

# Agenda

1) Resnet

Theory

Practicals

CV

Training

Testing

FASTAPI

Image Class  
App

AWS ✓

Azure ✓

GCP ✓

$\frac{1}{2} \rightarrow$  Channel Reduction  
operation  
 $(1 \times 1)$

Max P

$\frac{1}{2} \rightarrow$   
entry to  
next block  
apply reduction

$\frac{h \ w}{(MP)}$

$\frac{2}{(1 \times 1)}$

$$\begin{array}{r}
 1 \times 1 \\
 \hline
 32, 64 \\
 128 \\
 512 \\
 1024 \\
 2048 \\
 \hline
 \text{decrease} \\
 70\%
 \end{array}$$

$$\begin{array}{r}
 1 \times 1 \\
 \hline
 1024 \\
 7 \times 7
 \end{array}$$

$$\begin{array}{r}
 1024 \\
 \hline
 30\%
 \end{array}$$

$$\begin{array}{r}
 1024 \\
 \hline
 70\%
 \end{array}$$

Info loss = 1%

Increase = 0.01%

Manipulation of

Input	Output
-------	--------

$$\begin{array}{c}
 (1 \times 1) \rightarrow \text{most} \\
 \rightarrow \text{in} \\
 \rightarrow \text{de}
 \end{array}$$

$$\begin{array}{r}
 774 \\
 \hline
 \rightarrow 3 \text{ on } 3 \times 3
 \end{array}$$

$$\begin{array}{r}
 \text{P.L} \\
 \hline
 1 \times 1, 64 \\
 512
 \end{array}$$

Conv3

$$\begin{array}{l}
 1 \times 1 \\
 \text{Input: } 32 \\
 \text{Conv } 3 \times 3, 32 \\
 = 30 \times 30 \times 32 \\
 = (1 \times 1) \times 1024
 \end{array}$$

$$= \sqrt{30 \times 30 \times 1024}$$

Input  $\rightarrow$  higher channels

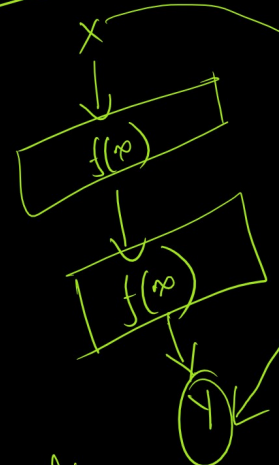
$$34 \times 34 \times 128$$

$$1 \times 1 \quad 64$$

$$34 \times 34 \times 64$$

$$32 \times 32 \times \underline{\underline{128}}$$

$$\frac{\frac{D}{C}}{\frac{I}{x}}$$



Addition

Input

$$f(x) =$$

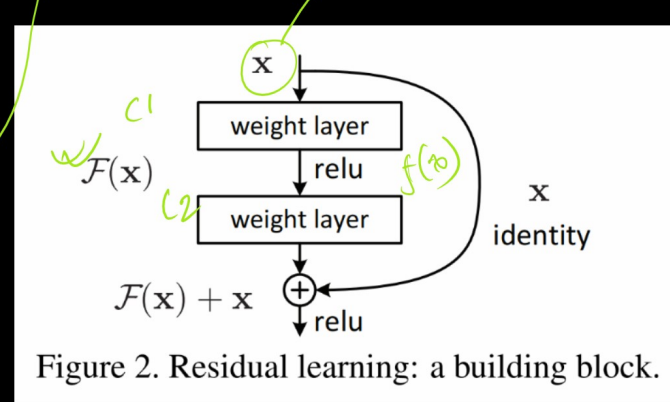
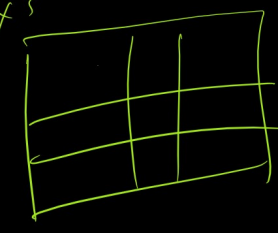


Figure 2. Residual learning: a building block.

Input

$$3 \times 3$$



$$= 0.0000078 + \underline{\underline{0.07}}$$

$$W =$$

$$W =$$

$$= \text{pred}_1 + \text{skip connected pred}_2$$

output

Before conv(3,3)

1st Decrease

2nd Increase

$48 \times 48 \times 256$

$1 \times 1 \times 64$

$48 \times 48 \times 64$

$(m \times n \times d)$

Parameters