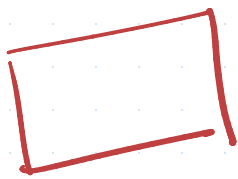


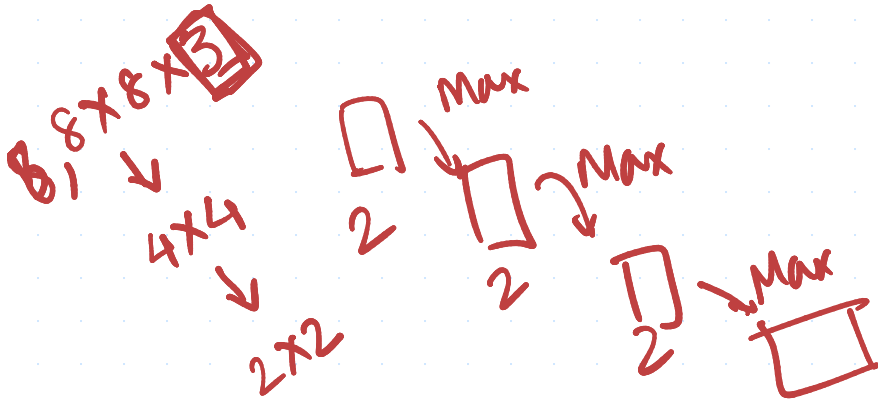
$$v = \begin{pmatrix} 1 \\ 2 \\ 3 \end{pmatrix} \quad v v^T$$

$$v^T v = (1 \ 2 \ 3) \begin{pmatrix} 1 \\ 2 \\ 3 \end{pmatrix} = 1 + 4 + 9 = 14$$

$$\frac{3 \times 1}{1 \times 3} \Rightarrow 3 \times 3$$



Input = (H, W, C)
 \downarrow maxpool.



\rightarrow 0-255
 \rightarrow Grayscale.
 \rightarrow $[:, :, :, -1]$

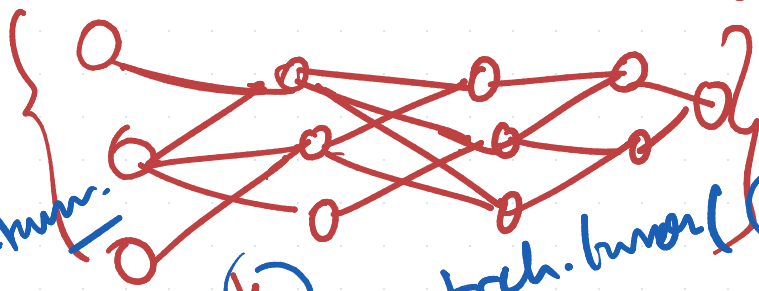
Open \rightarrow BGR
Matplotlib \rightarrow RGB.

Regression	x_2	House.	x_3	y_1 (\$)	y_2 (Million)
x_1					
# bedrm.	# bath	Lawn			
(2)	(1)	(0)	(50,000)	(1)	
(3)	2	1)	(80,000)	1)	
4	1	1)	(90,000)	1)	
1	2	0	(30,000)	0)	

tensor \rightarrow Gradient computation

\hookrightarrow GPU \rightarrow (=) \downarrow

o Automatic
Differentiation



(2) dtype = torch.float64

torch.tvm

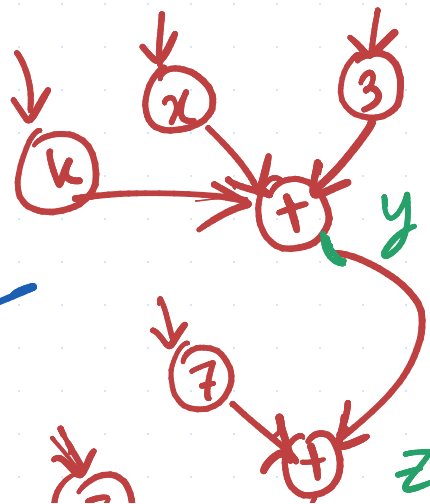
$$y = x + 3 + k$$

$$z = y + 7$$

$$a = z - 3$$

(3)

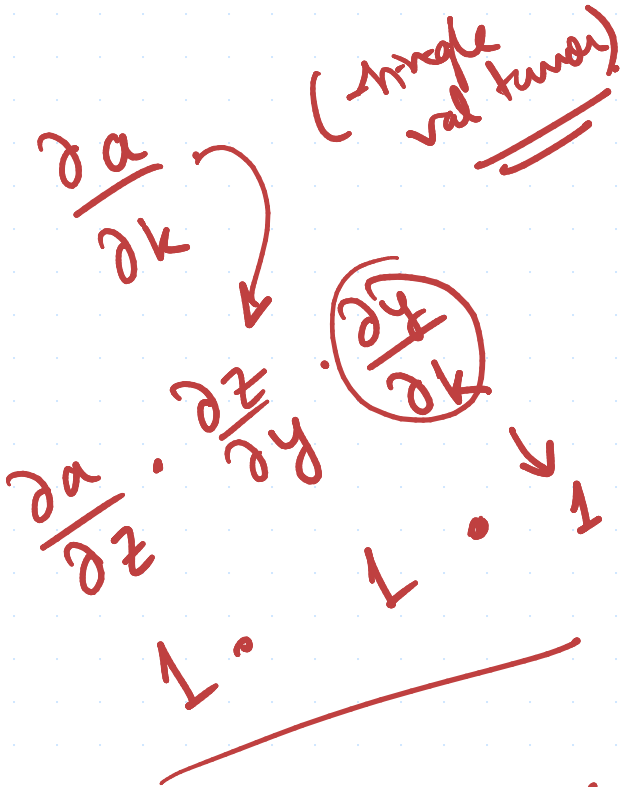
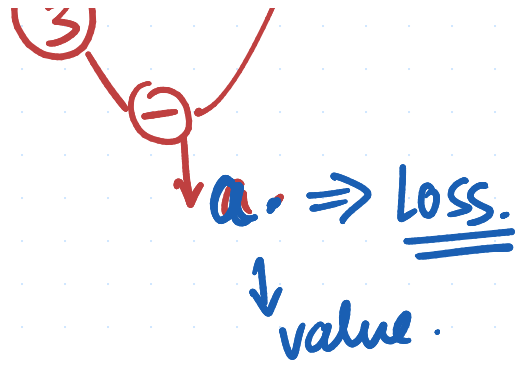
To all
DAG.



Computational
Graph.

z.grad

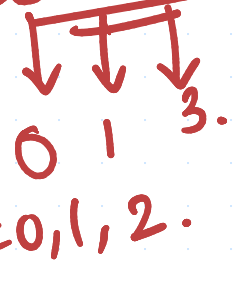
$\frac{\partial a}{\partial z}$ → easy



$y = x + 3 + k$
 $z = y + 7$
 $a = z - 3.$

①
 $k = \text{torch.tensor}(3)$

$k = \text{torch.tensor}([2, 3])$



$\frac{\partial a}{\partial k} = \frac{\partial a}{\partial z_i} \frac{\partial z_i}{\partial y_i} \frac{\partial y_i}{\partial k_i}$

Conferences :- (Venues)

Ivy \rightarrow League.

A* \rightarrow Top level.

(2-3) Master level.
(MIT \rightarrow PhD)

{ • NeurIPS. \rightarrow Neural N/w with theory
(IIT \rightarrow B \rightarrow 4) (Hard core) IF=23

• ICLR \rightarrow 48-87 (Hard core).
Intro. Conf. Learning Rep.

• CVPR \rightarrow 63 \rightarrow Impact factor.

• ICML \rightarrow 20.27. \rightarrow IF.

• ECCV \rightarrow 33 \rightarrow ⁸⁻ IF (unoff.).

• ICCV \rightarrow 8.34 \rightarrow IF

• JMLR \rightarrow 5.17 \rightarrow Journal of MLR.

• WACV \rightarrow 9

IIT \rightarrow

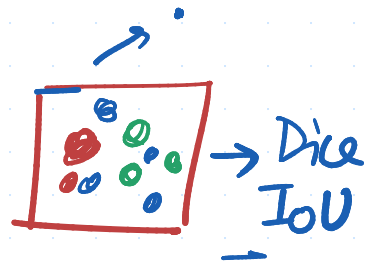
• Vin. B.
IIT H

• C.V. Jawah.

Research Sci \rightarrow Handbook.

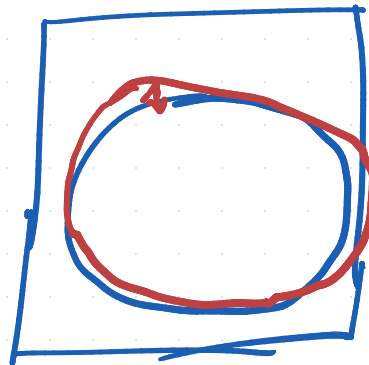
A

• MICCAI → (Medical)



B

ICIP →
ISBI →



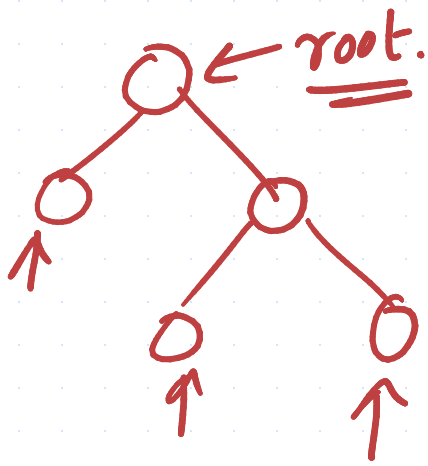
Hausdorff

ICASP...

$$y = 3x^2 + 15.$$

$$\frac{\partial y}{\partial x} = 6x.$$

$$\begin{aligned} \frac{\partial y}{\partial x} \Big|_{x=3} &= 6x \\ &= 6 \times 3 \\ &= \underline{18} \end{aligned}$$



Binary tree. } Algorithms