E9 205 Machine Learning for Signal Procesing

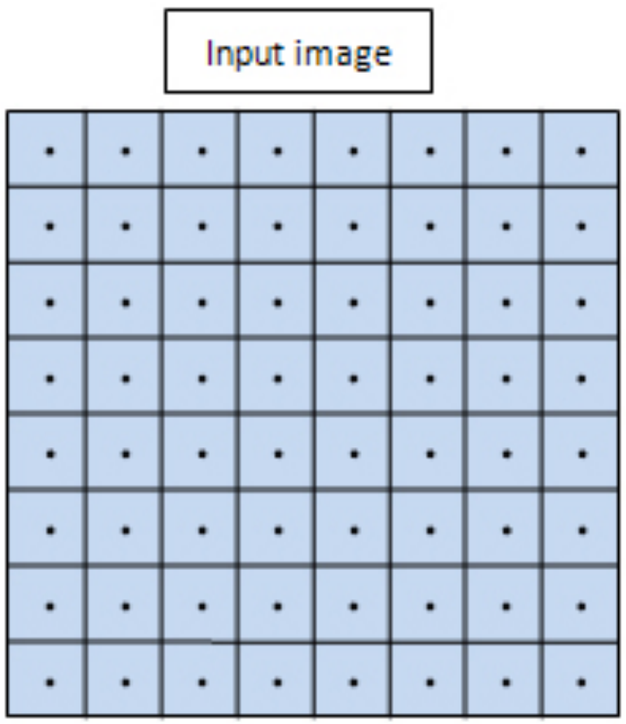
Convolutional Neural Networks

30-10-2019

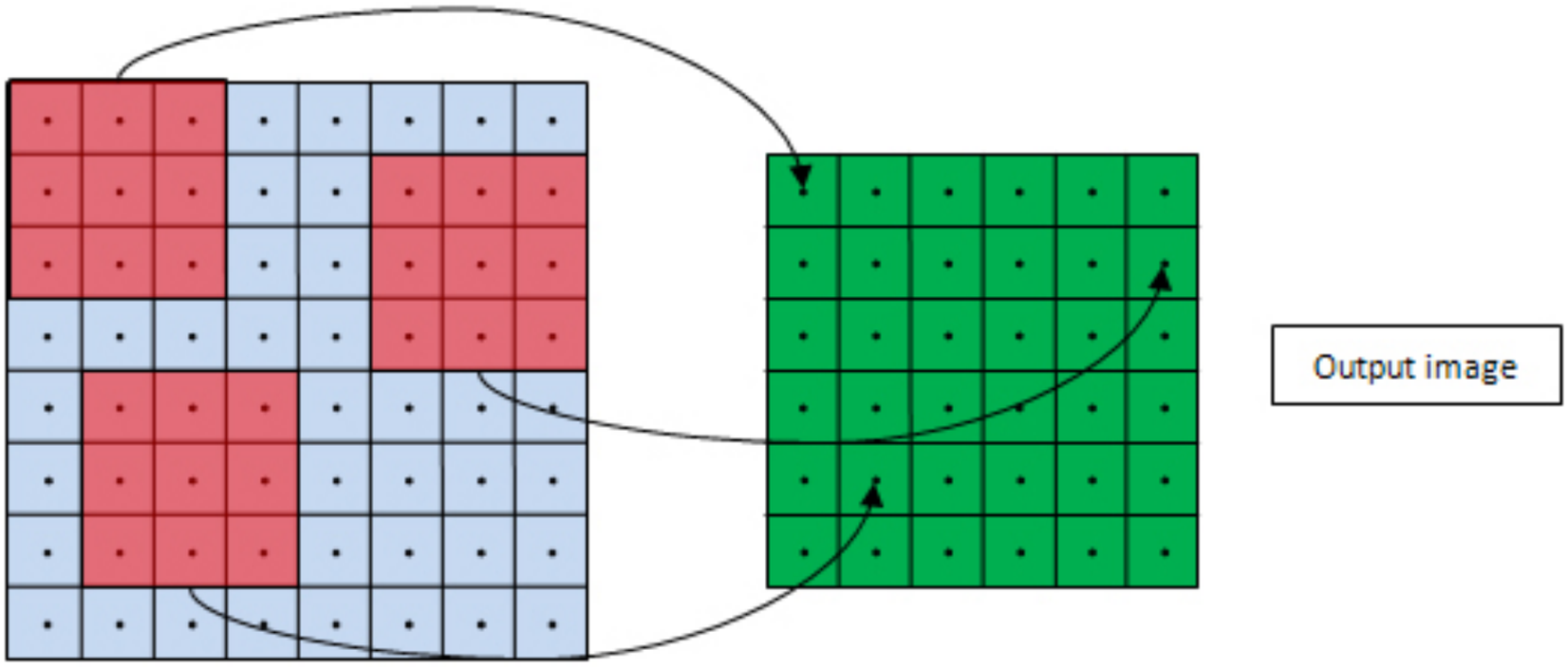
Established 1911

INDIAN INSTITUTE OF SCIENCE
भारतीय विज्ञान संस्थान

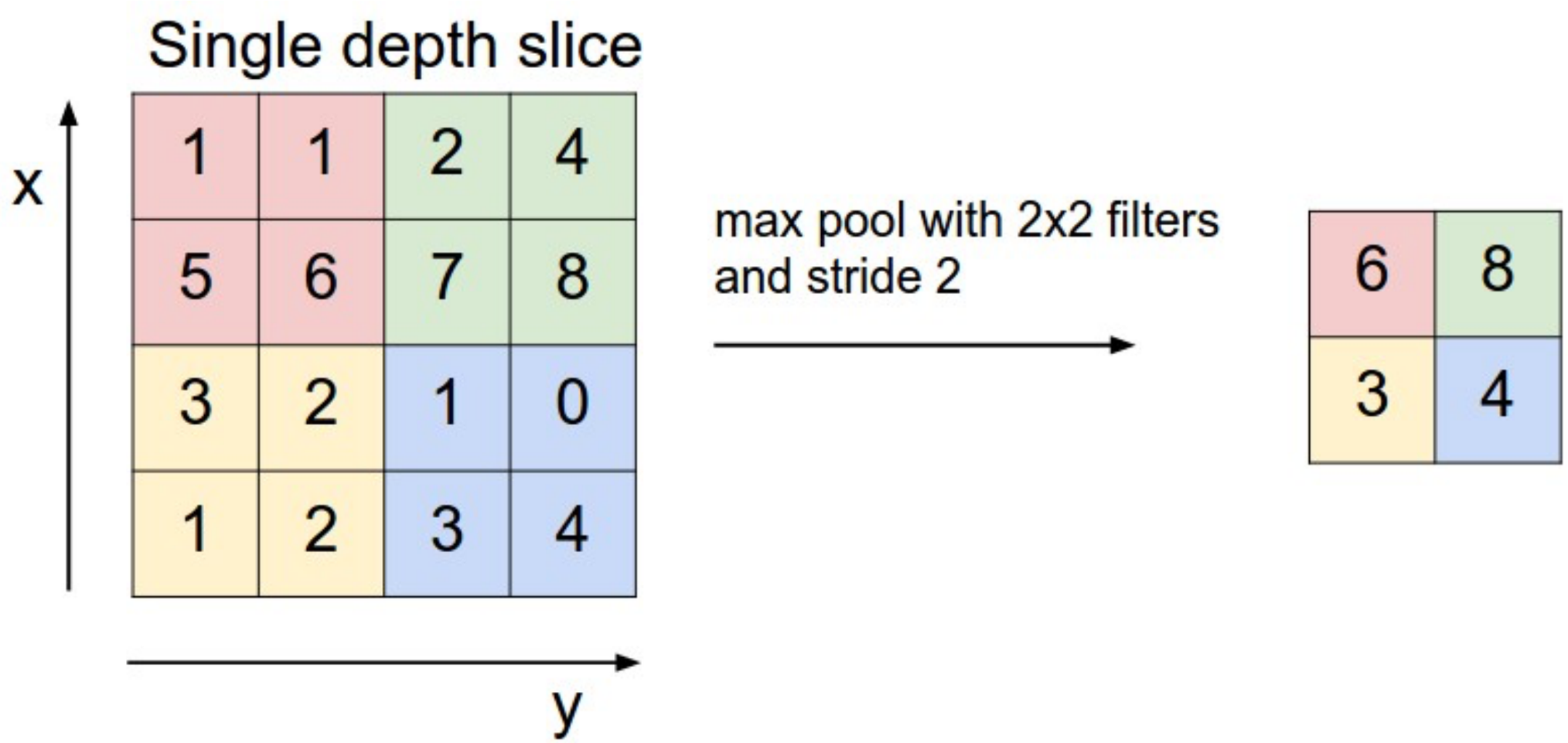
Other Architectures - Convolution Operation



Weight sharing



Max Pooling Operation

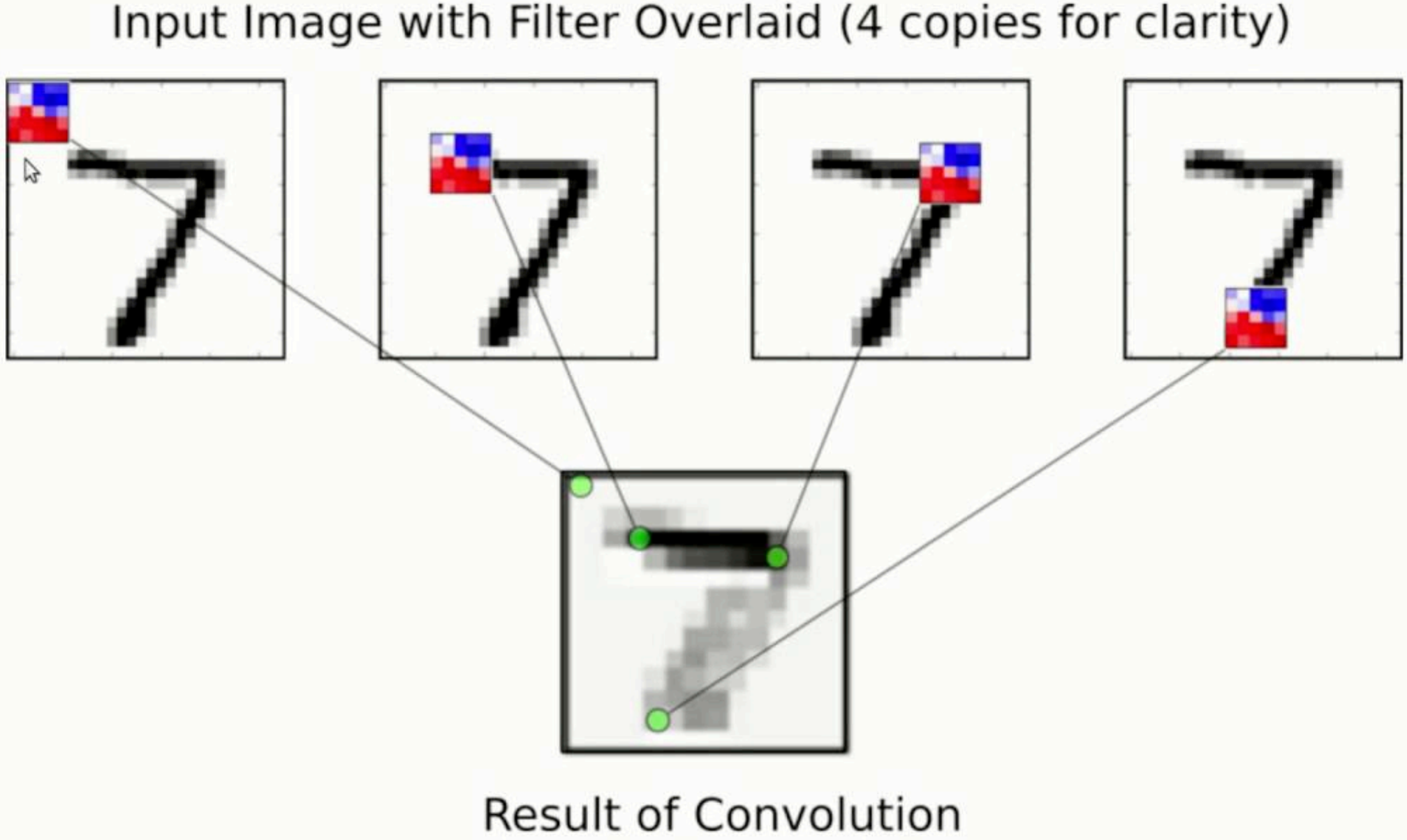


Convolution Operation (Images)

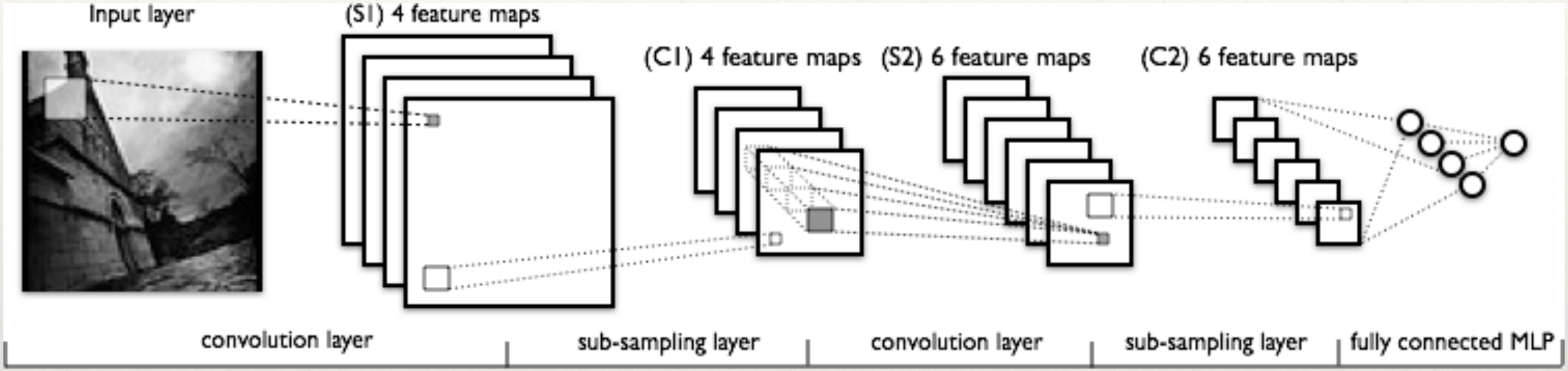
File Edit View Insert Cell Kernel Help Python 3

```
Image('images/02_convolution.png')
```

Out[2]:

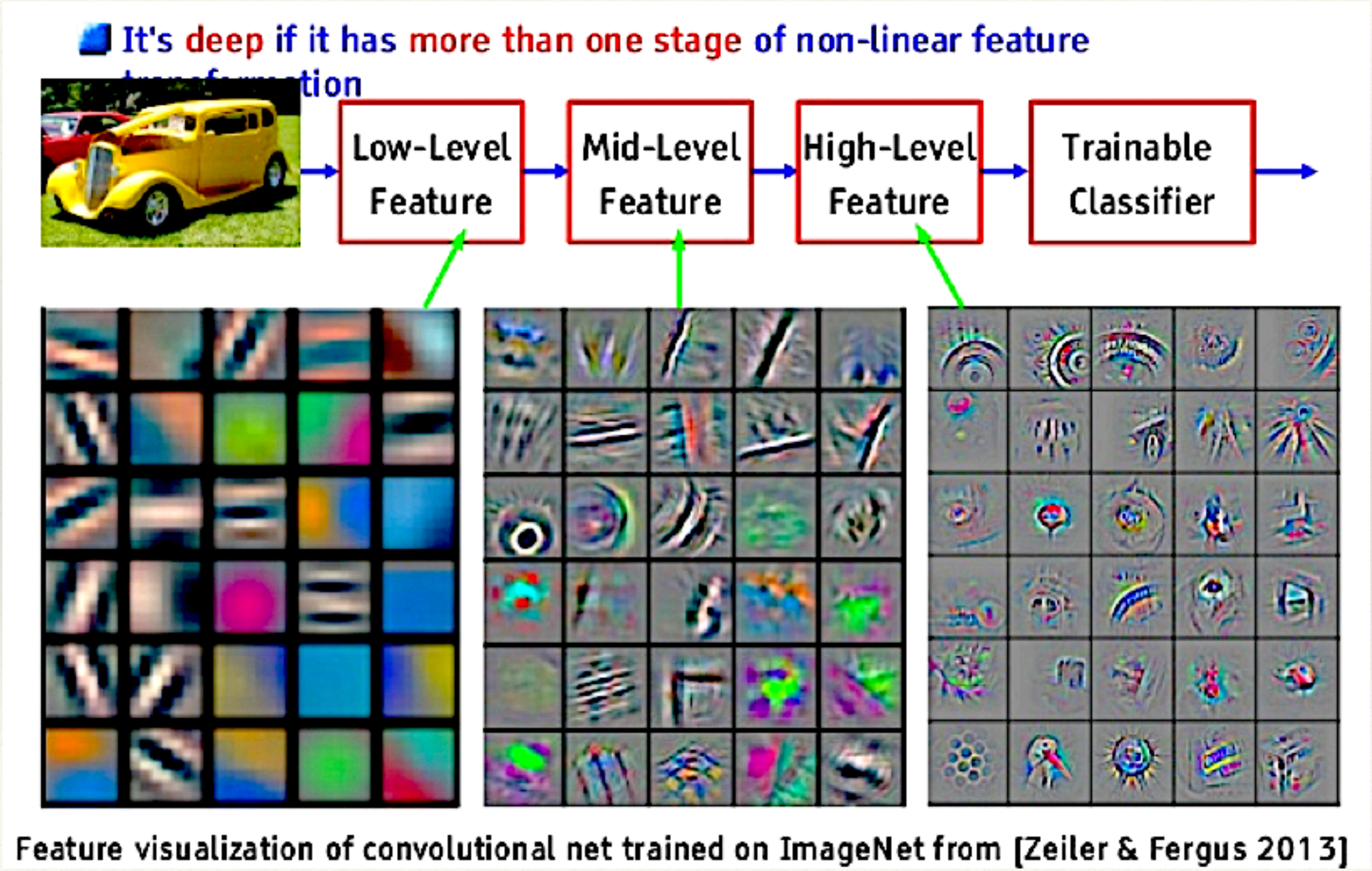


Convolutional Neural Networks



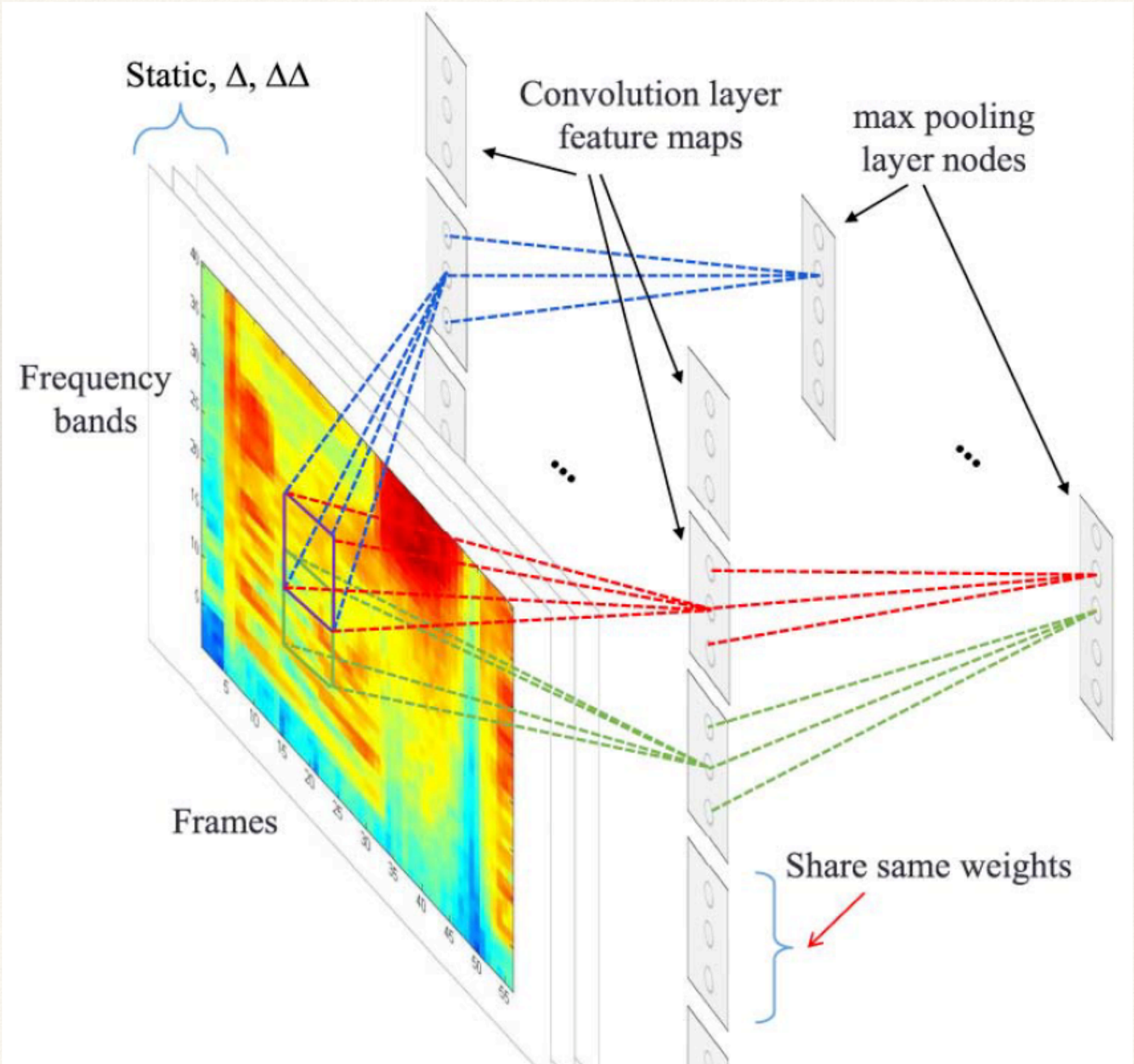
- Multiple levels of filtering and subsampling operations.
- Feature maps are generated at every layer.

Representation Learning in CNNs



Feature visualization of convolutional net trained on ImageNet from [Zeiler & Fergus 2013]

CNNs for Speech and Audio



Speech Recognition
Speaker/Language Recognition

Convolutional Neural Networks on Images

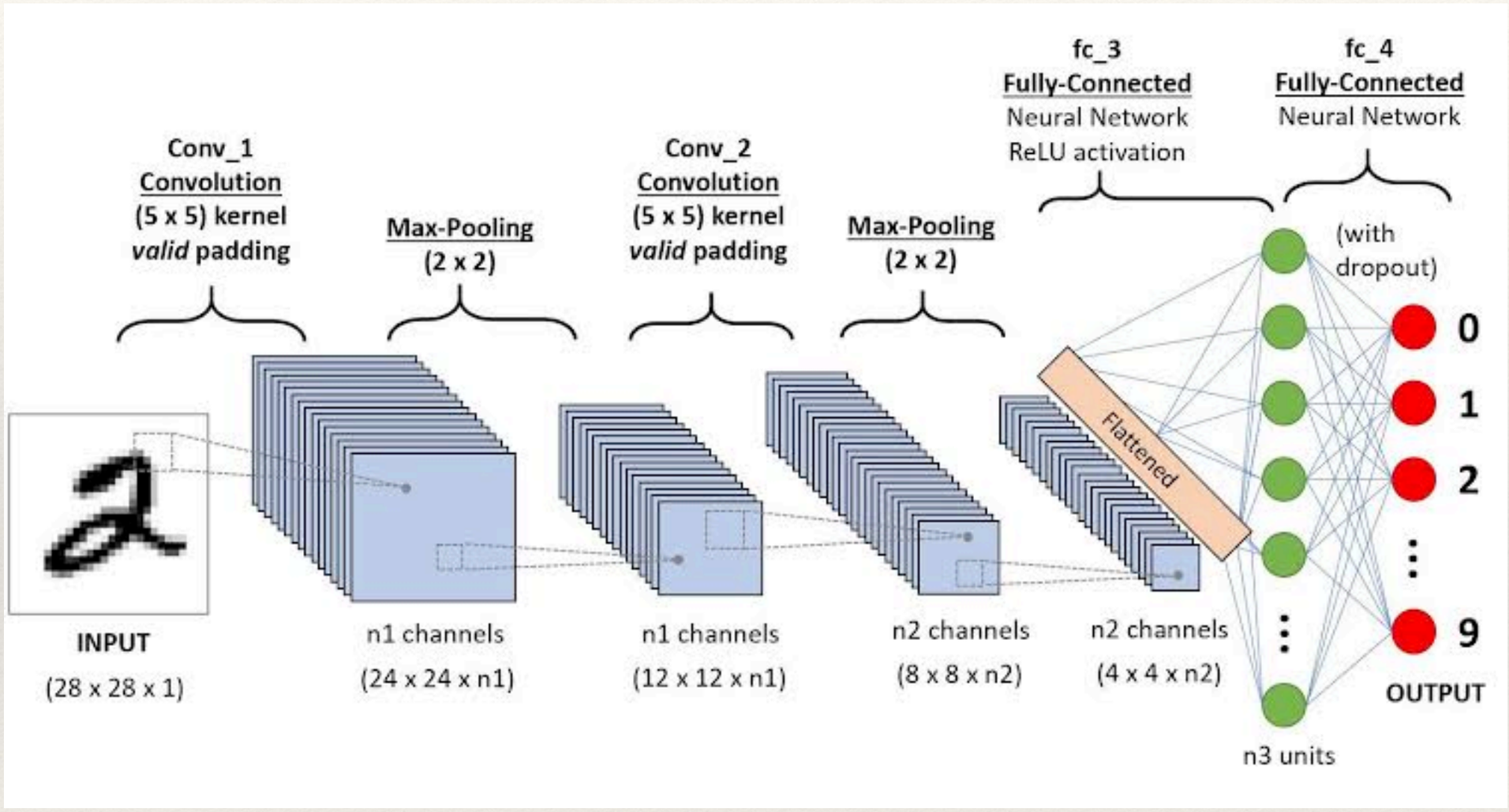


Image processing - Classification, segmentation, captioning, biomedical Image processing applications.