image recognition and swift
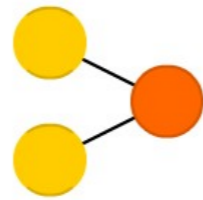
brettkoonce.com/talks

february 23rd, 2019

overview

- neural networks + convolutions

- vgg, resnet, mobilenets

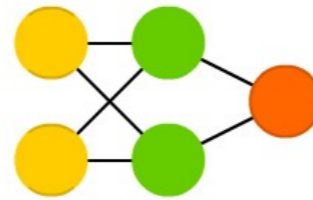- imagenet, transfer learning, coreml

- xcode playground, turicreate

neural networks

Input Cell
Hidden Cell
Output Cell
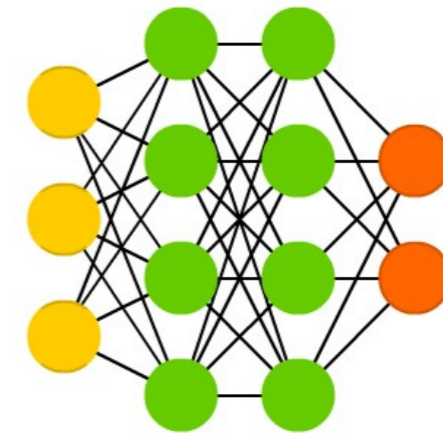Kernel
Convolution or Pool

Perceptron (P)

Feed Forward (FF)
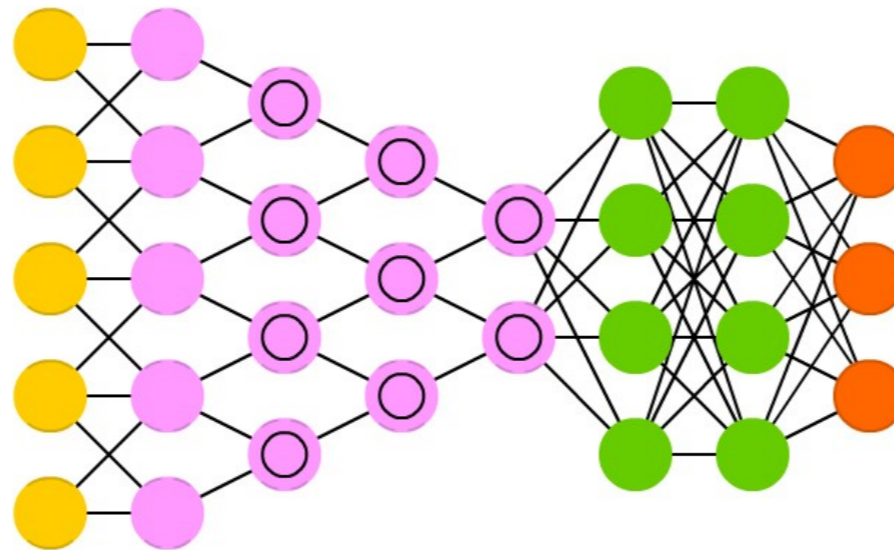
Deep Feed Forward (DFF)

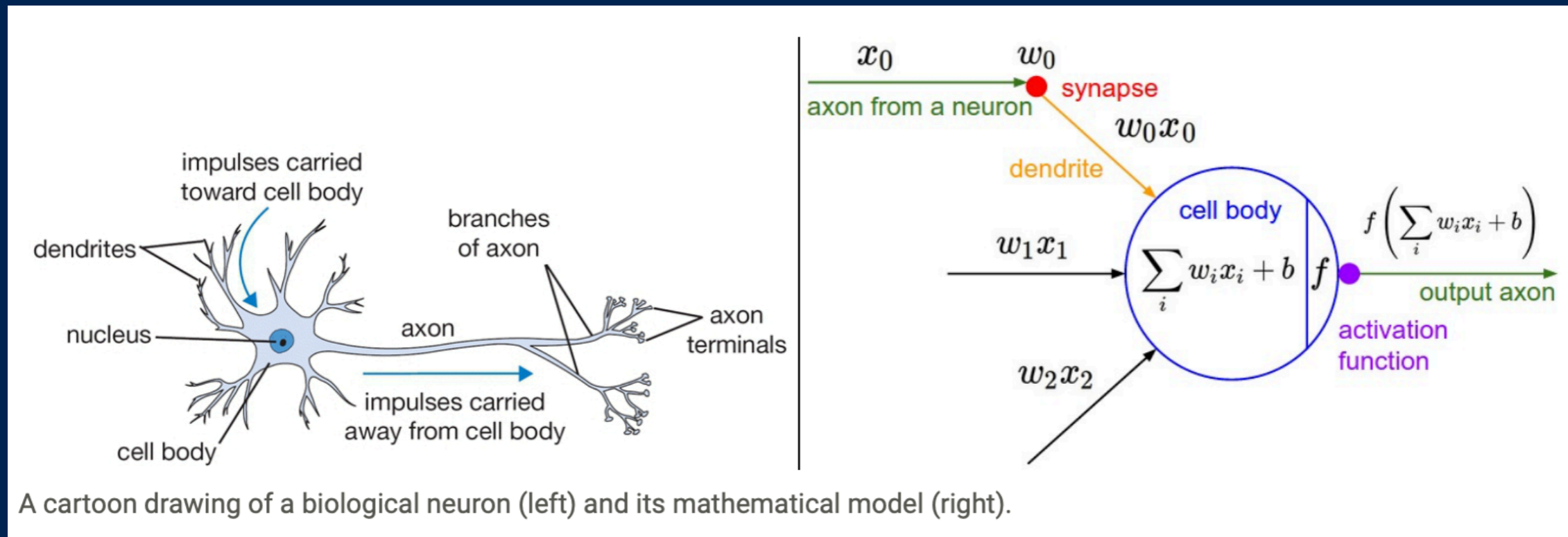Deep Convolutional Network (DCN)

synapse/neuron

A cartoon drawing of a biological neuron (left) and its mathematical model (right).

- **cs231n.github.io**

convolutions

- [LxM] —> [MxN]

striding

Stride = 1

maxpool

Single depth slice

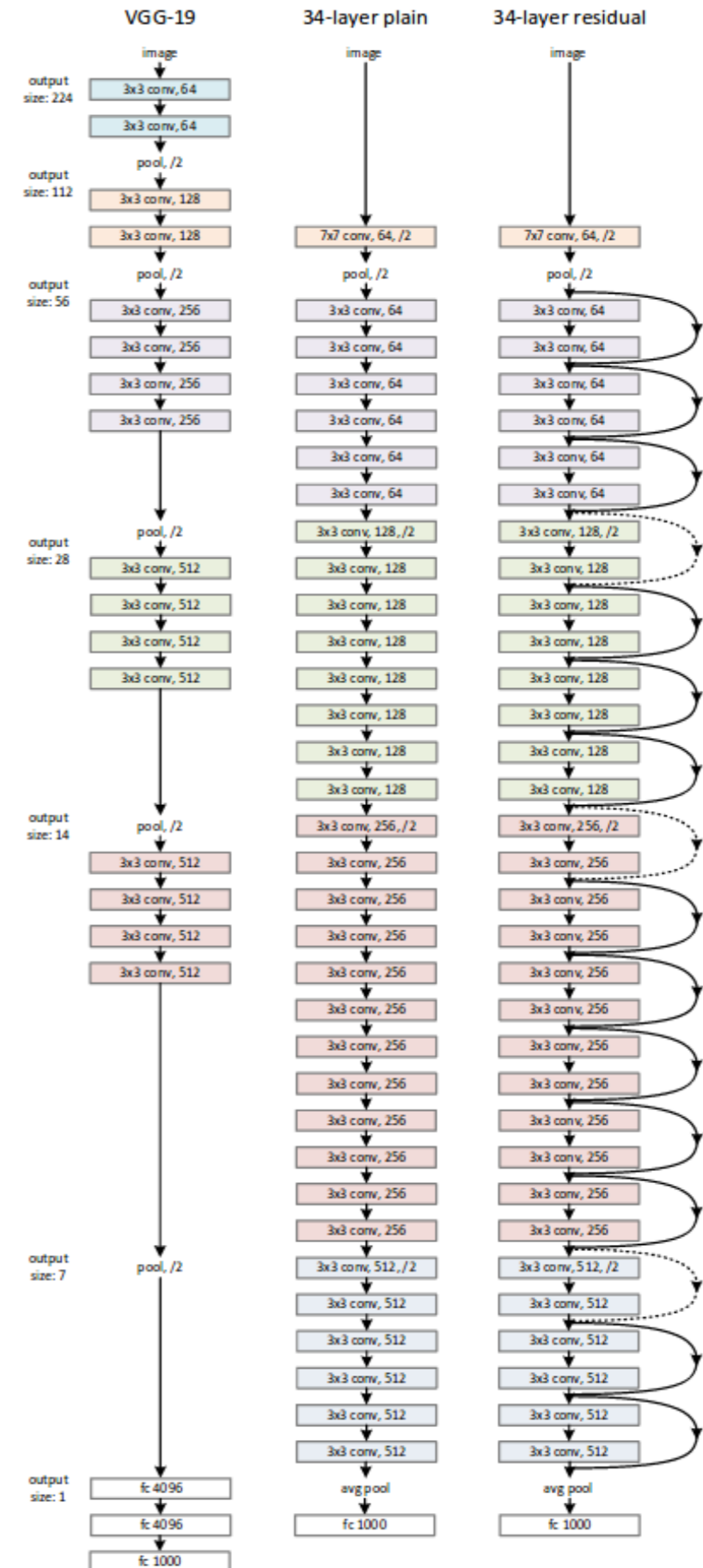max pool with 2x2 filters and stride 2
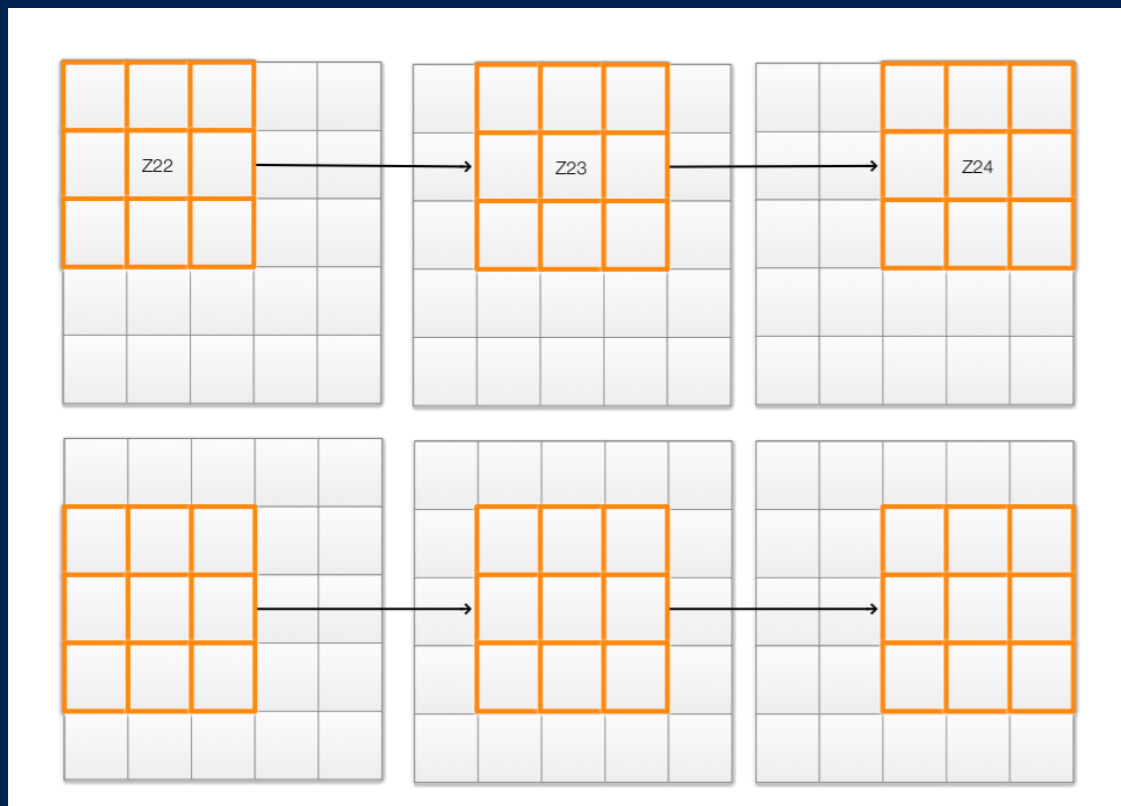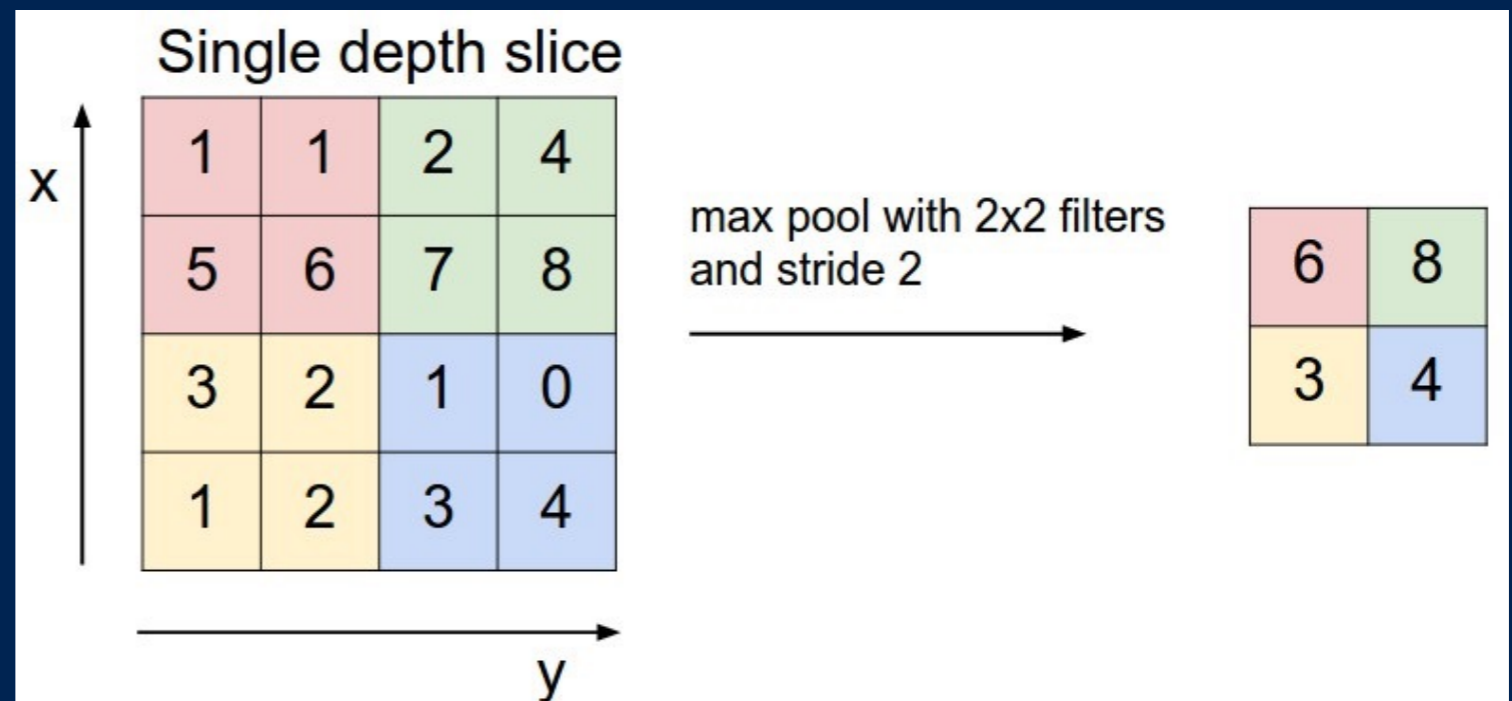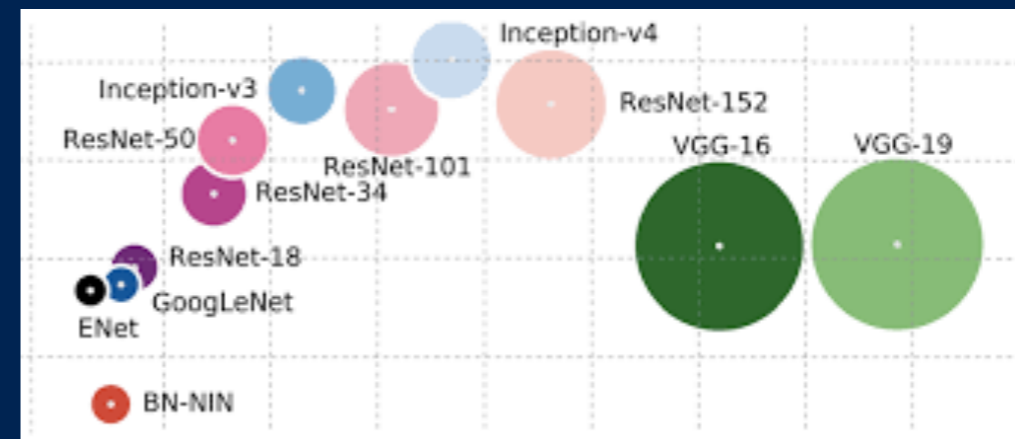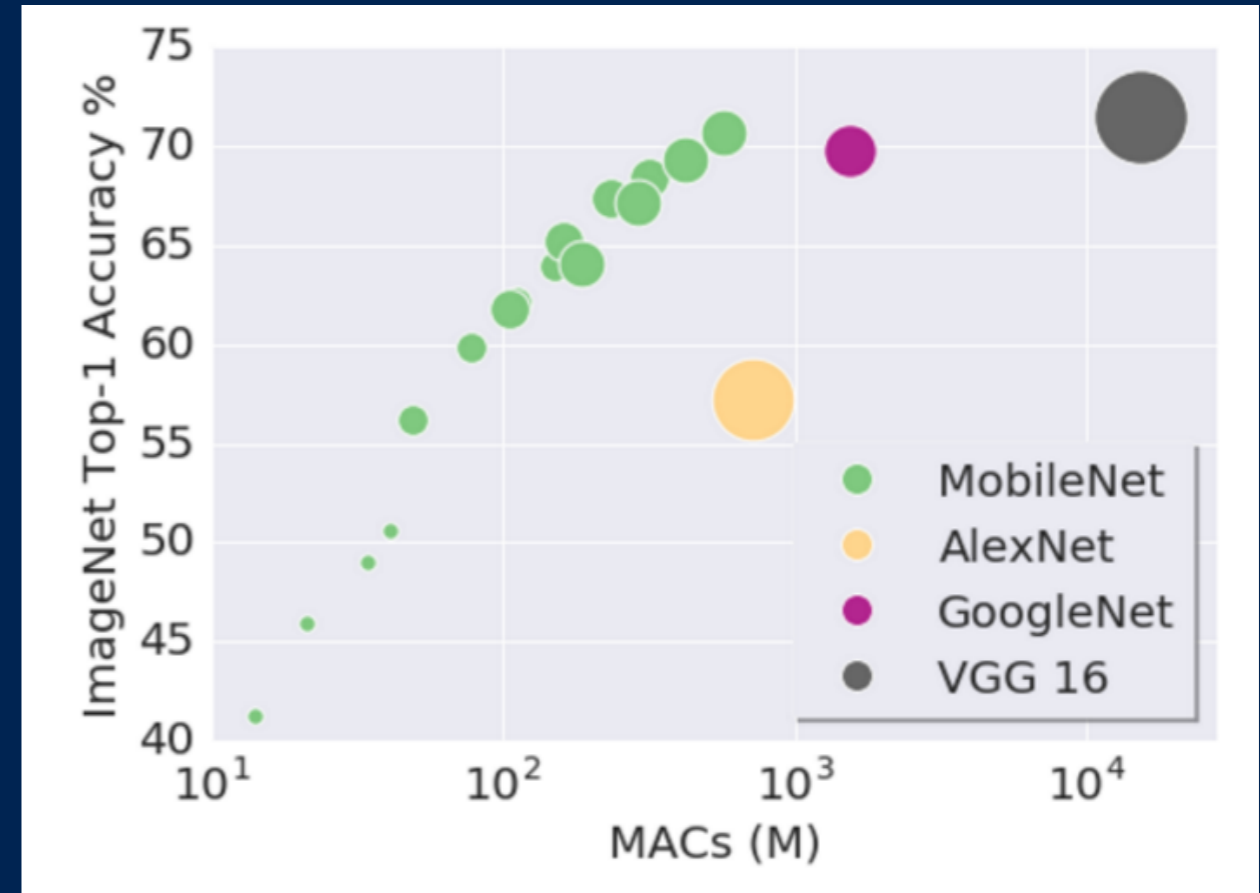
vggnet
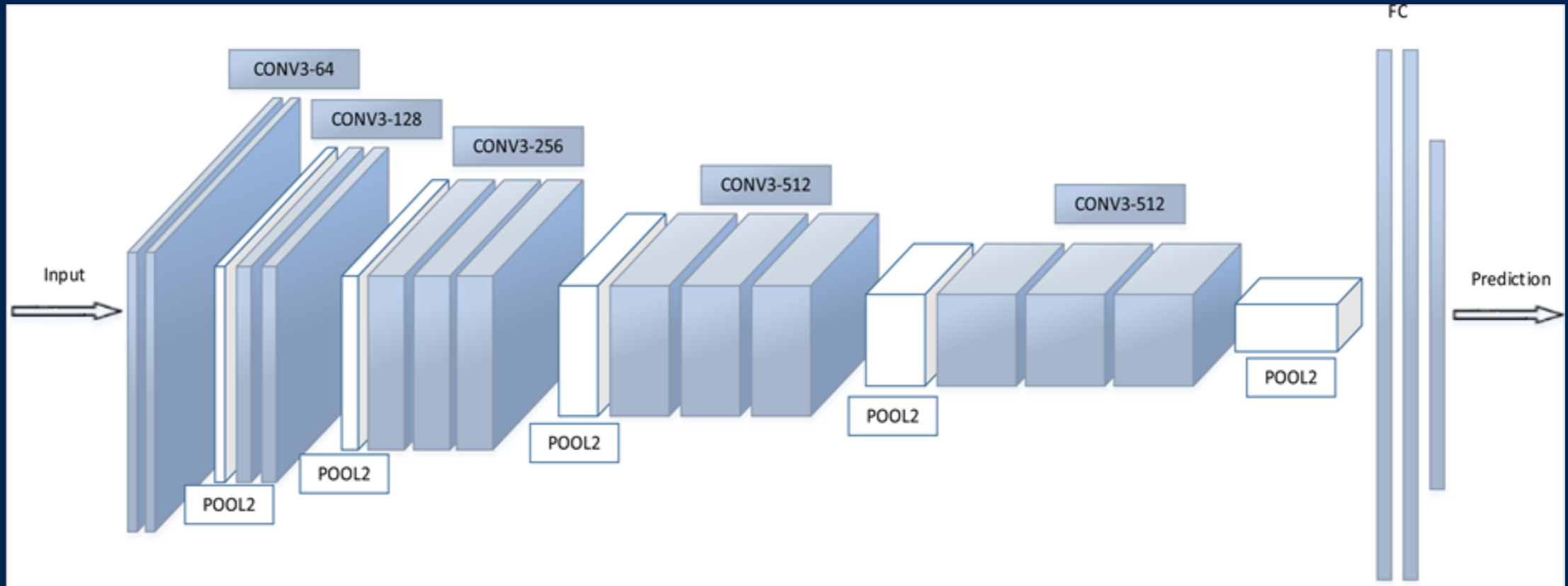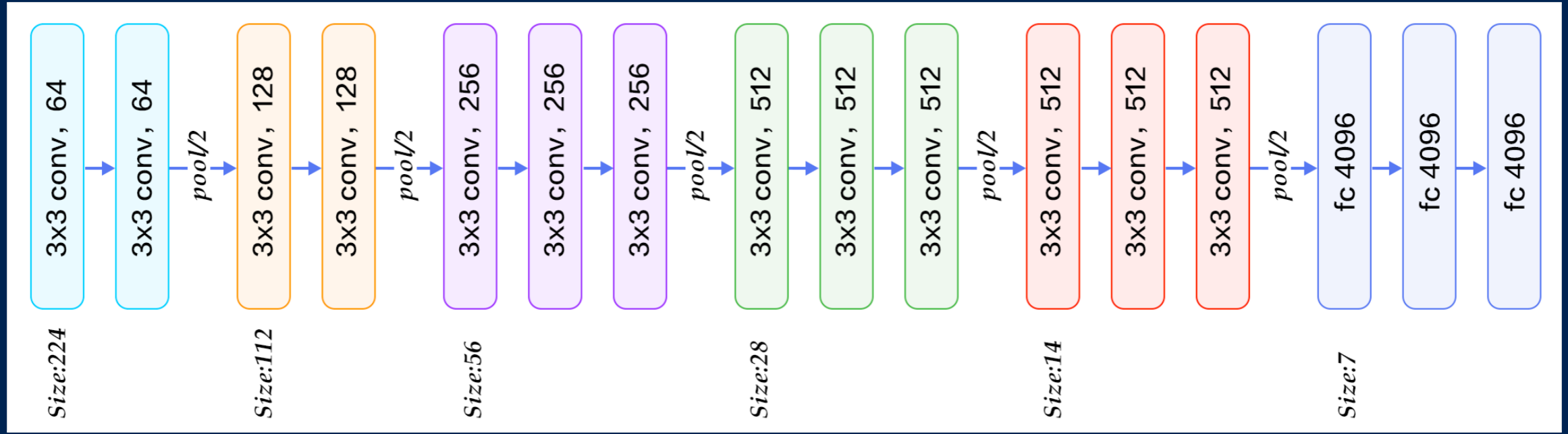
resnet

- **residual networks**

- **skip connections**

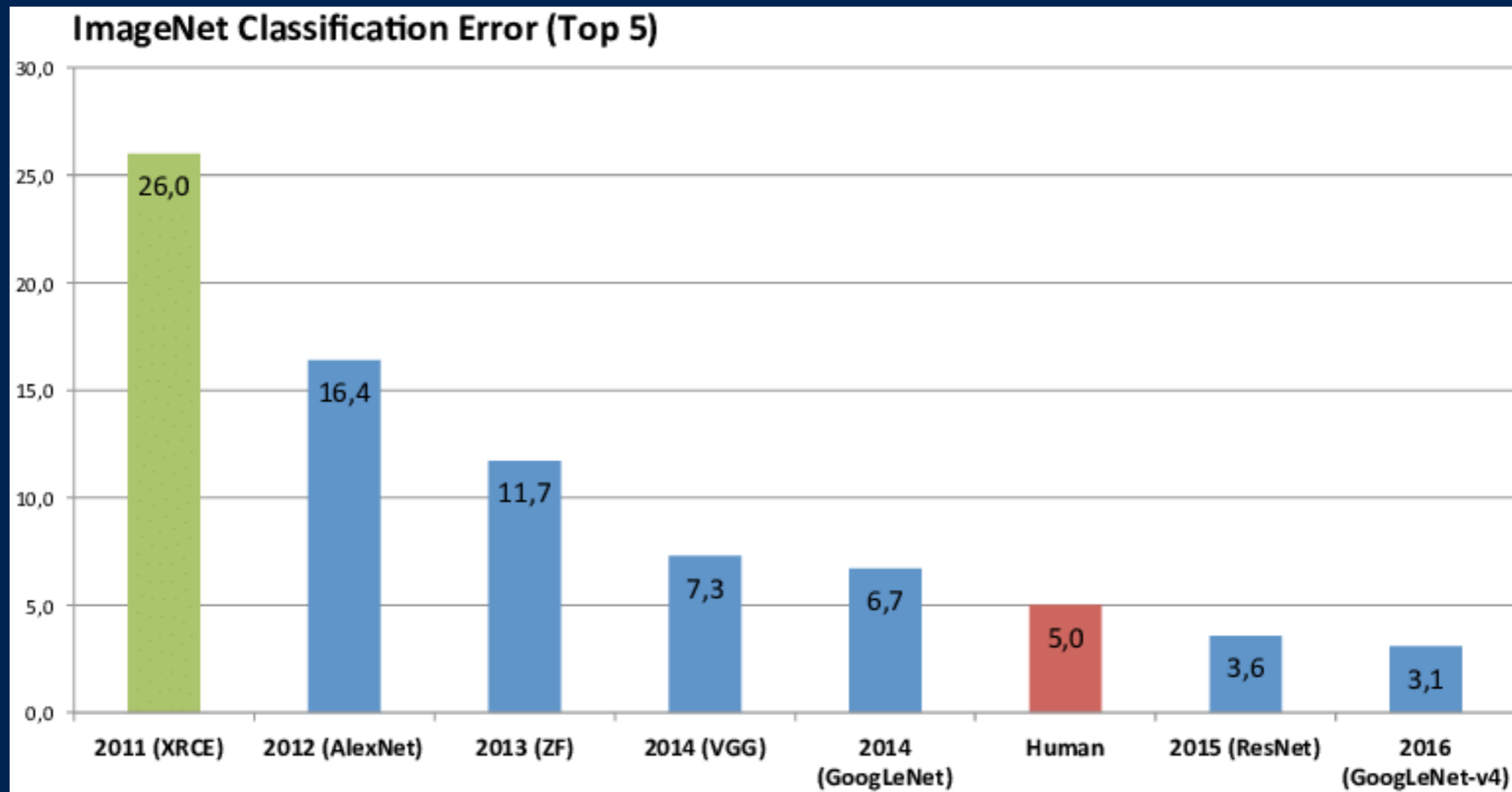- **even deeper training**

- **turicreate resnet demo**

mobilenets

- **depthwise separable convolutions**

- **v1: april 17**

- **v2: february 18**
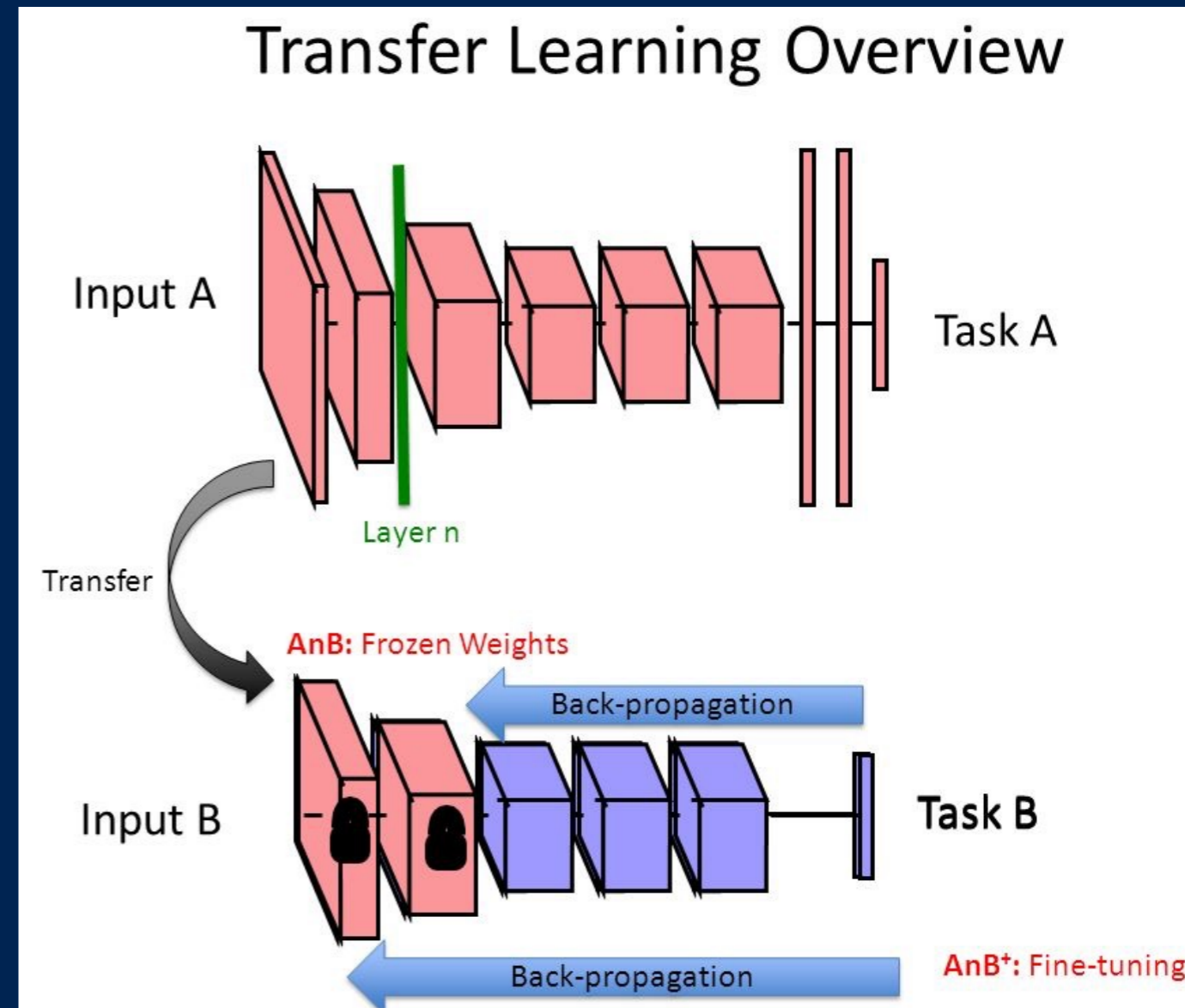
imagenet

- 1.2M pictures, 1000 categories

model retraining

- let's not rebuild our model from scratch!

- can reuse existing model

- re-run training on part of model with new data set

xcode playground

- drag and drop gui for your pictures

- takes mobilenets model, applies transfer learning to retrain to new data

- export as coreml to run on device

turicreate

- same idea as Xcode playground

- command line version

- can be scripted with python