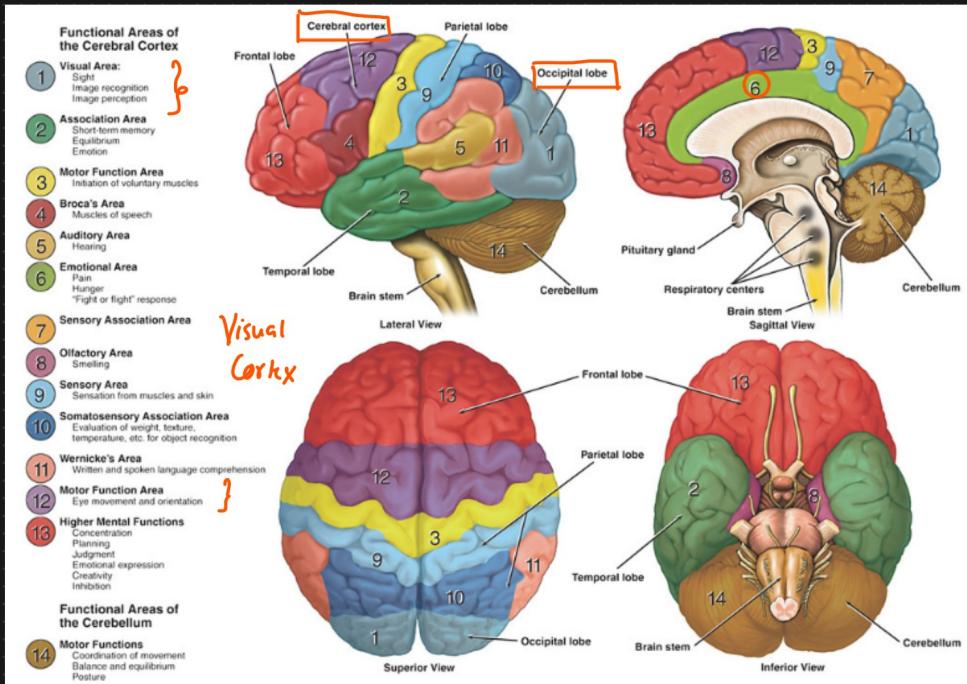


Convolutional Neural N/w



<https://www.dana.org>

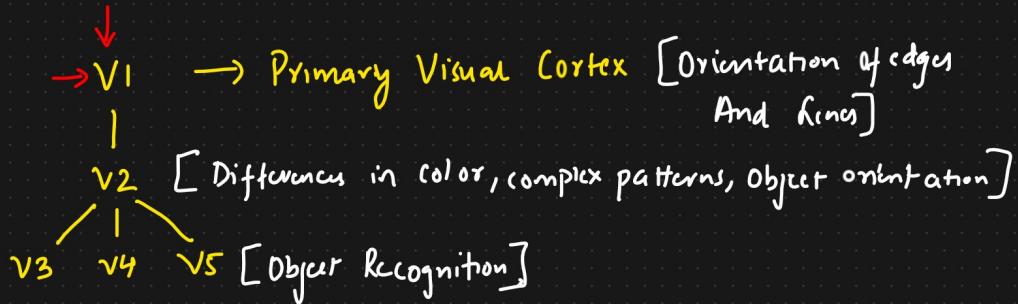
① ANN → Supervised Learning →
 Classification
 Regression

Dataset : I/p features O/P

② CNN : I/p ⇒ Images Eg: Image classification,
 Object Detection, Segmentation

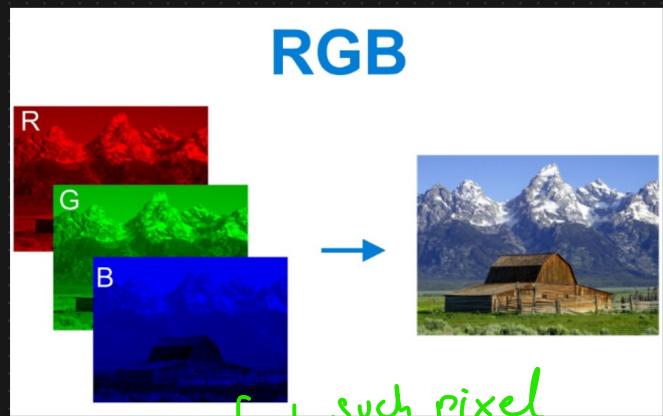
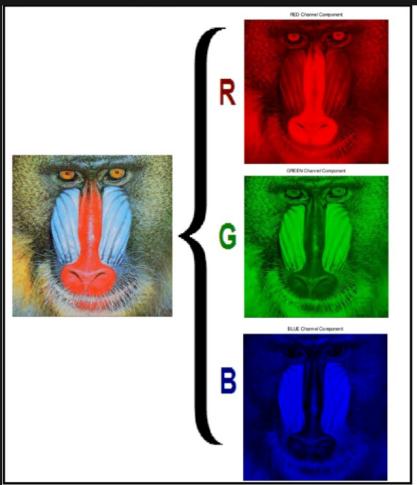
② Cerebral Cortex And Visual Cortex

Visual Cortex (VI-V5) [Region of the brain that receives, integrates and processes visual information relayed from the retinas].

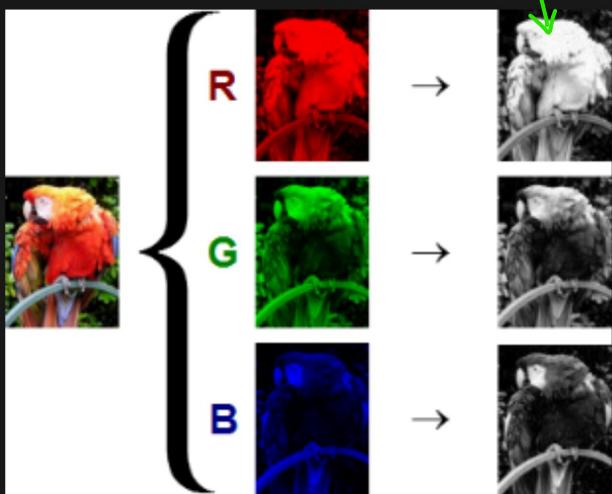


Visualize the Image

③ RGB Images And Gray Scale Images



<https://www.researchgate.net/>



<https://commons.wikimedia.org/>

So $M \times N \times K$ info each pixel can hold
within height width

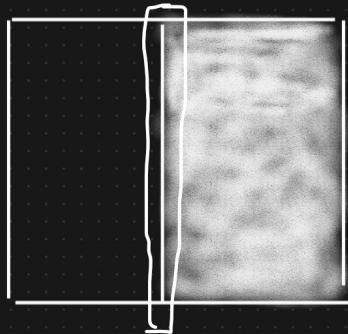
④ Convolution Operation In CNN

$\rightarrow (0,1)$

0	0	0	255	255	255
0	0	0	255	255	255
0	0	0	255	255	255
0	0	0	255	255	255
0	0	0	255	255	255
0	0	0	255	255	255

$6 \times 6 \times 1$

\Rightarrow



Convolution operation

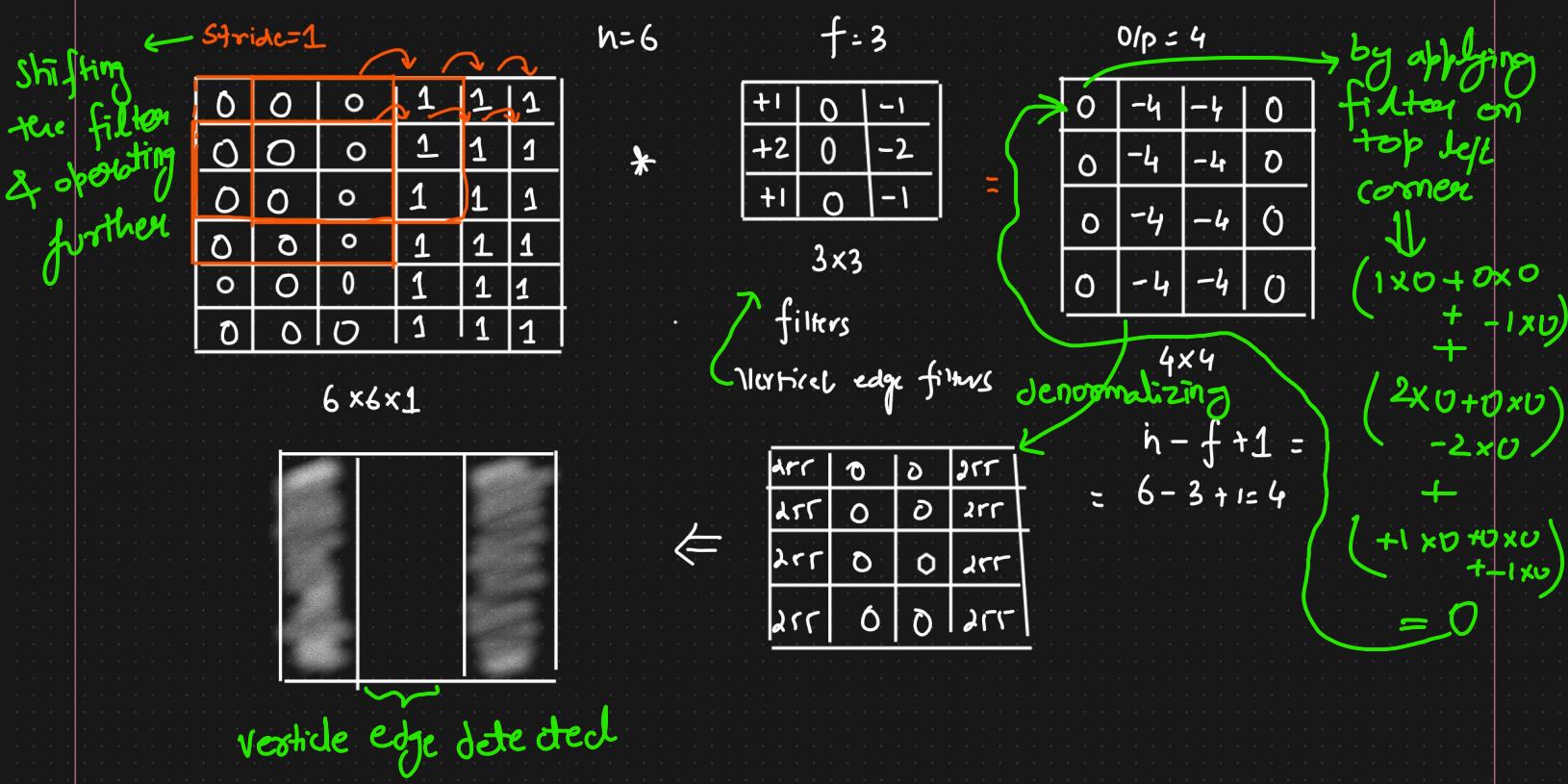
Step 1

① Normalize

Divide by 255

horizontal edge filter type

+1	+2	-1
0	0	0
-1	-2	-1



We randomly initialise filter values & correct values are determined by forward & back propagation. So in CNN filter is parameter.

formula for o/p image size = $n-f+1$
 $= 6-3+1 = 4 \rightarrow 4 \times 4$ image

$6 \times 6 \rightarrow 4 \times 4 \Rightarrow$ losing info \Rightarrow apply padding

0	0	o		
0	o	o		
0	0	o		
0	o	o		
o	o	o		
0	0	o		
0	o	o		

*

+1	0	-1
+2	0	-2
+1	0	-1

0	-4	-4	0
0	-4	-4	0
0	-4	-4	0
0	-4	-4	0