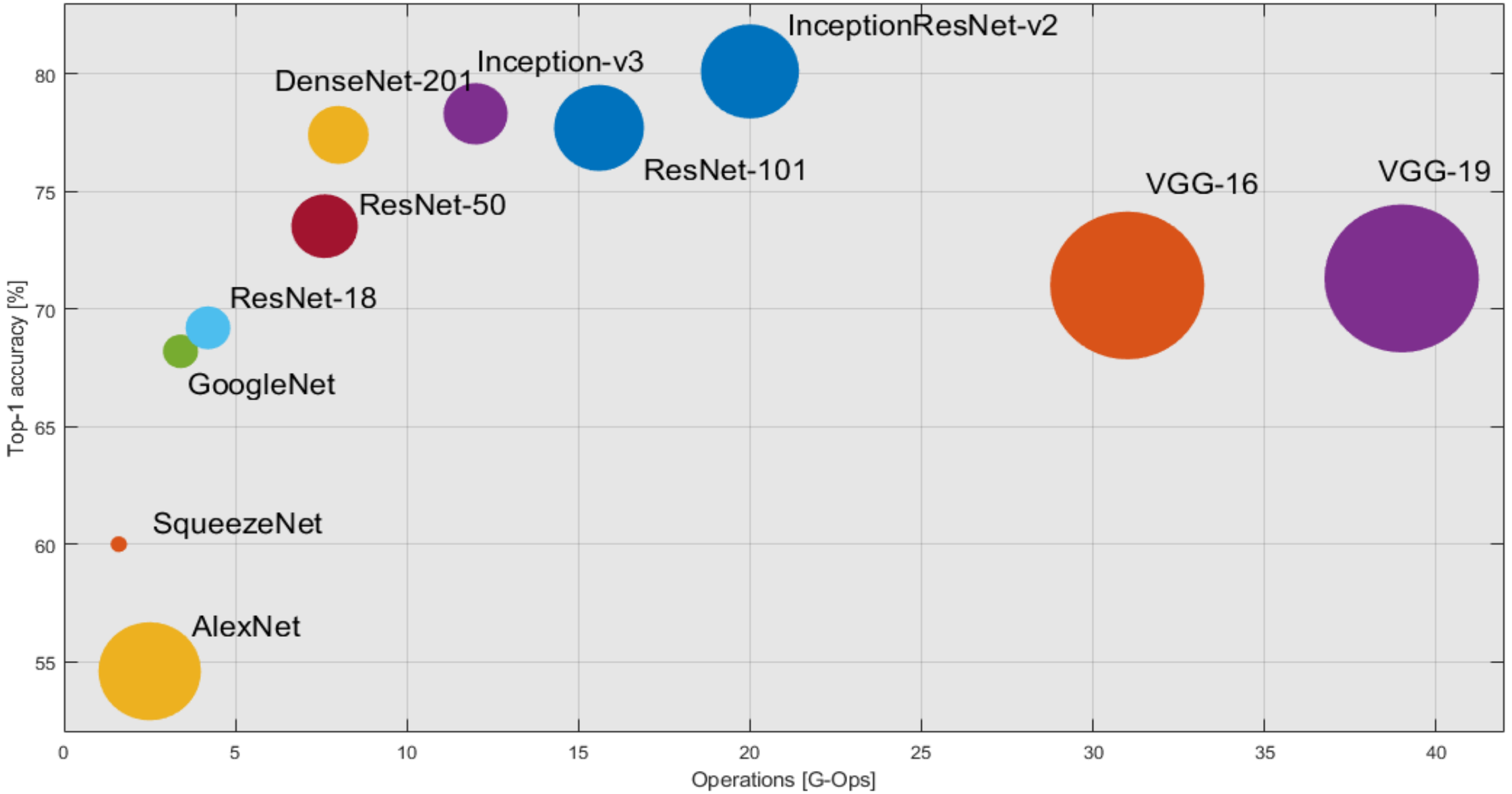


InceptionResNet

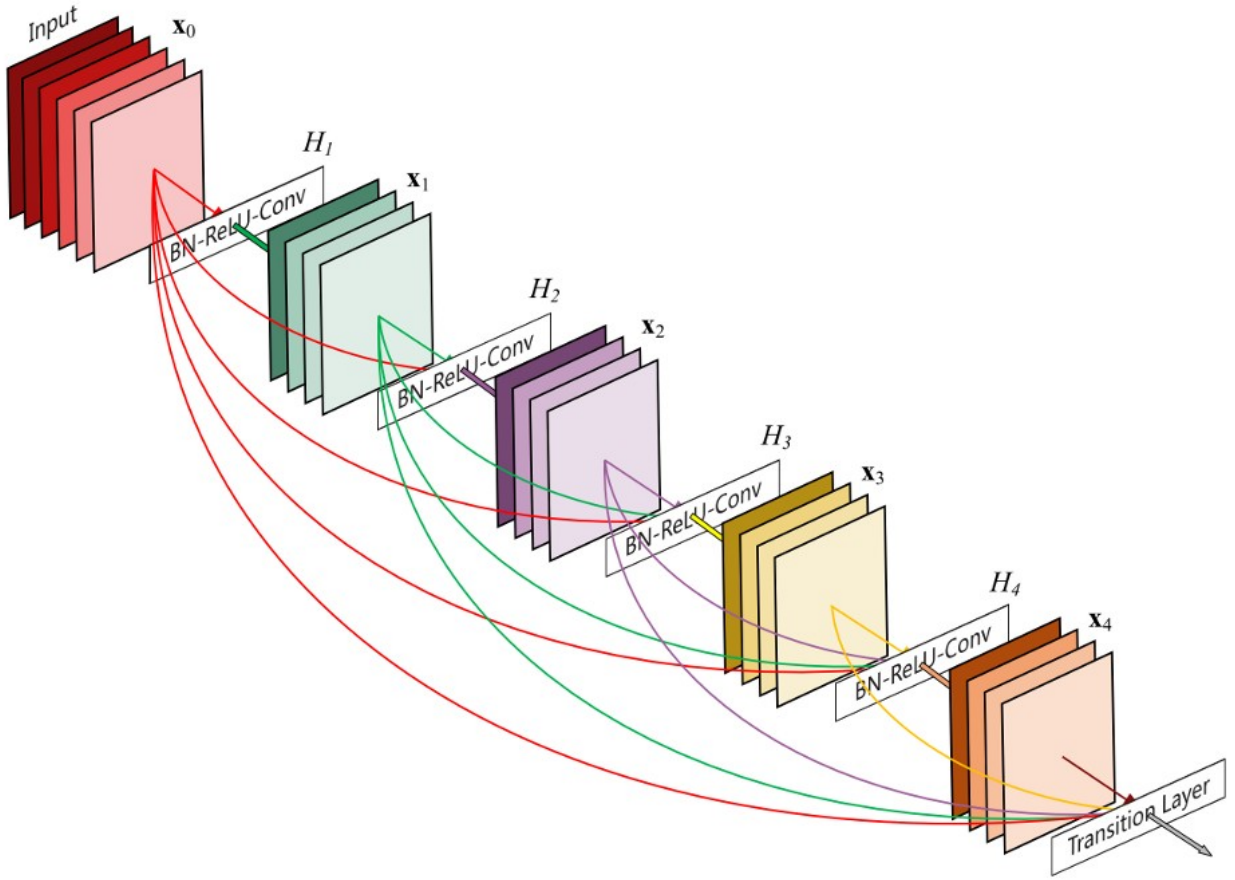


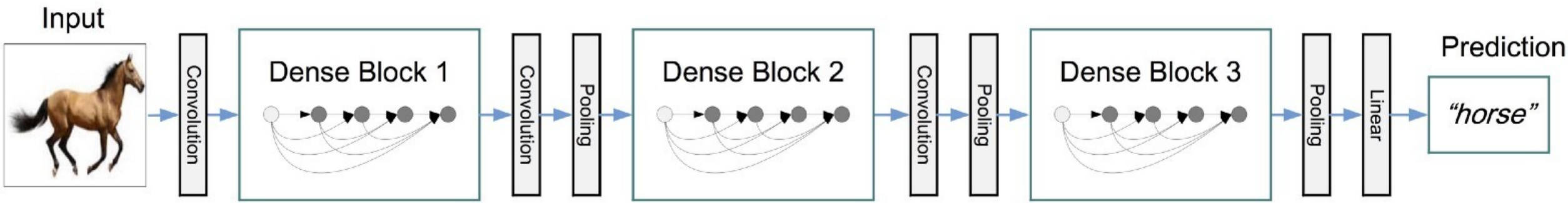


Доступные сети

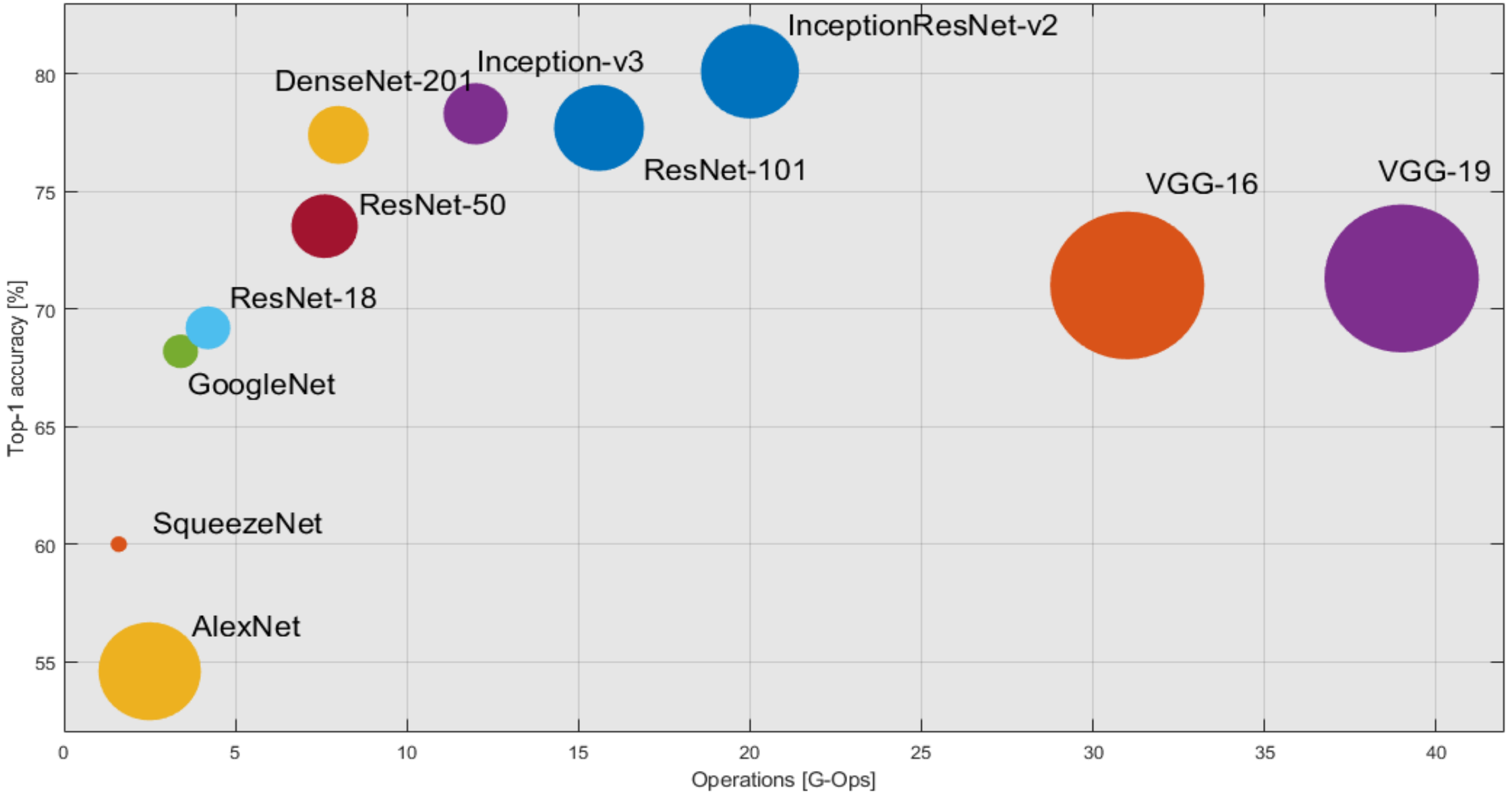


DenseNet

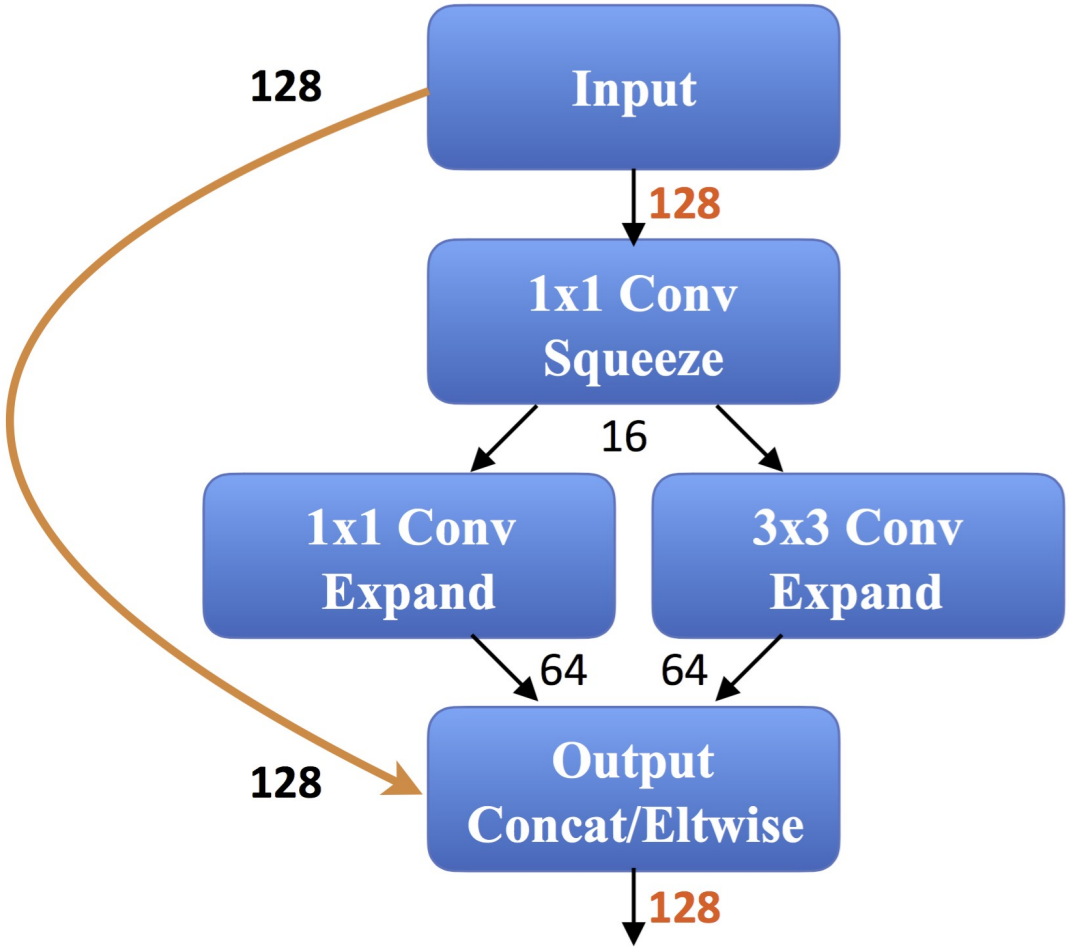

Input
$\mathbf{x}_0$
H_1
$\mathbf{x}_1$
BN-ReLU-Conv
H_2
$\mathbf{x}_2$
BN-ReLU-Conv
H_3
$\mathbf{x}_3$
BN-ReLU-Conv
H_4
$\mathbf{x}_4$
BN-ReLU-Conv
Transition Layer

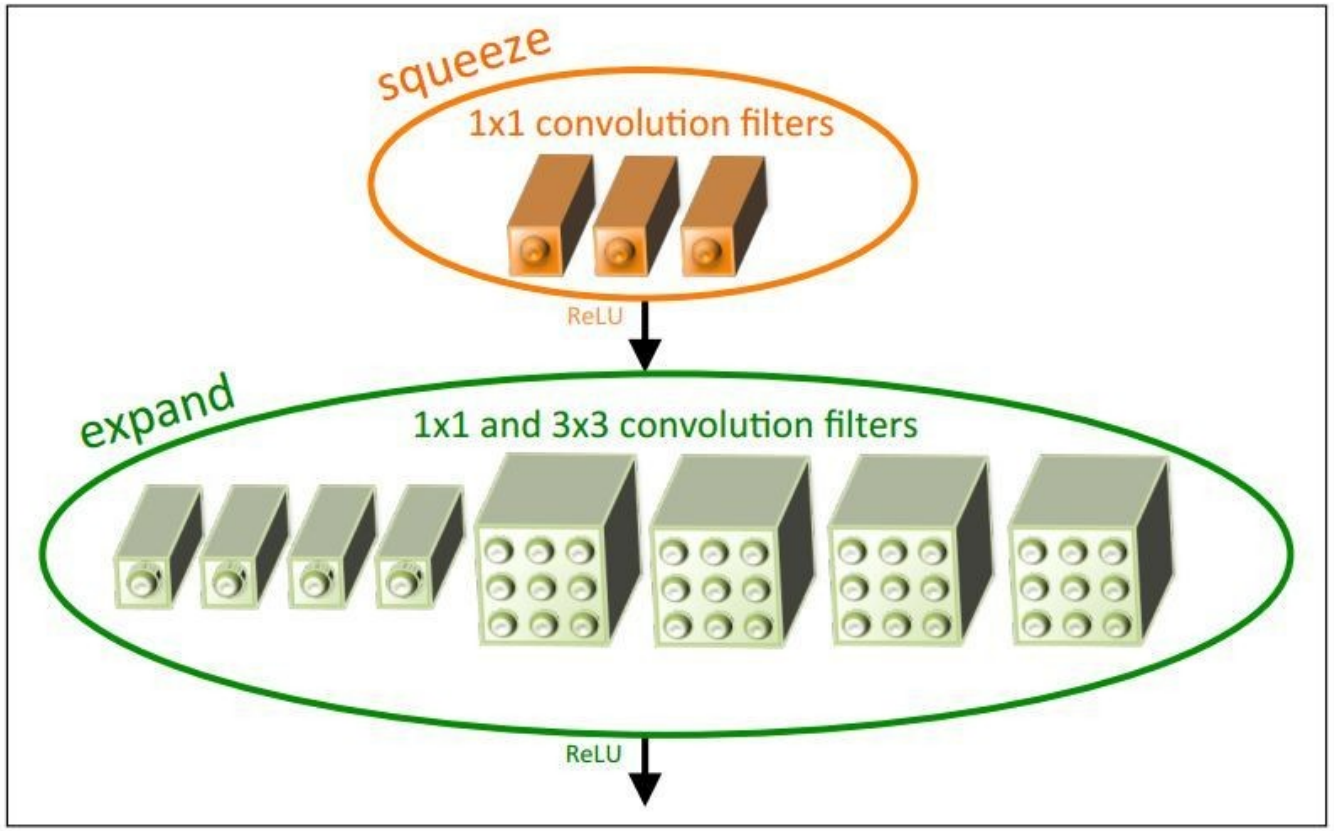
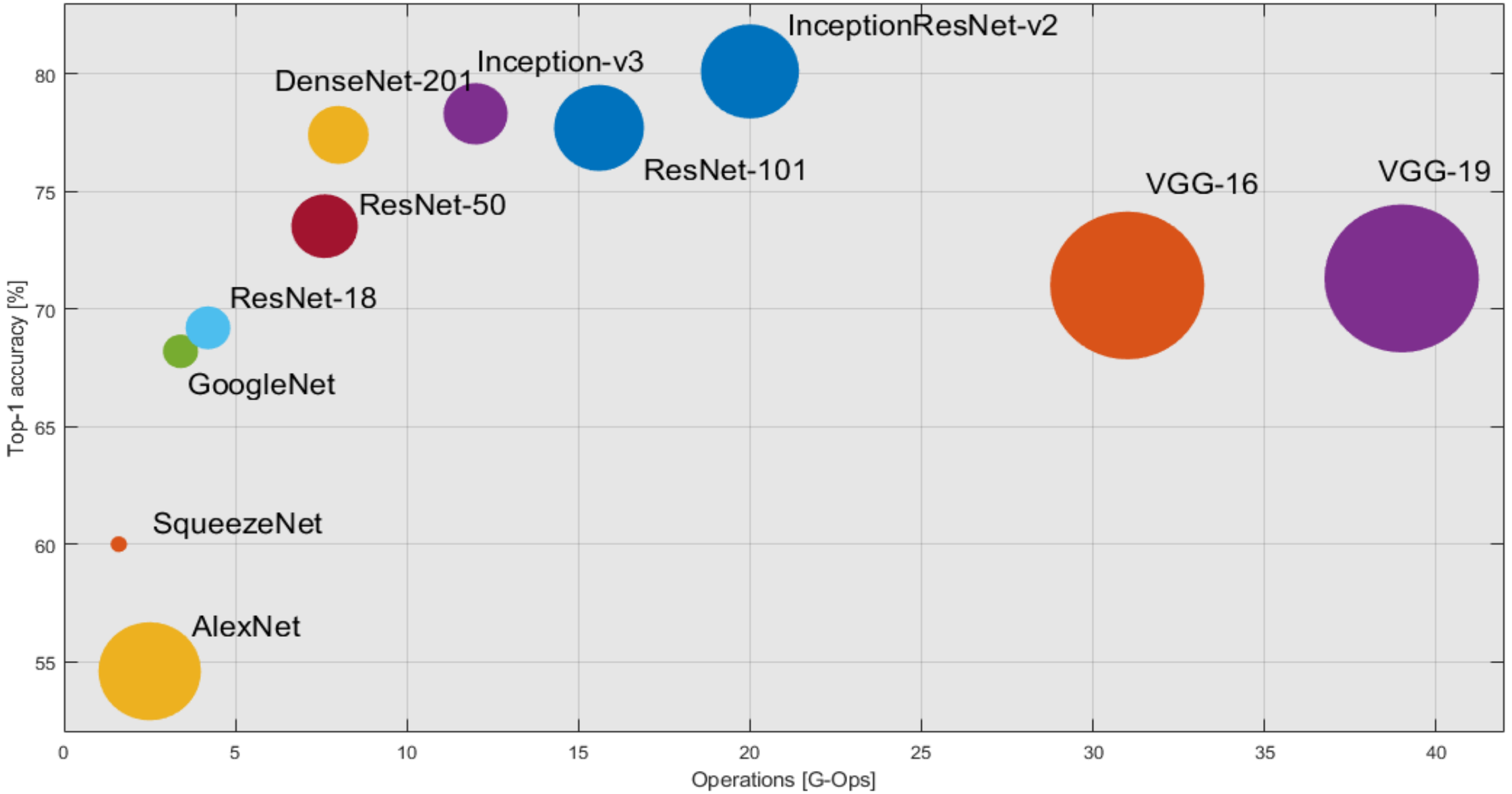

Input
Convolution
Dense Block 1
Convolution
Pooling
Dense Block 2
Convolution
Pooling
Dense Block 3
Pooling
Linear
Prediction
"horse"

Доступные сети



SqueezeNet


128
Input
128
1x1 Conv
Squeeze
16
1x1 Conv
Expand
3x3 Conv
Expand
64
64
128
Output
Concat/Eltwise
128


squeeze
1x1 convolution filters
ReLU
expand
1x1 and 3x3 convolution filters
ReLU

Доступные сети