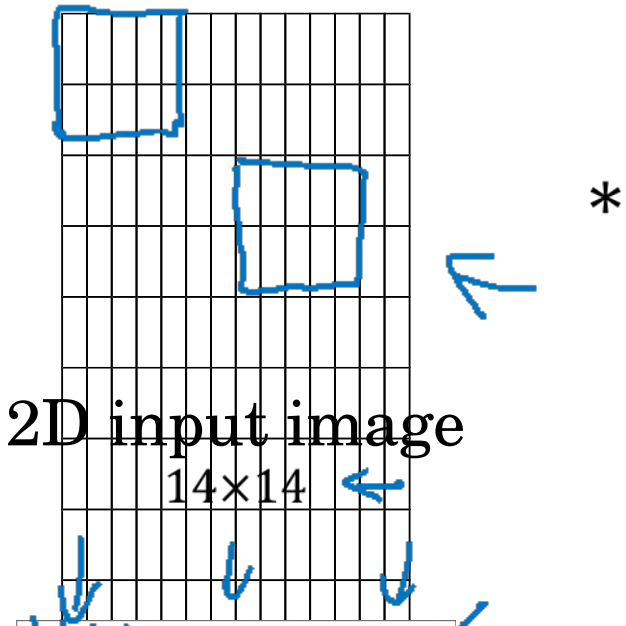
Convolutional Networks in 1D or 3D

deeplearning.ai

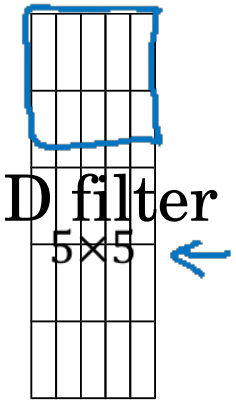
1D and 3D generalizations of models

Convolutions in 2D and 1D



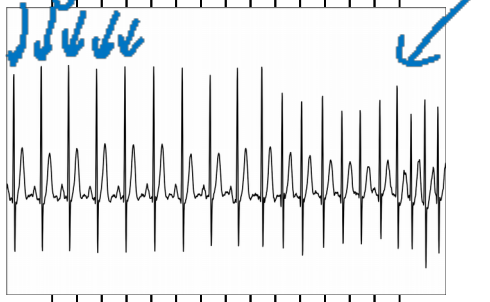
2D input image
14×14

*



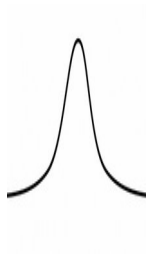
2D filter
5×5

*



1 20 15 3 18 12 4 17

14



1 3 10 3 1

5

$14 \times 14 \times 3 \quad * \quad 5 \times 5 \times 3$

$\rightarrow 10 \times 10 \times 16$

$10 \times 10 \times 16 \quad * \quad 5 \times 5 \times 16$

$\rightarrow 6 \times 6 \times 32$

$14 \times 1 \quad * \quad 5 \times 1$

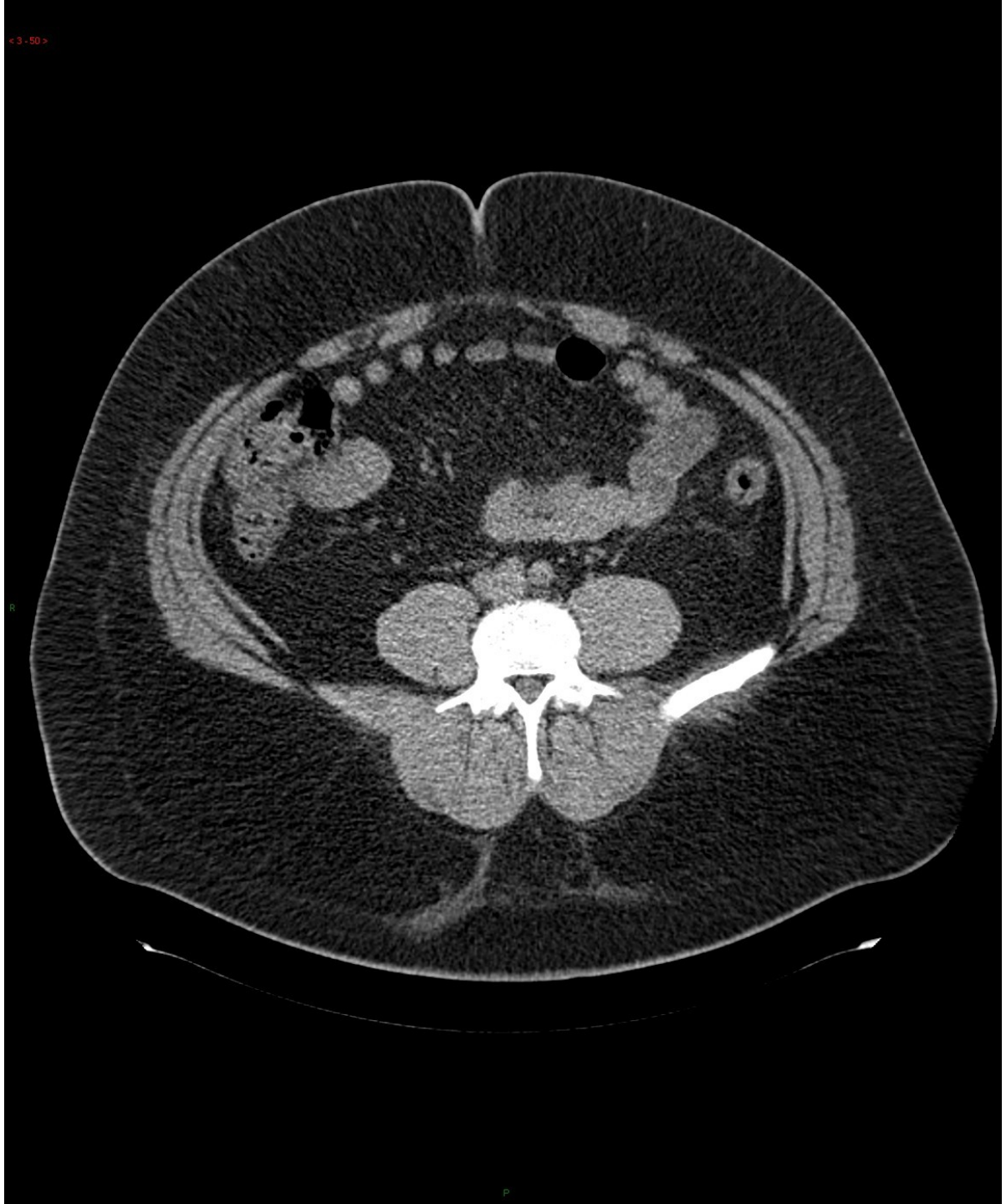
$\rightarrow 10 \times 16$

$10 \times 16 \quad * \quad 5 \times 16$

$\rightarrow 6 \times 32$

Andrew Ng

3D data



Andrew Ng

3D data

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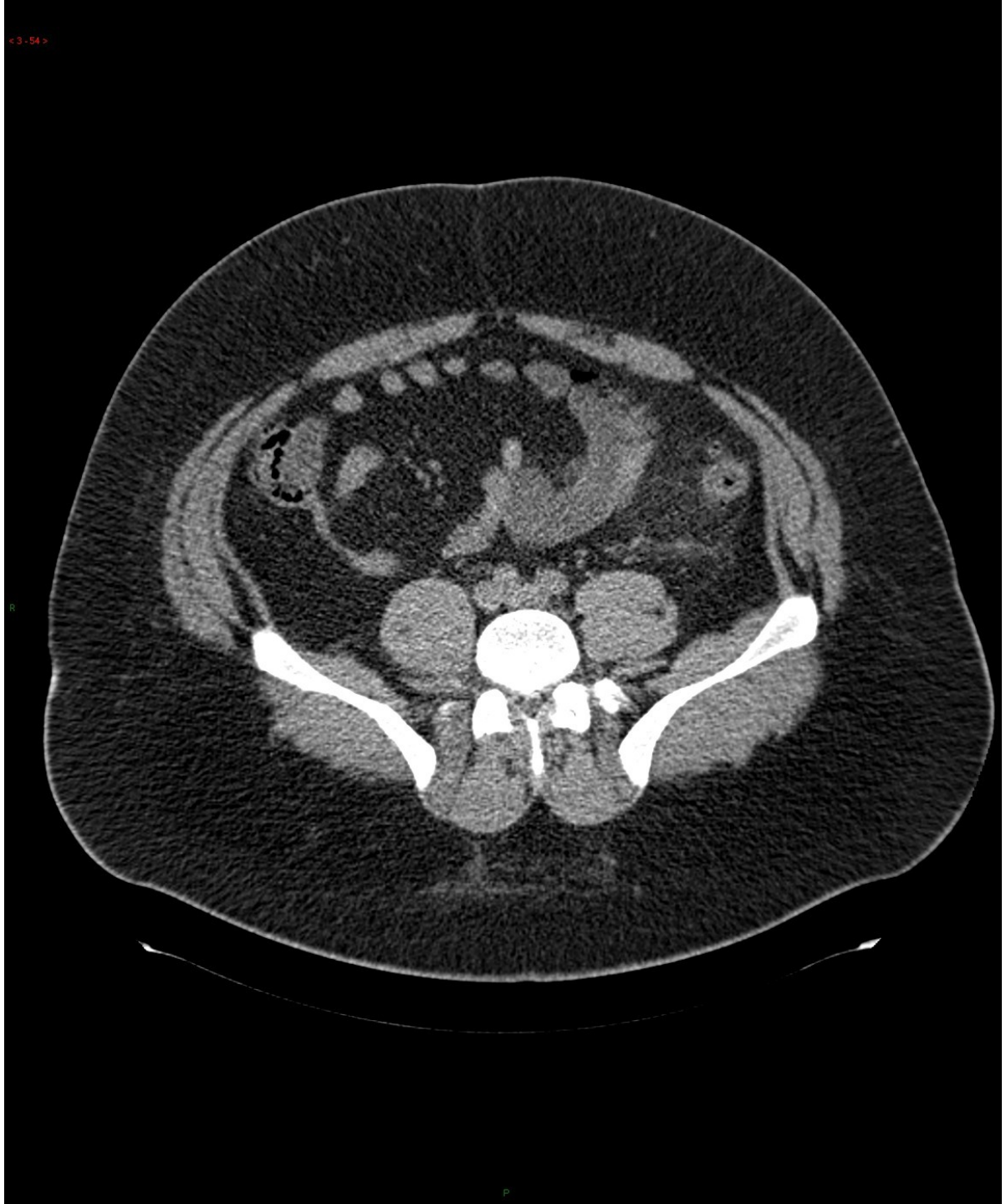
3D data



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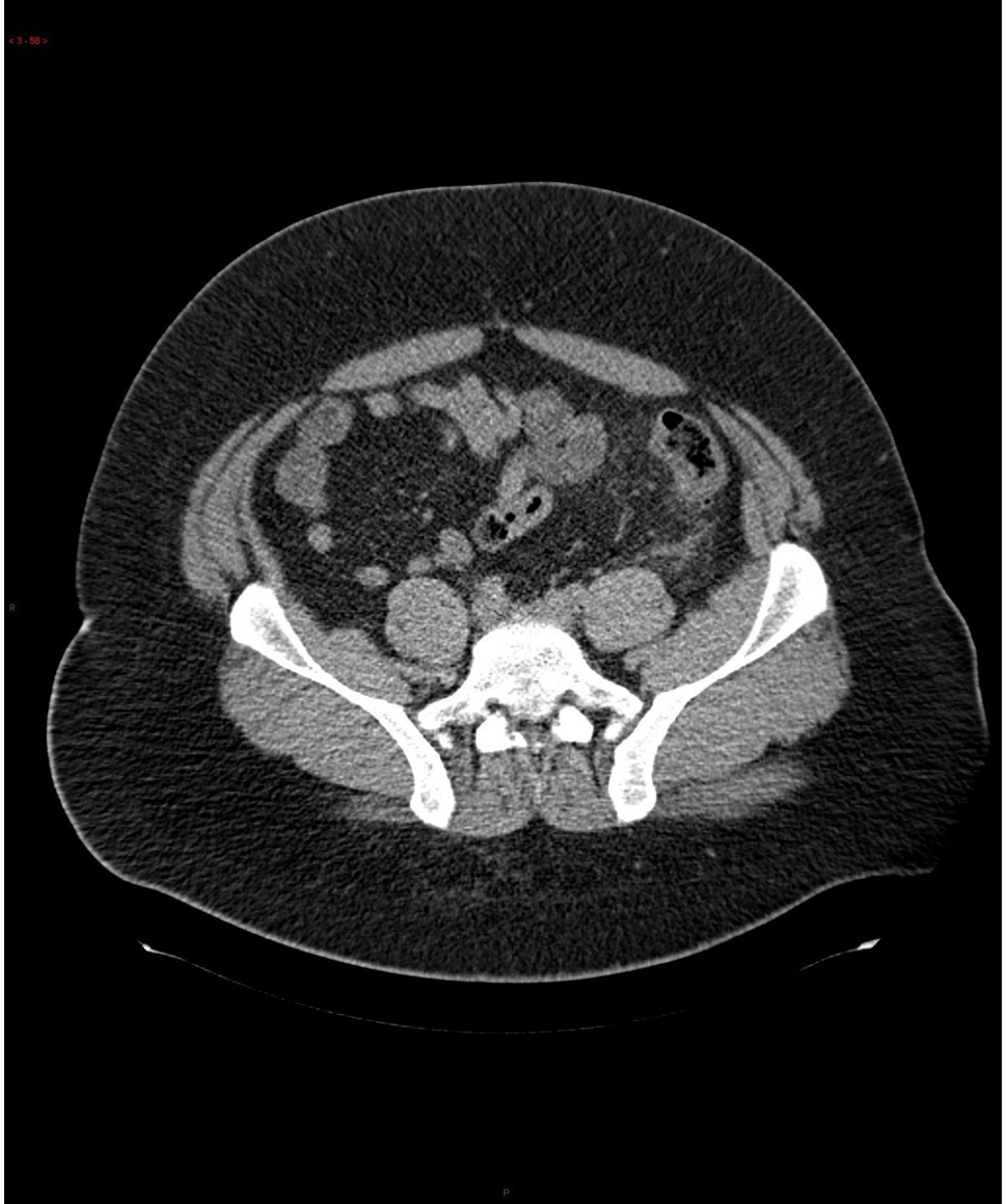
3D data

3D data



3D data

Andrew Ng

3D data

Andrew Ng

3D data

Andrew Ng

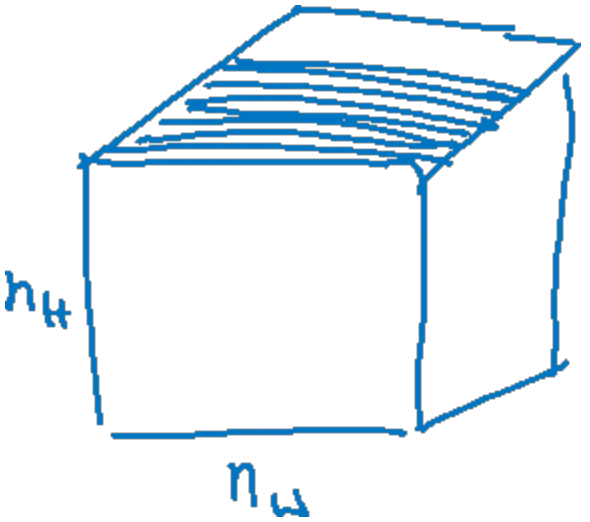
3D data

Andrew Ng

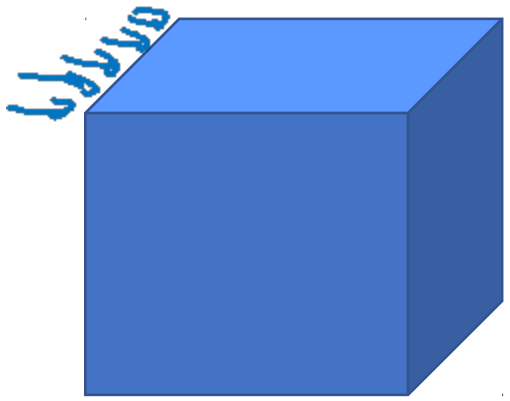
3D data

Andrew Ng

3D data

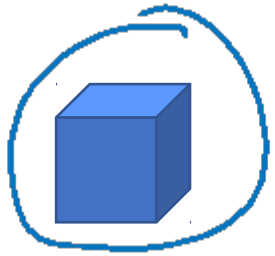


3D convolution



3D volume

*



3D filter

n_c

$14 \times 14 \times 14 \times 1$

$* \quad 5 \times 5 \times 5 \times 1$ 16 filters.

$\rightarrow 10 \times 10 \times 10 \times 16$

$* \; 5 \times 5 \times 5 \times 16$

32 filters

$\rightarrow \quad 6 \times 6 \times 6 \times 32$