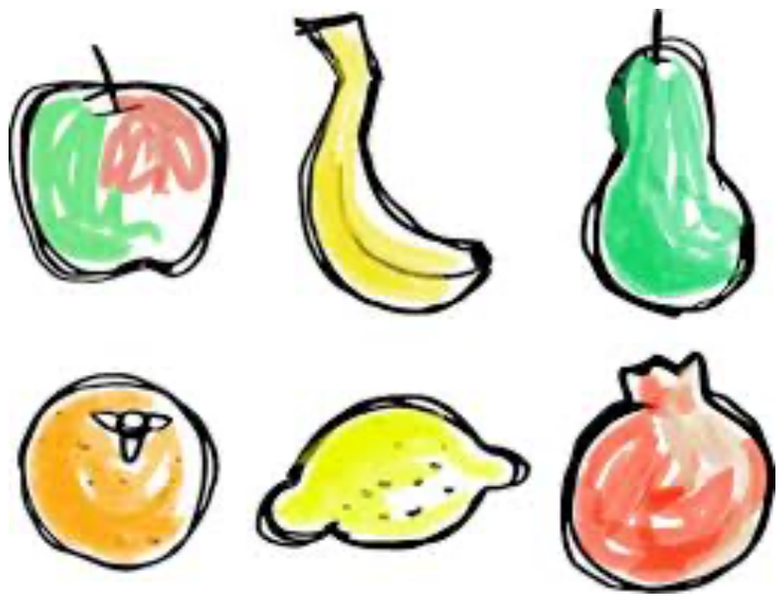
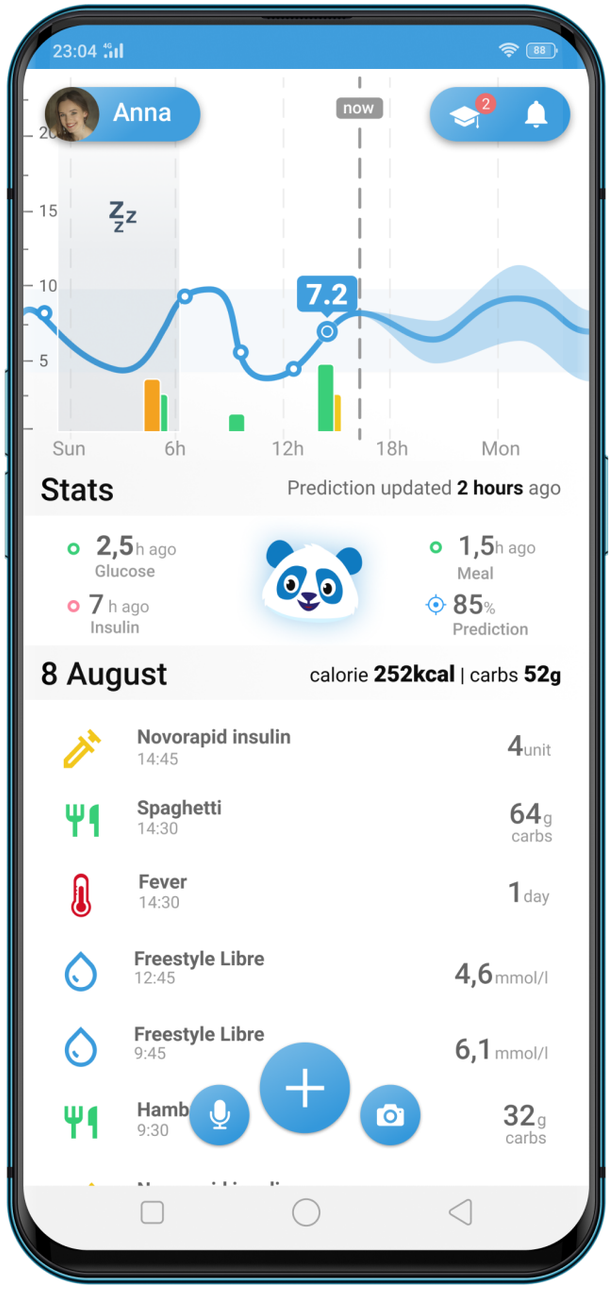


Food recognition

Rezső Oberfrank, DiabTrend

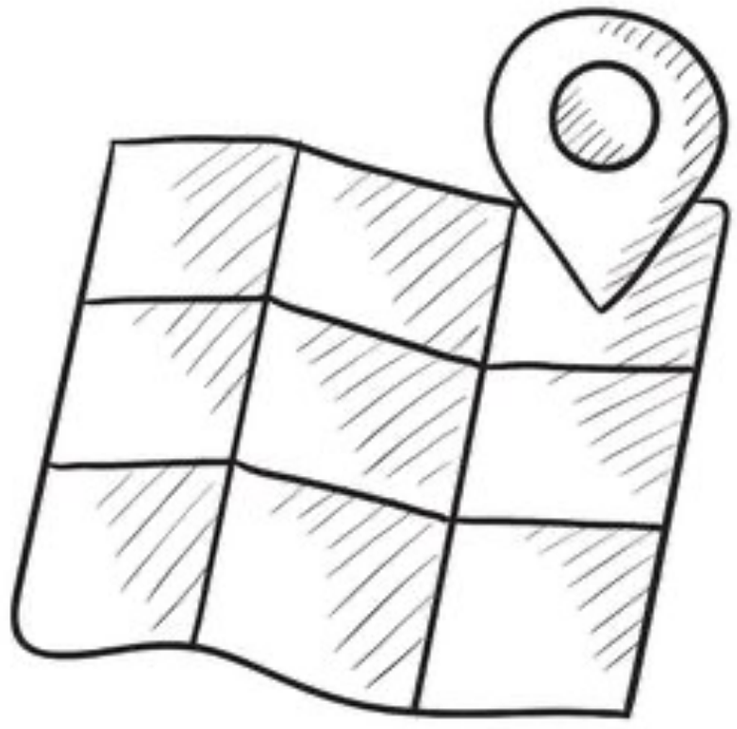
DiabTrend

- Blood glucose level prediction
- Diabetes diary
- Glucose level, insulin intake
- Sleeping time, physical activity
- Food intake
- Illness, etc…



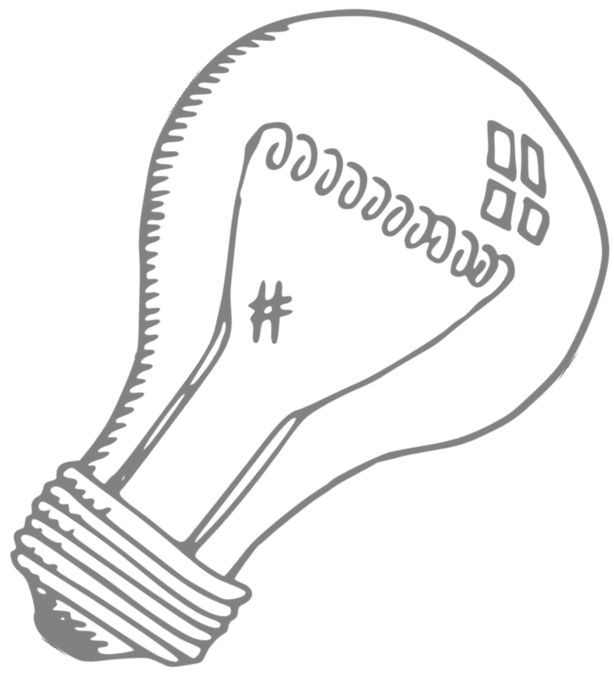
Overview

- ~~Who are we?~~ ✓
- Our problem
- Image classification
  - Data & augmentation
  - CNN architectures
- example.ipynb



The problem

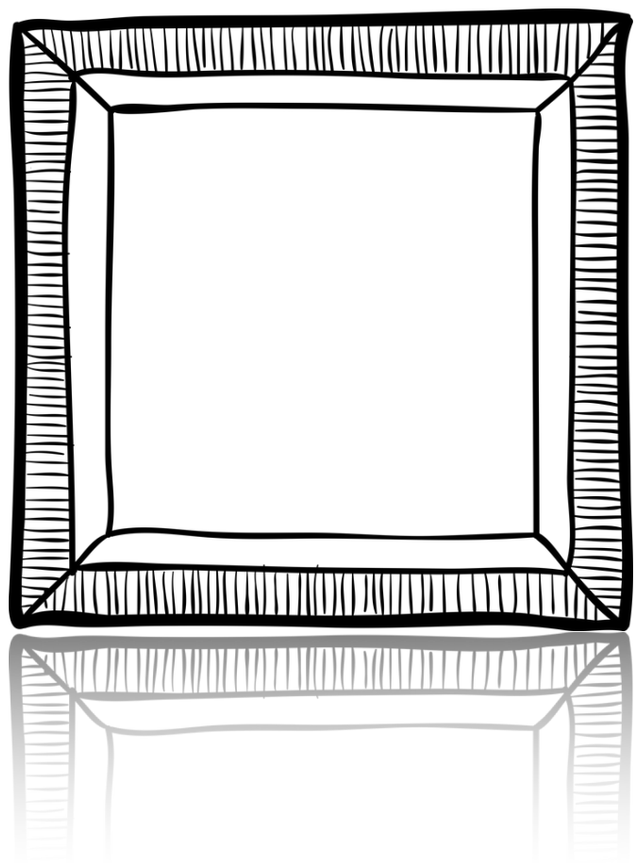
- Users time is precious
  - **Bluetooth:** Blood glucose meters & Insulin pens
  - **Apple Health/Google Fit:** Activity, Sleep and Pulse
- Food input is text based -> SLOW
- **Solution:** Image classification
- **Challenge:** Mobile hardware



Data & Augmentation

Real Data: images collected 1000+ foods in app

Example data: Cats and Dogs *(open-source)*

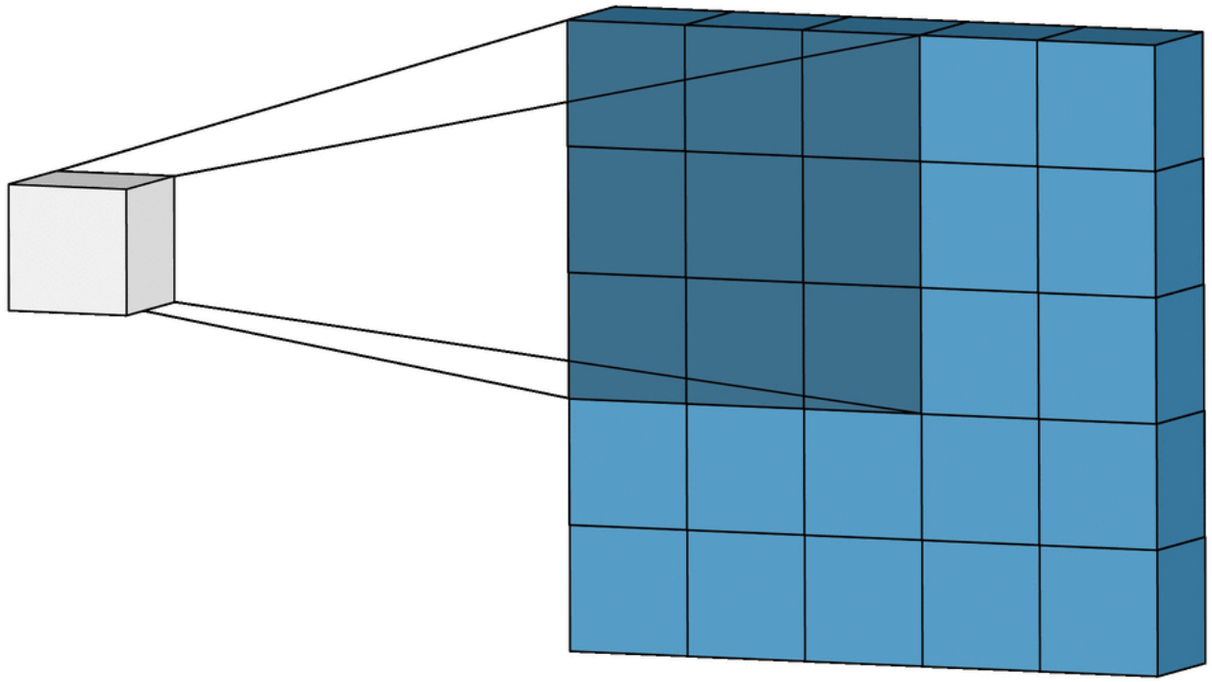


Augmentation types

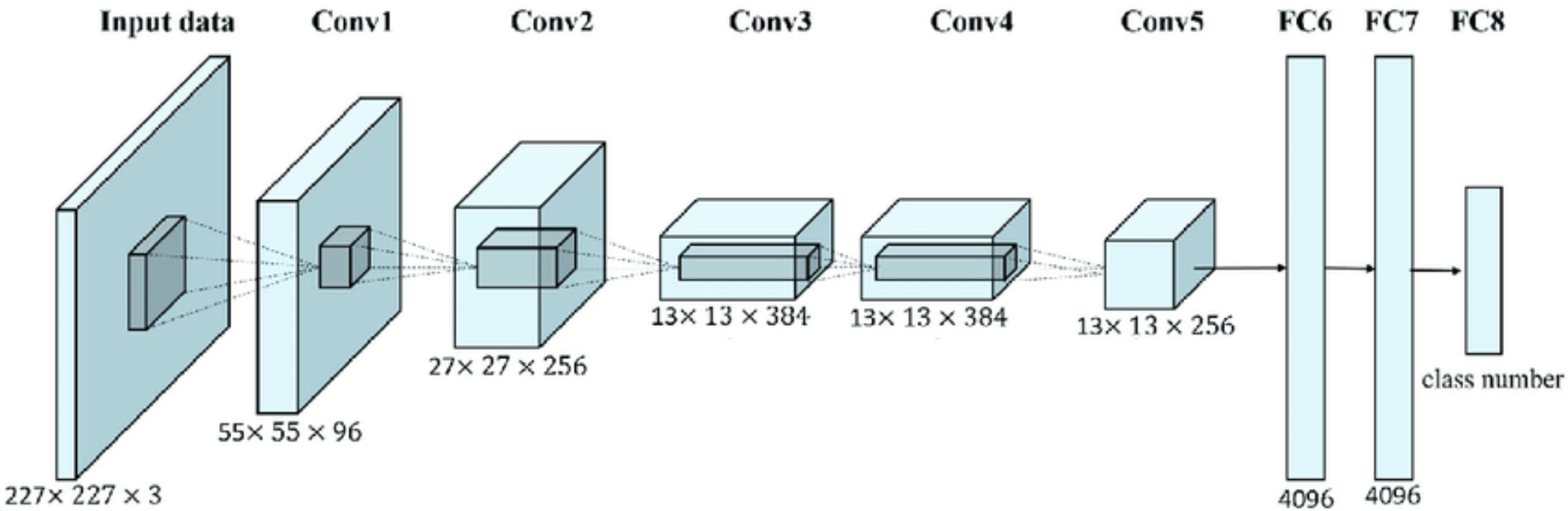
- **Transform:** flip, crop, translate, rotate,…
- **Colour:** brightness, contrast, hue,…
- **Obfuscate:** noise, blur, partial cover,…

CNN architectures

- AlexNet (2012)
- VGGNet (2014)
- Inception (2014)
- ResNet (2015)
- InceptionV4 (2016
- MobileNet (2017)

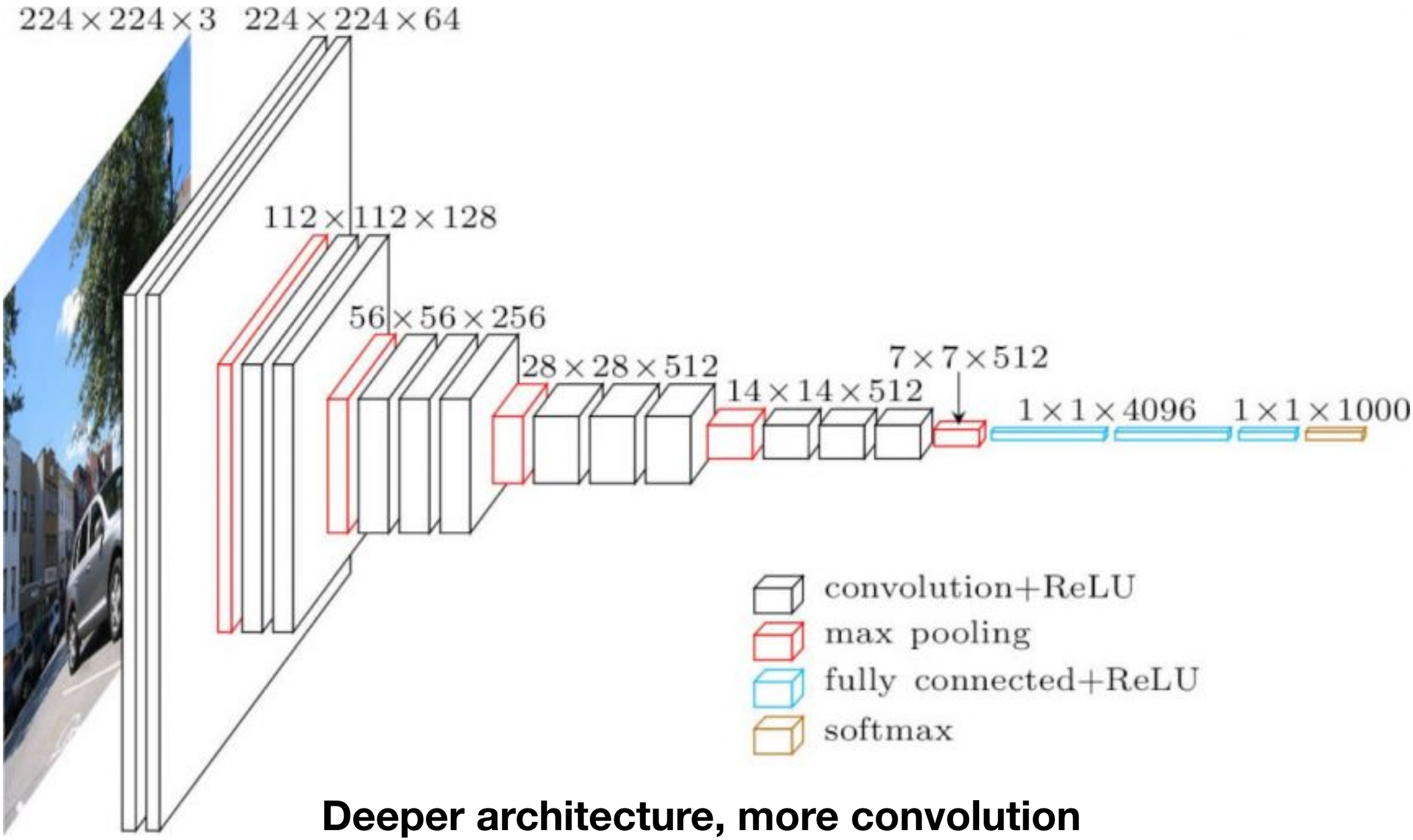


AlexNet (2012)



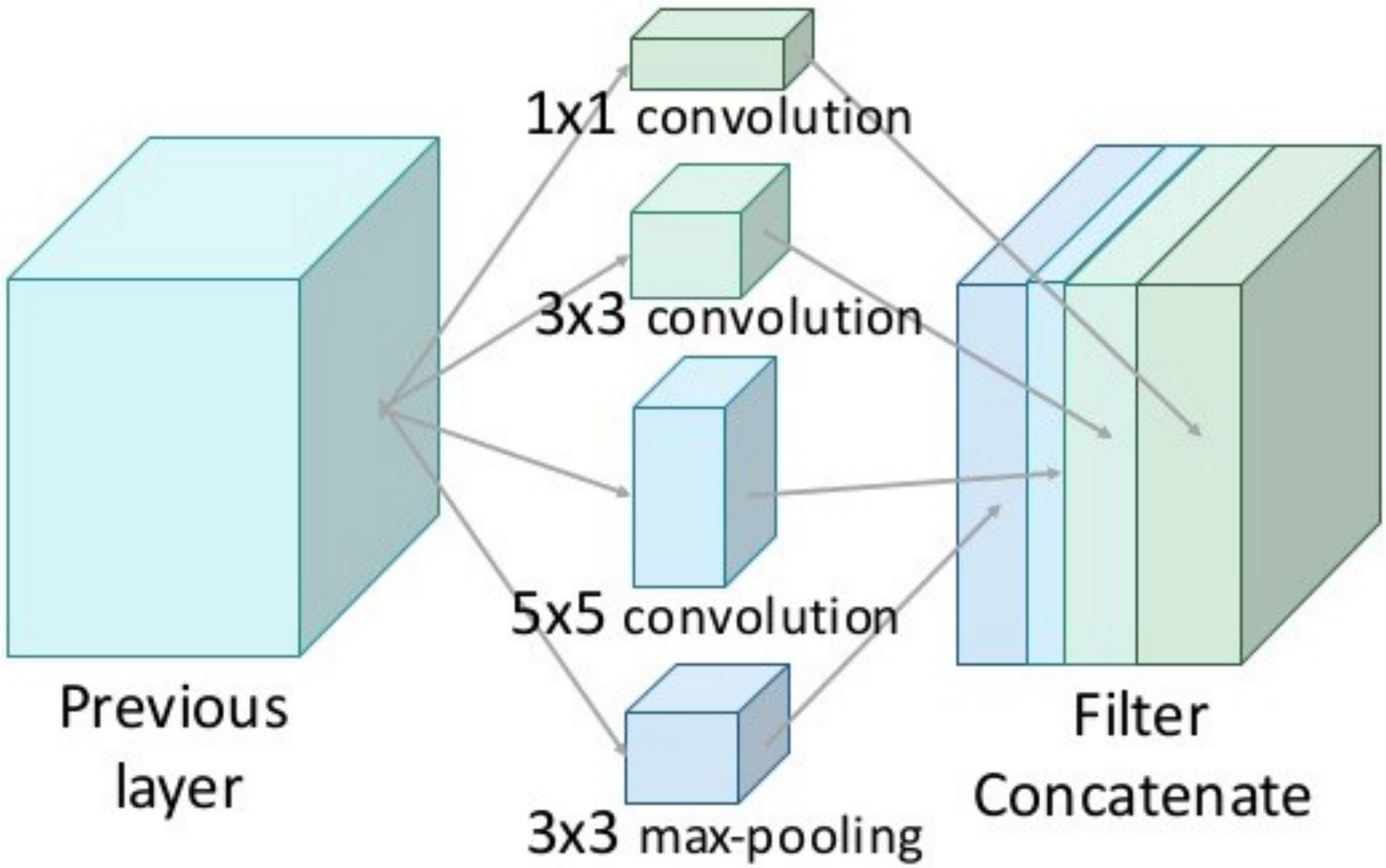
Original breakthrough

VGGNet (2014)



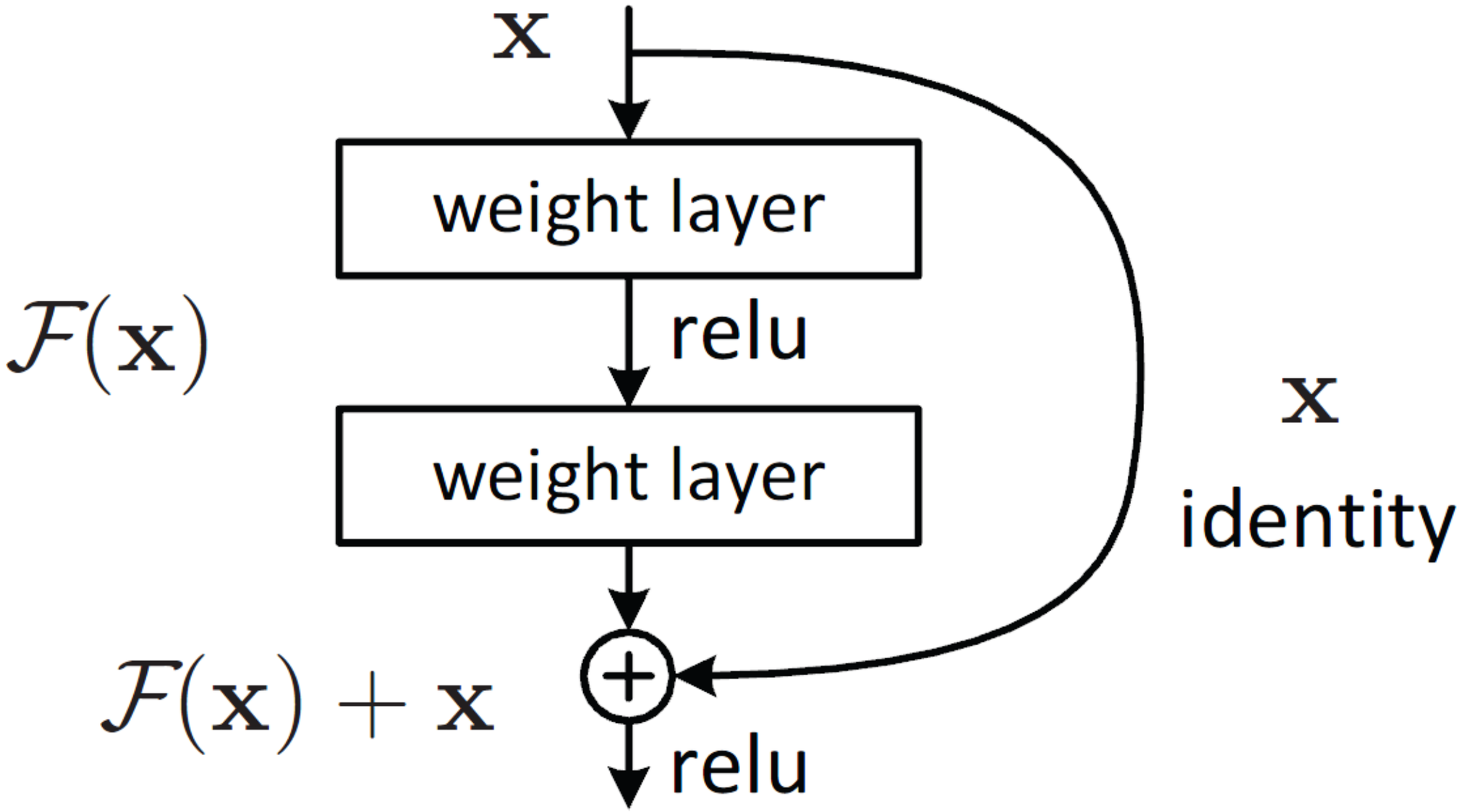
Deeper architecture, more convolution

Inception (2014)



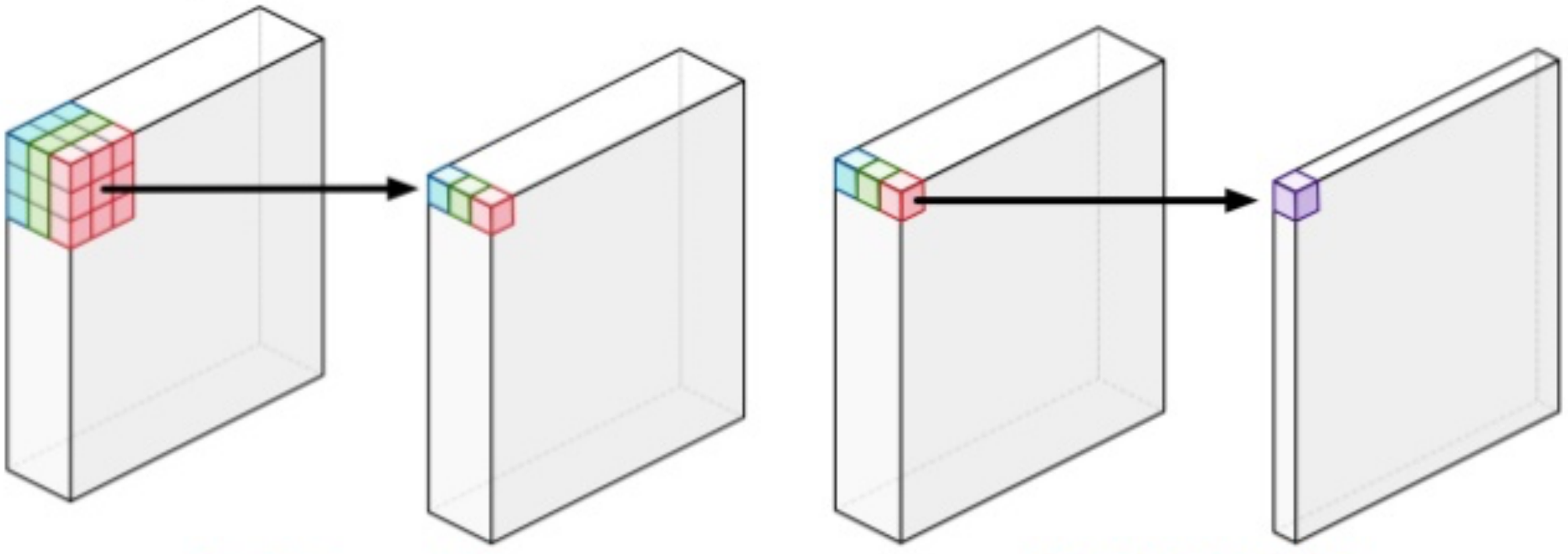
Parallel operations, wider architecture

ResNet (2015)



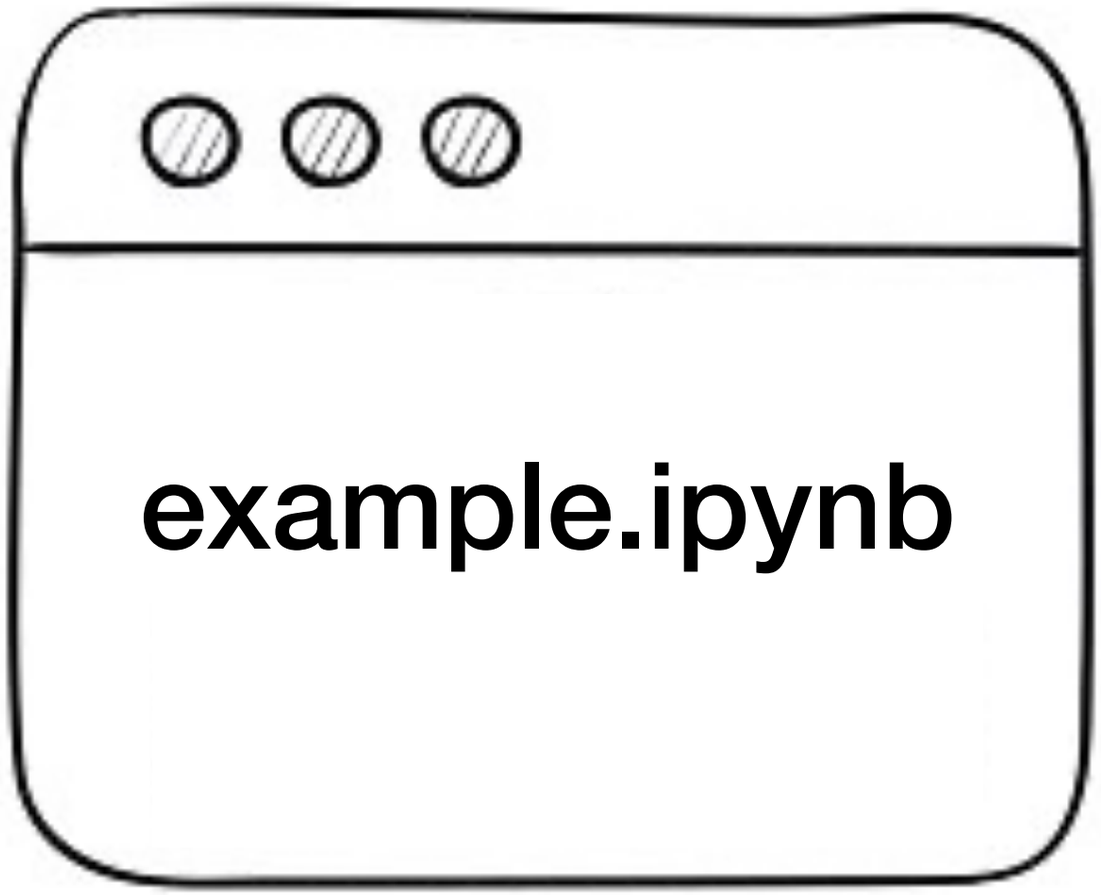
Solves disappearing gradient, deeper architecture

MobileNet (2017)



Figures from http://machinethink.net/blog/googles-mobile-net-architecture-on-iphone/

Computationally cheaper, but worse performance


example.ipynb

Takeaways

- Collect lots of images
- Experiment with augmentation
- Try different networks

Thank you for your attention!

DiabTrend

rezso.dev