

Convolutional Neural Networks in Medical Imaging

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Outline

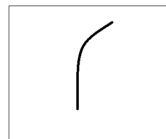
- Introduction - A brief look at CNNs and biological image segmentation in a broader scope.
- Background - Information about basic structural concepts for CNNs
- Methods used by Havaei, et al.
- Methods used by Kamnitsas, et al.
- Results
- Conclusions

Kernels

- Kernels, neurons and filters are interchangeable names
- Kernels are an array based representation of image features

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

Pixel representation of filter



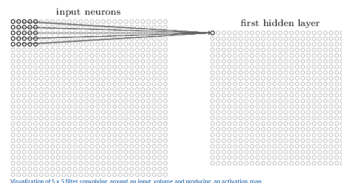
Visualization of a curve detector filter

Kernel

<https://adeshpande3.github.io/>

Convolutional Layers

- Convolutional Layers are where CNNs get their name
- Every CNN starts with a convolutional layer
- The Kernel slides or "convolves" around the input image
- The results of the convolutions are stored in the feature map



Feature Map

<https://adeshpande3.github.io/>