



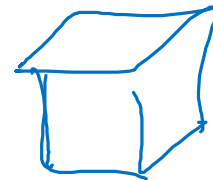
deeplearning.ai

# Convolutional Networks in 1D or 3D

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1D and 3D  
generalizations of  
models

# Convolutions in 2D and 1D



$$14 \times 14 \times \underline{3} * 5 \times 5 \times \underline{3}$$

$$\rightarrow \underline{10 \times 10 \times 16}$$

$$10 \times 10 \times \underline{16} * 5 \times 5 \times \underline{16}$$

$$\rightarrow \underline{6 \times 6 \times 32}$$



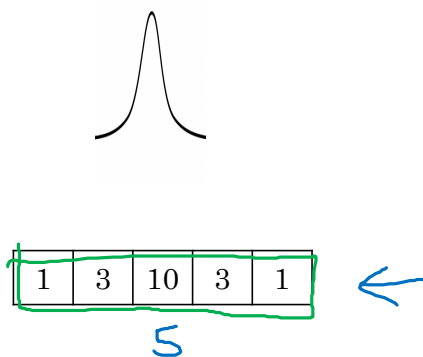
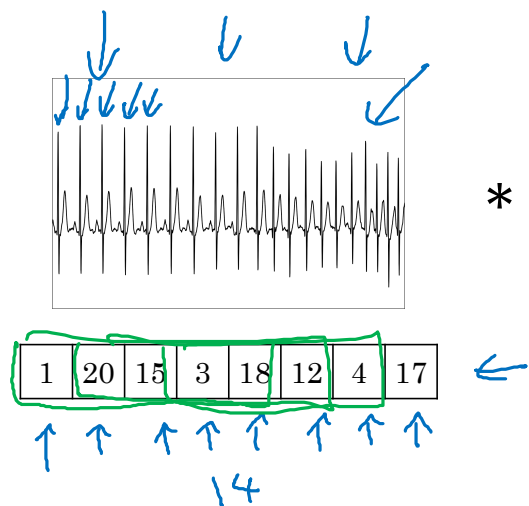
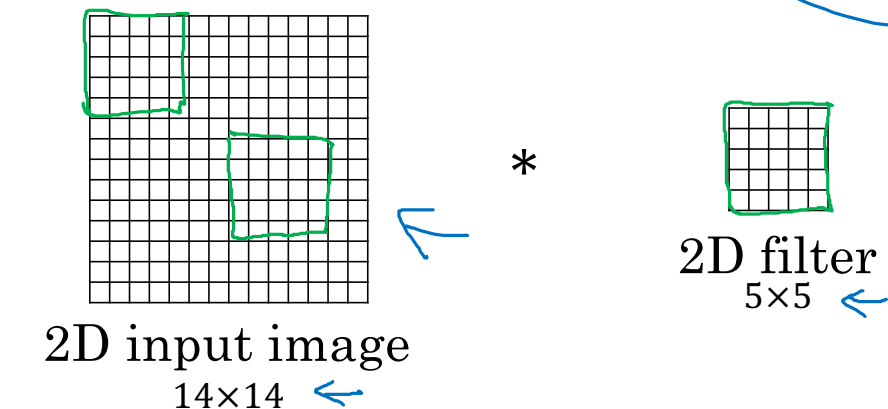
$$14 \times \underline{1} * 5 \times \underline{1}$$

$$\rightarrow \underline{10 \times 16}$$

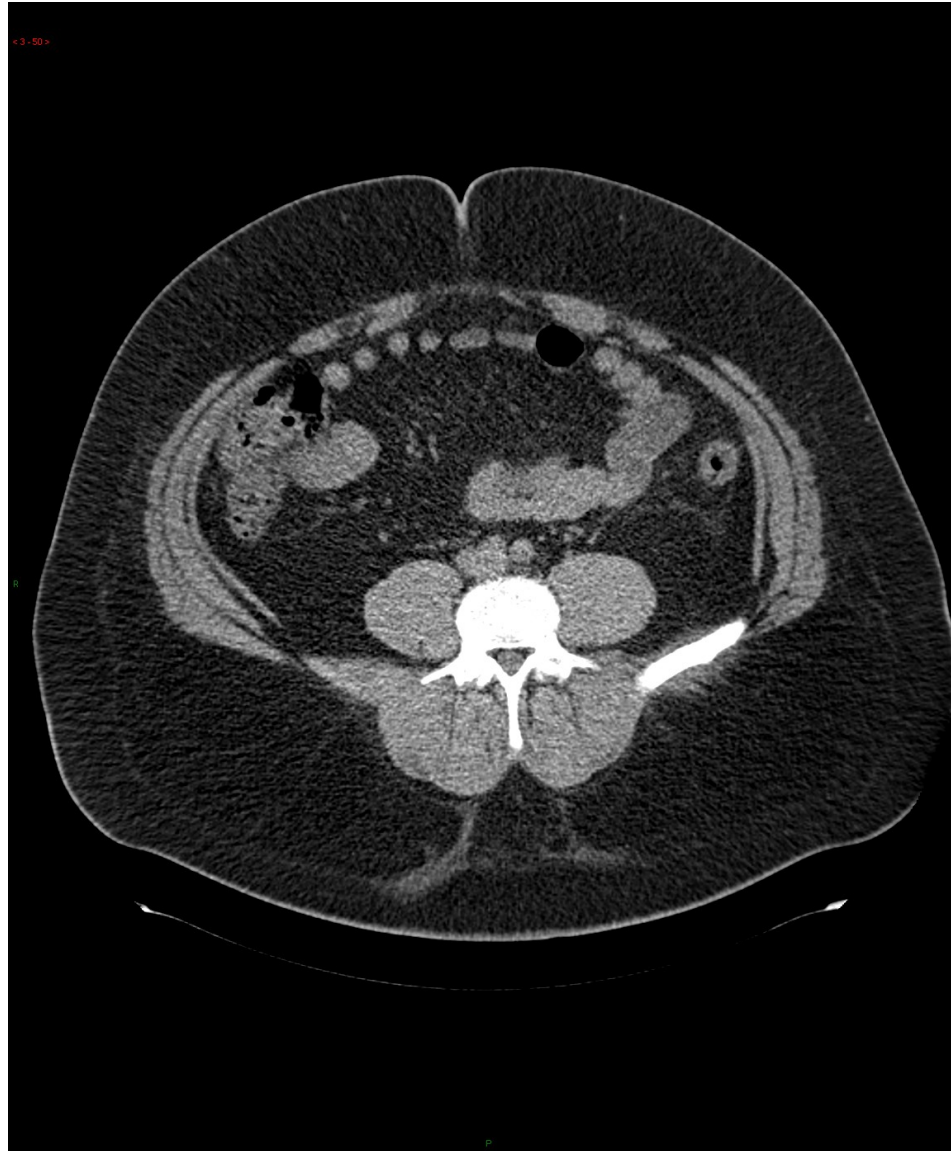
$$10 \times \underline{16} * 5 \times \underline{16}$$

$$\rightarrow \underline{6 \times 32}$$

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3D data



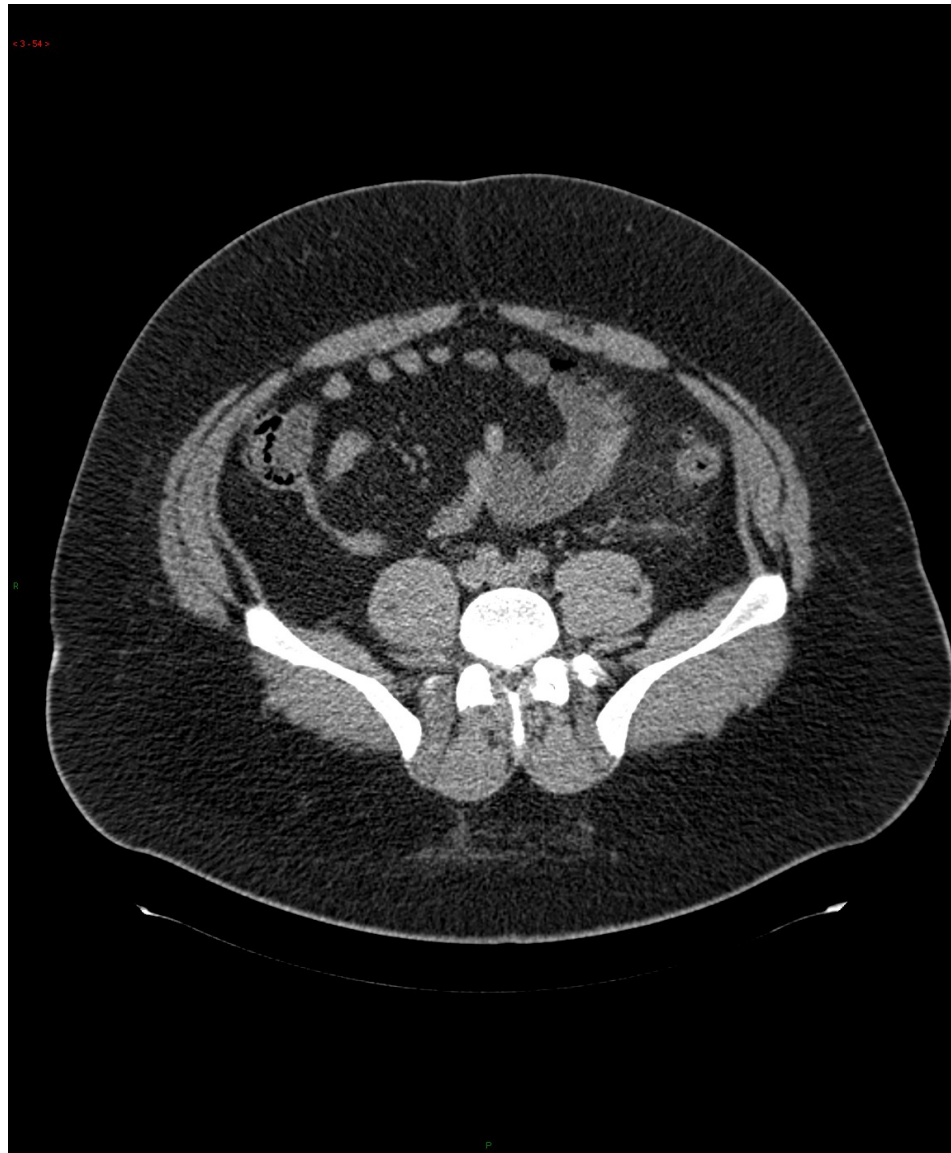
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3D data



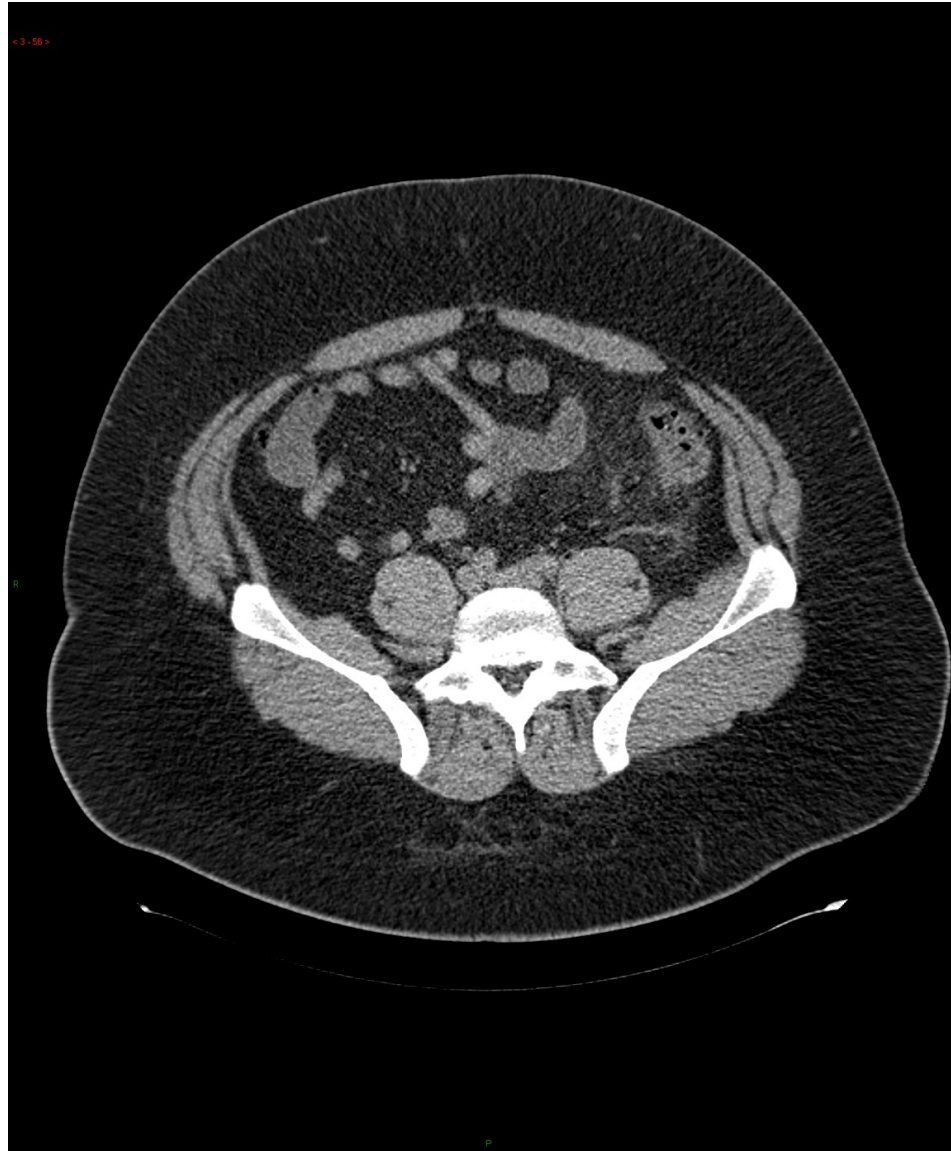
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3D data



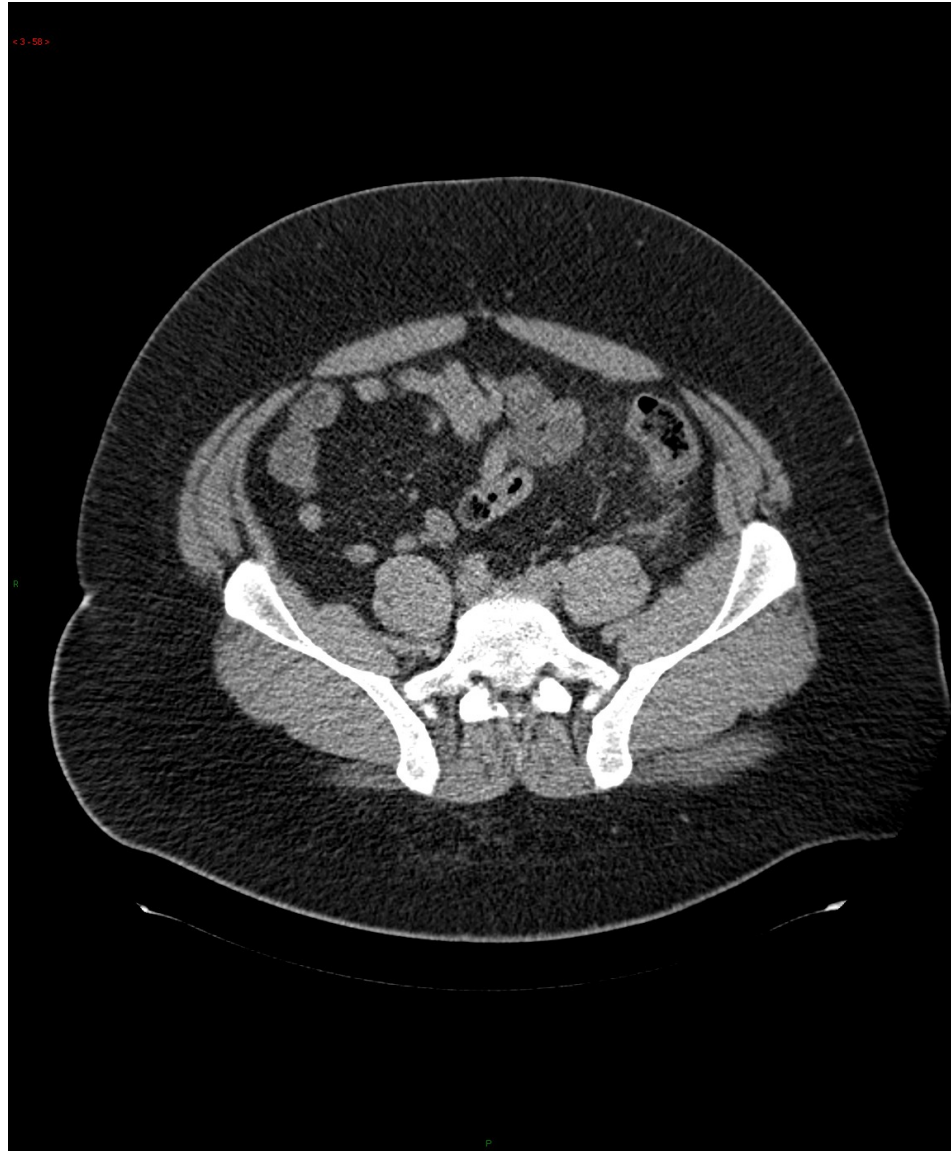
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3D data



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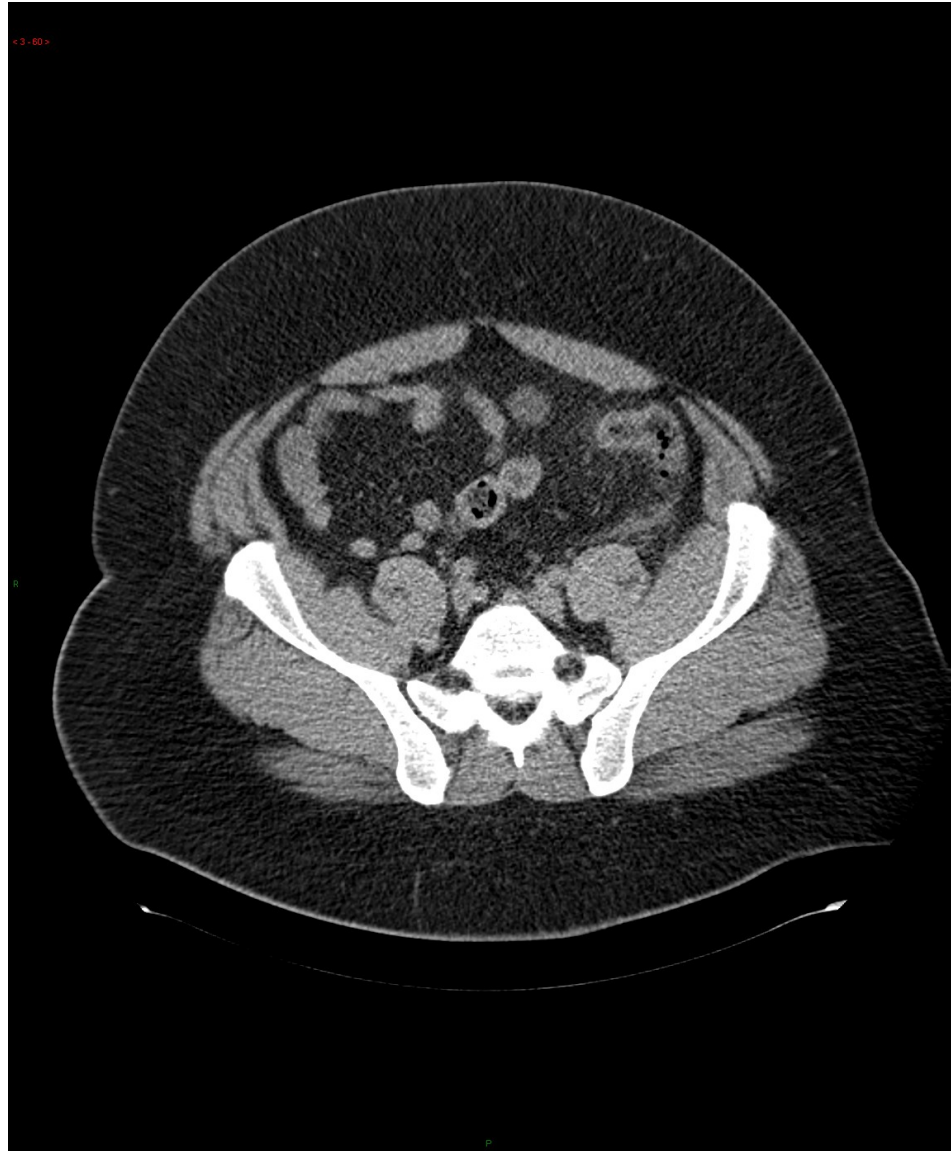
3D data



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3D data



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3D data



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3D data



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3D data



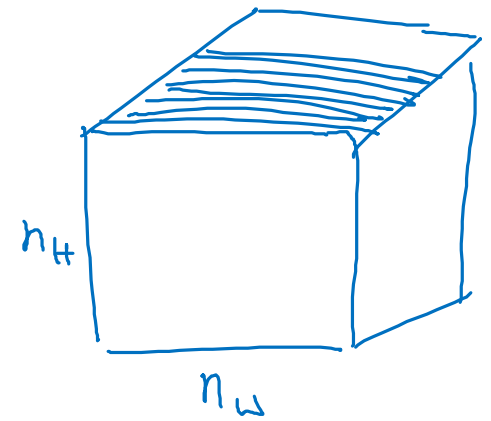
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3D data



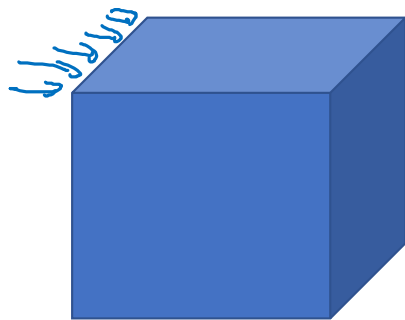
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3D data



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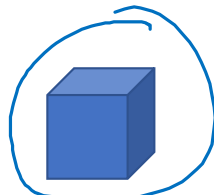
# 3D convolution



3D volume



\*



3D filter

$$\begin{array}{l}
 \downarrow \quad \downarrow \quad \downarrow \quad \downarrow n_c \\
 \underline{14 \times 14 \times 14} \times \underline{1} \\
 * \quad \underline{5 \times 5 \times 5} \times \underline{1} \quad 16 \text{ filters} \\
 \rightarrow 10 \times 10 \times 10 \times \underline{16} \\
 * \quad \underline{5 \times 5 \times 5} \times \underline{16} \quad 32 \text{ filters} \\
 \rightarrow 6 \times 6 \times 6 \times 32
 \end{array}$$