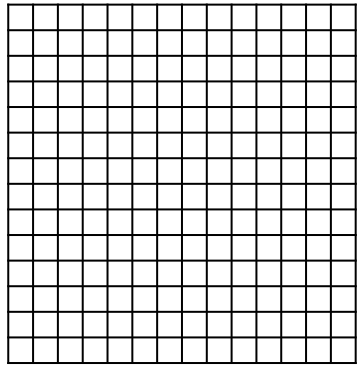
deeplearning.ai

Convolutional Networks in 1D or 3D

- Images are 2D
- However, this works with 1D and 3D as well

1D and 3D generalizations of models

Convolutions in 2D and 1D

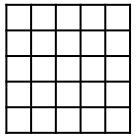


2D input image

$14 \times 14 \times 3$ channels

*

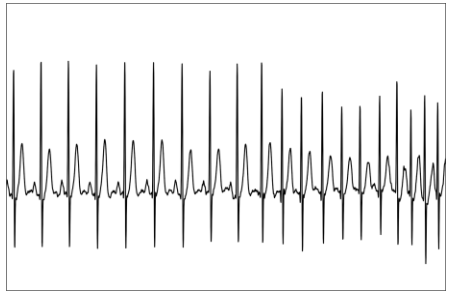
16 Filters



2D filter

$5 \times 5 \times 3$ channels

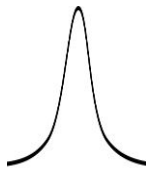
→ $10 \times 10 \times 16$



A	B	C	D	E	F	G	H	I
1	20	15	3	18	12	4	17	

Time series showing the voltage at each time step.

*



1	3	10	3	1

↳ 5×1 dim Filter

In 2D Image, we applied sliding window for the filter to get the 10×10 Image

We can Apply sliding window to 1D data as well

A→F C→H etc

B→G

14 * 5

↳ 10

If you had more channels/Filters that info would also translate similar to 2D data.

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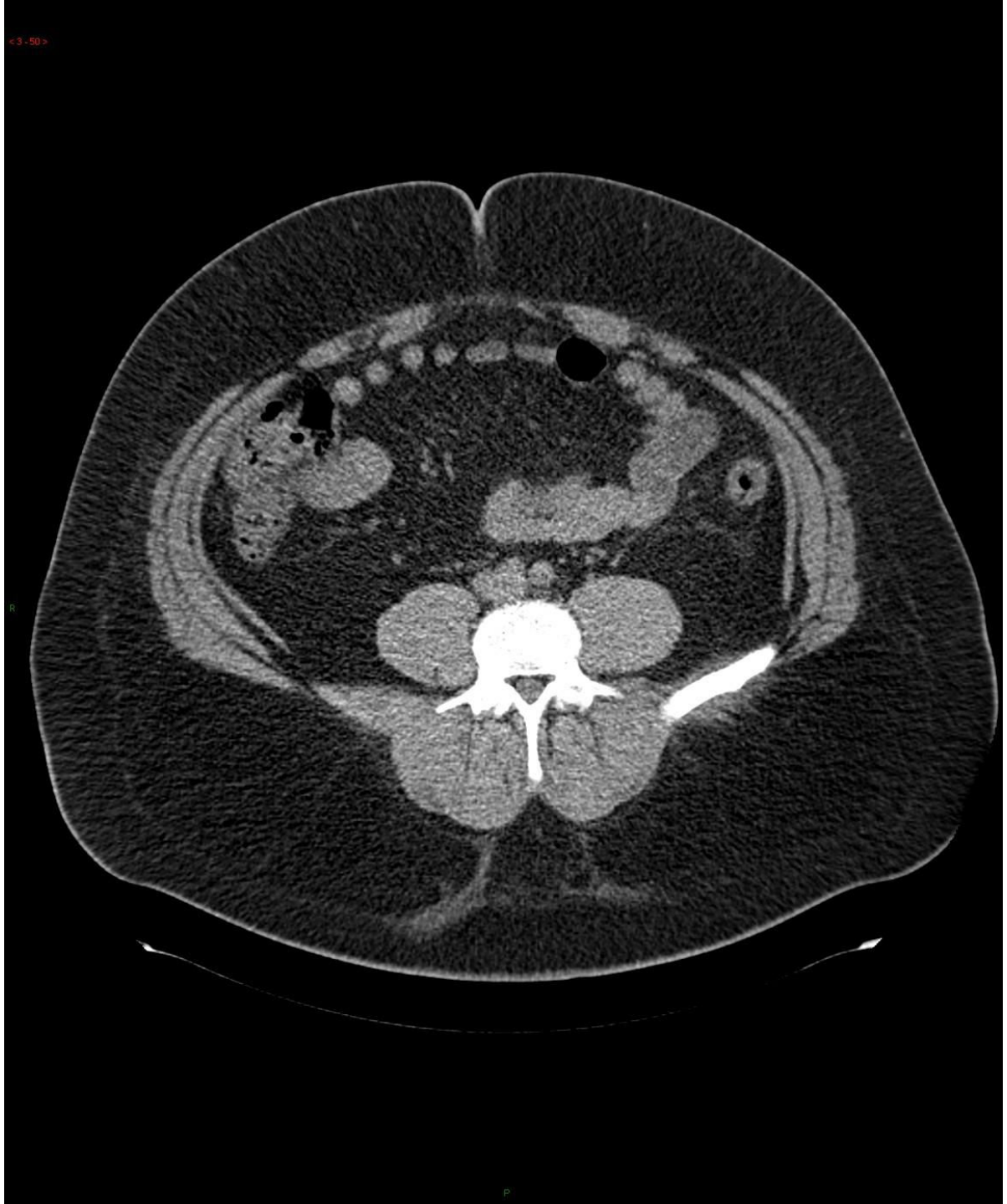
3D data

(Next couple of slides are different Angles of the same Image)



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3D data

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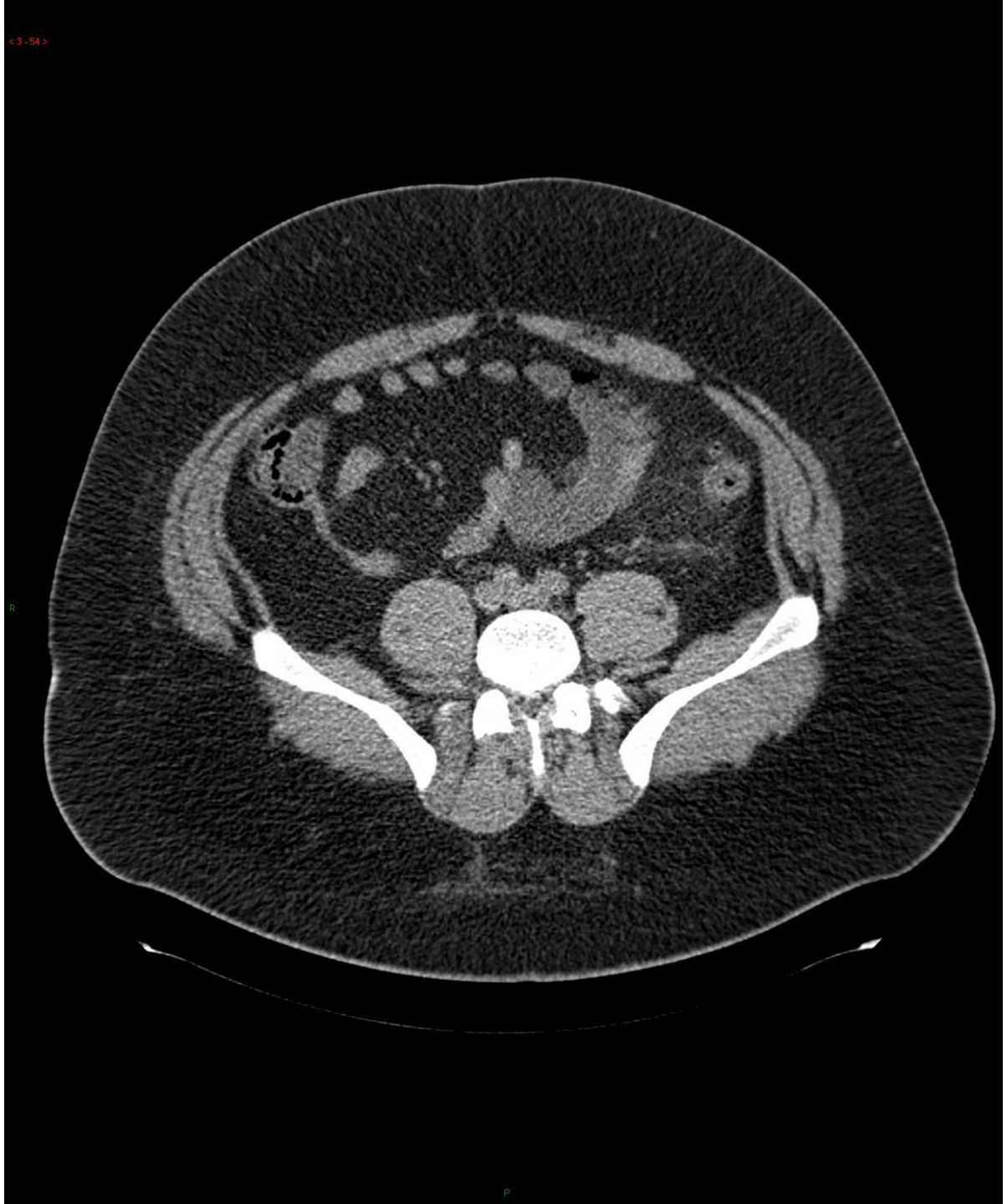
3D data



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3D data

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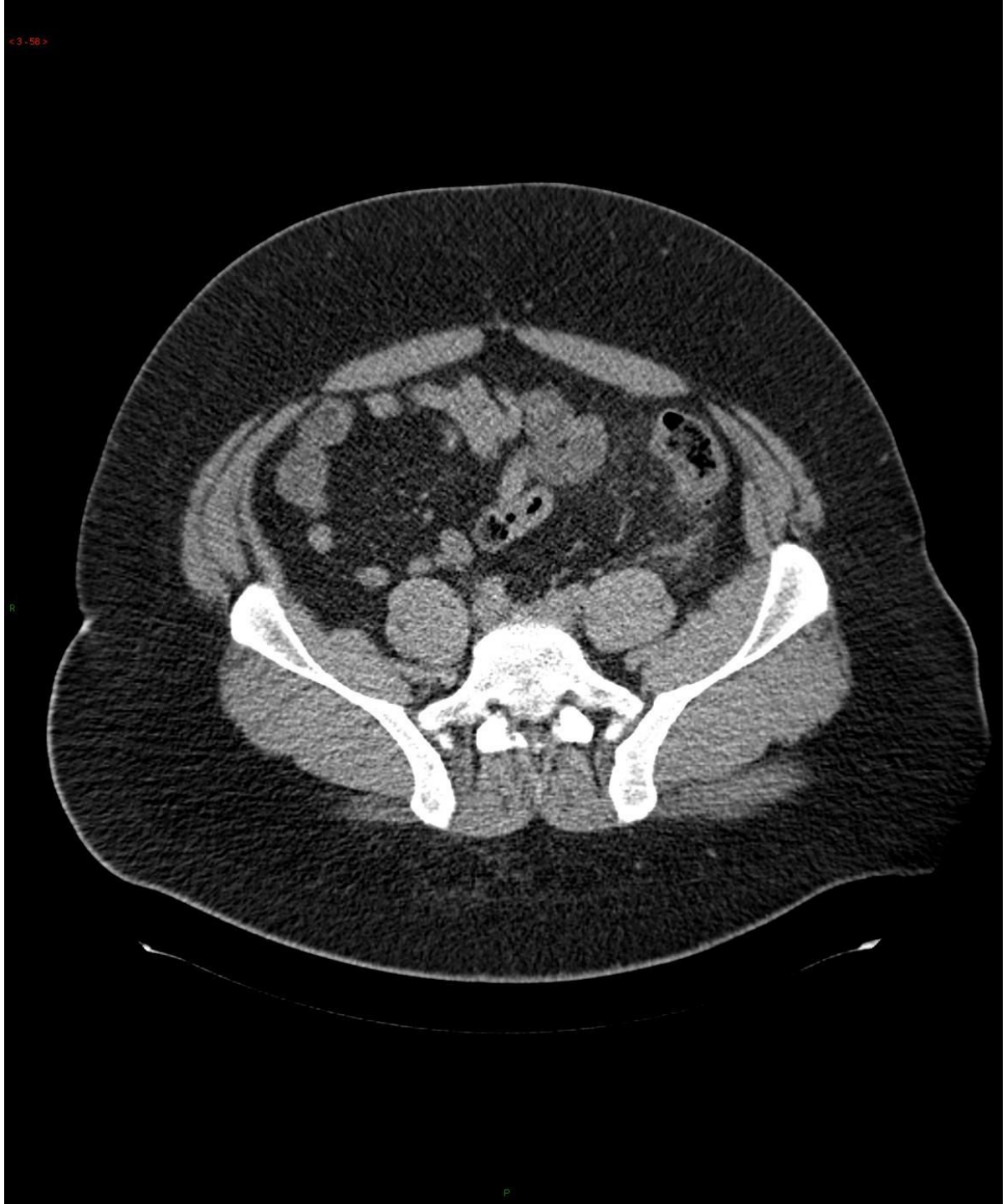
3D data



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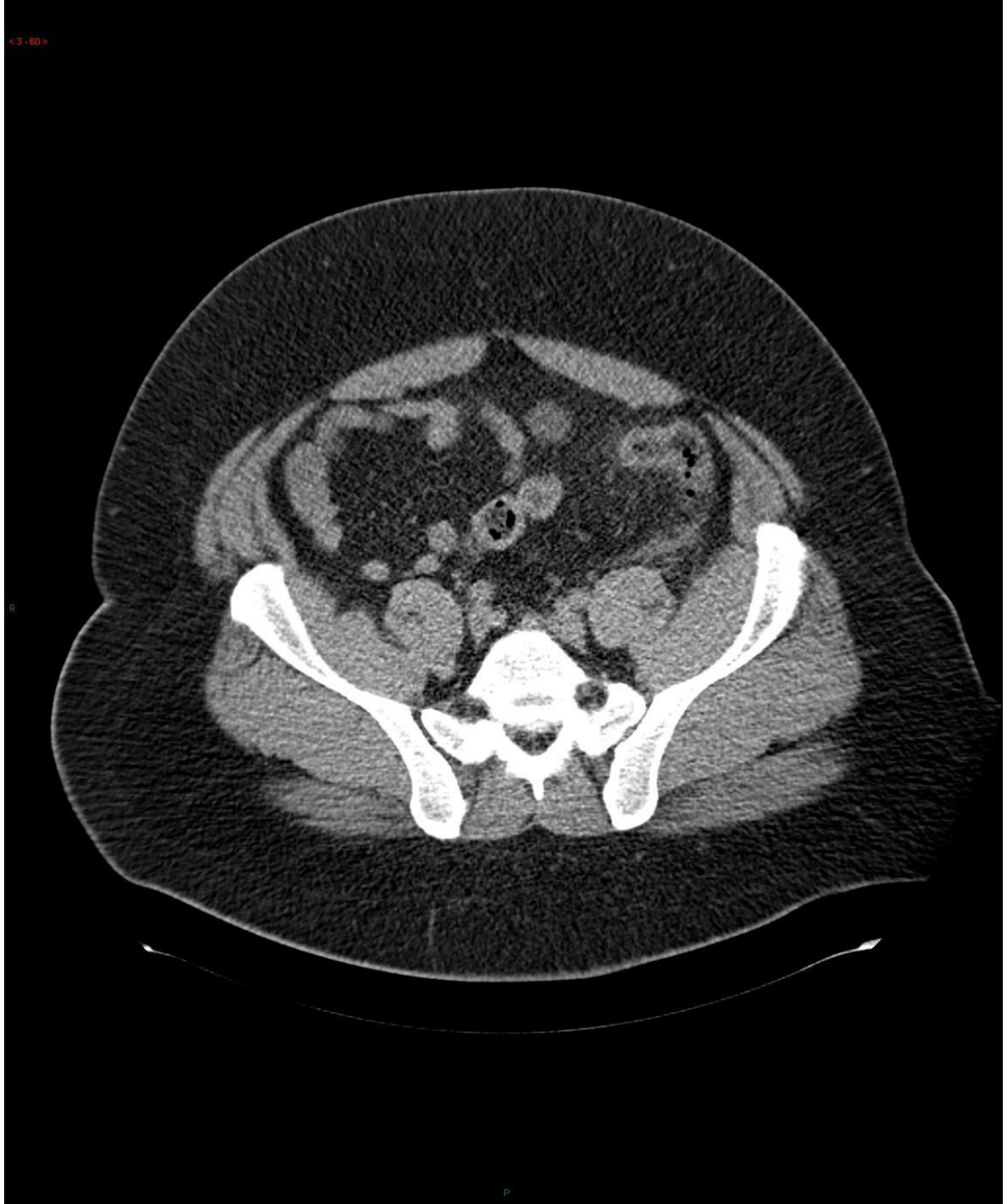
3D data



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3D data

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3D data

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3D data

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3D data

Andrew Ng

3D data

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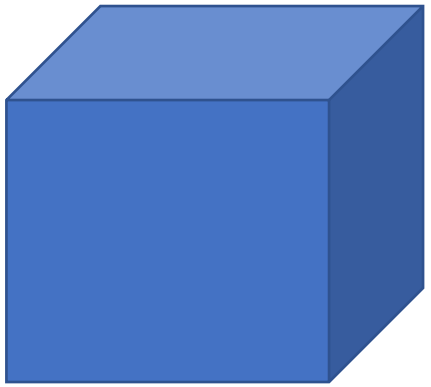
3D convolution



3D volume

Say 14x14x14 x 1

↳ 1 channel

*

16 Filters

3D filter

5x5x5 x1

↳ 1 channel

10x10x10x16

Another eg

= Movie data

3rd dim = Time