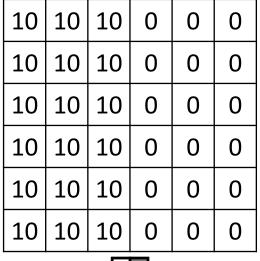


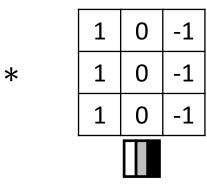
# Convolutional Neural Networks

# More edge detection

#### Vertical edge detection examples

\*

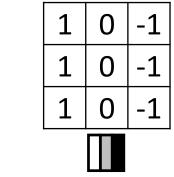




0	30	30	0		
0	30	30	0		
0 30 30 0					
0 30 30 0					

->			
0	0	10	

0	0	0	10	10	10
0	0	0	10	10	10
0	0	0	10	10	10
0	0	0	10	10	10
0	0	0	10	10	10
0	0	0	10	10	10

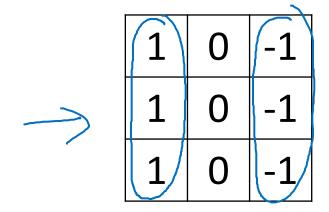


0 -30 -30 0 0 -30 -30 0 0 -30 -30 0	0	-30	-30	0
	0	-30	-30	0
0 -30 -30 0	0	-30	-30	0
	0	-30	-30	0



Andrew Ng

## Vertical and Horizontal Edge Detection



Vertical

10	10	10	0	0	0
10	10	10	0	0	0
10	10	10	0	0	0
0	0	0	10	10	10
0	0	0	10	10	10
0	0	0	10	10	10

1 1 1 0 0 0 -1 -1 -1

Horizontal

1	1
0	0
-1	-1

 0
 0
 0

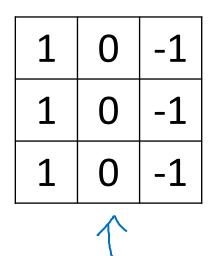
 30
 10
 -10
 -30

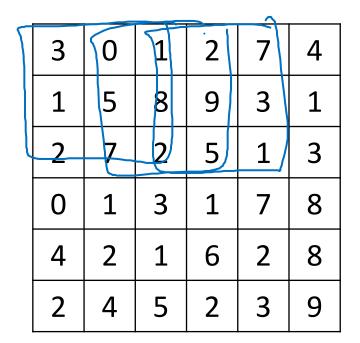
 30
 10
 -10
 -30

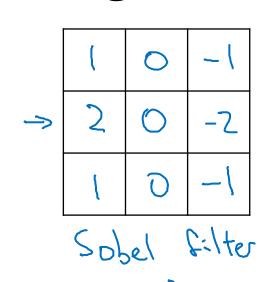
 0
 0
 0
 0



### Learning to detect edges







Ce	nustuti un
	$\widehat{W_1}$ $\widehat{W_2}$ $\widehat{W_3}$
$\times$	$\overline{w_4}$ $\overline{w_5}$ $\overline{w_6}$
	$\overline{w_7} \overline{w_8} \overline{w_9}$
	7,43

2	0	7
0	0	10
3	5	-3
Schorr Filter		



