

# AIST4010 Tutorial4

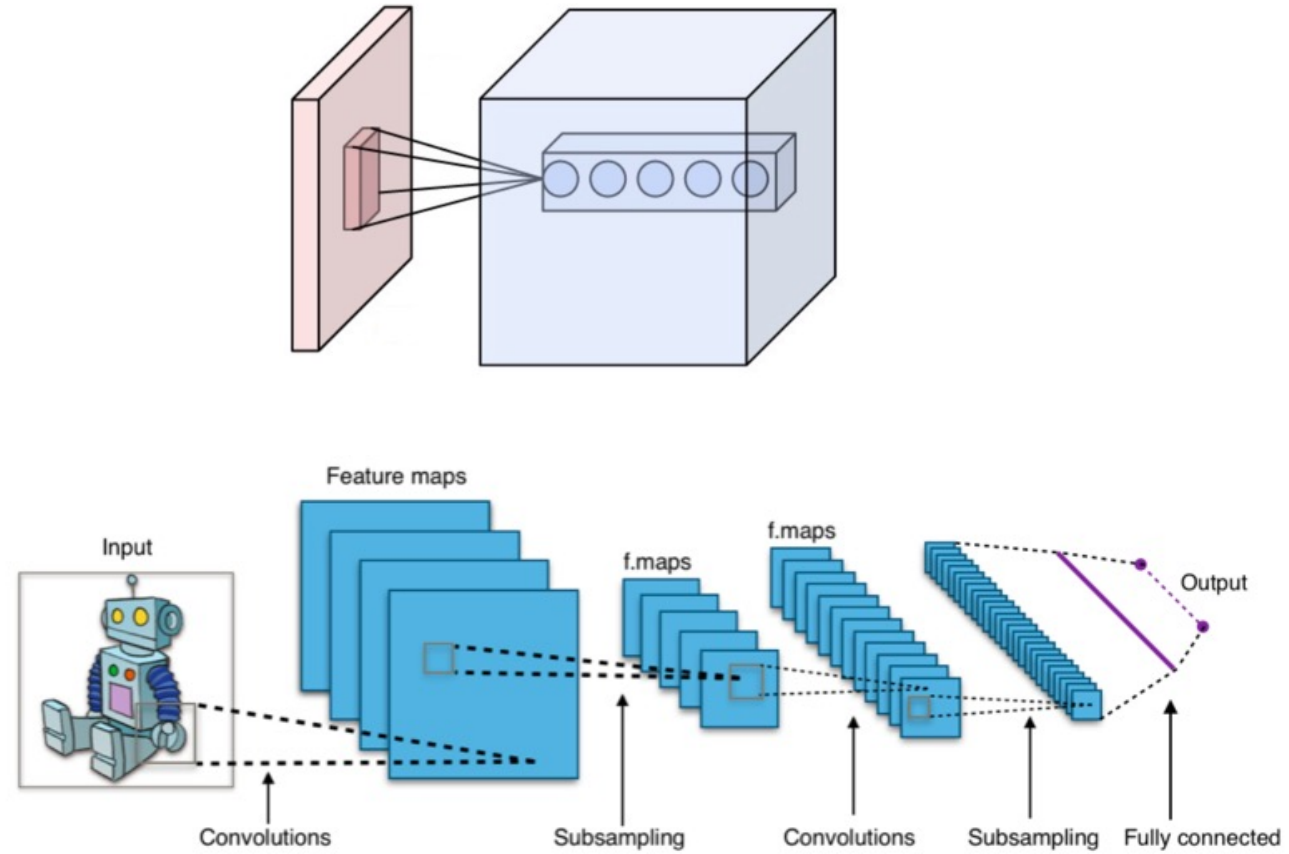
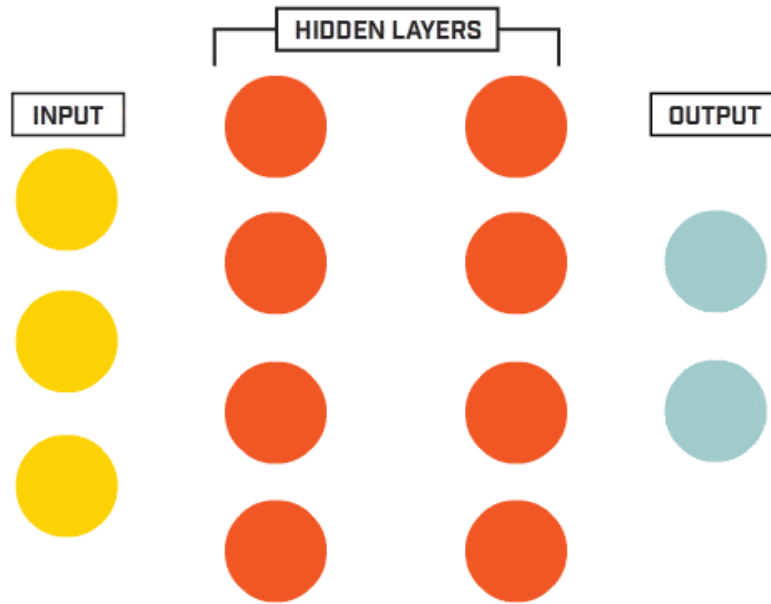
## --from MLP to CNN

Liang Hong

# Outline

- Comparison
- Pure Convolution architecture
- Pure FC architecture

# Architecture



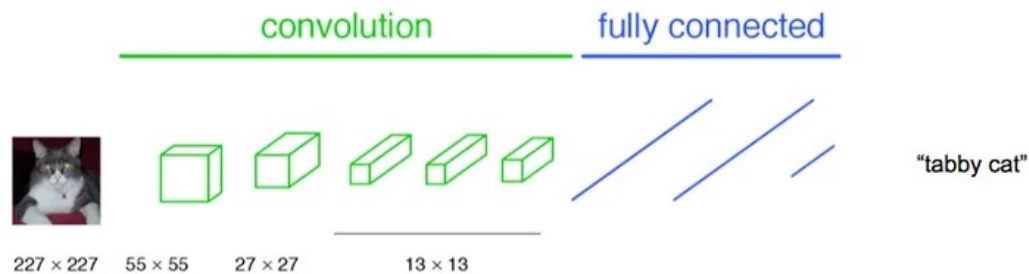
# Similarity

- FC -> Convolution
  - Mask input not within the conv kernel window
  - One node in hidden layer as a result of conv
- Convolution -> FC
  - Window size same as input
  - Line conv result up as hidden layer
- All just linear algebra!

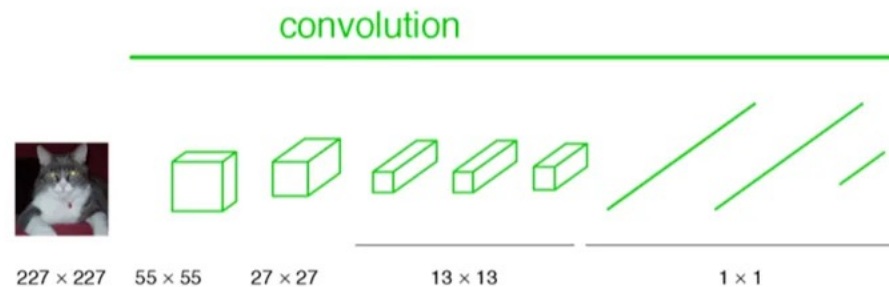
# Pure Convolution architecture

- FCN (fully convolutional network)

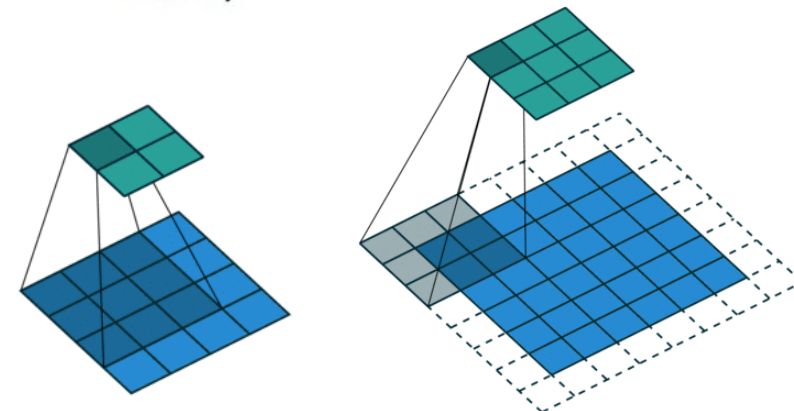
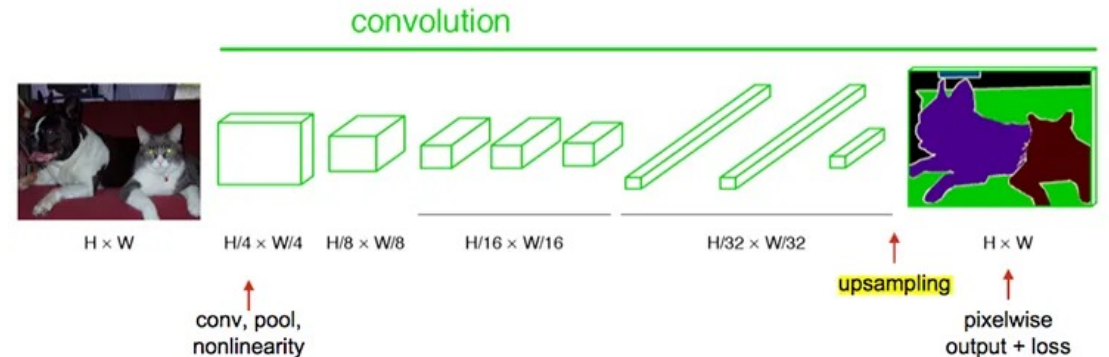
**a classification network**



**becoming fully convolutional**



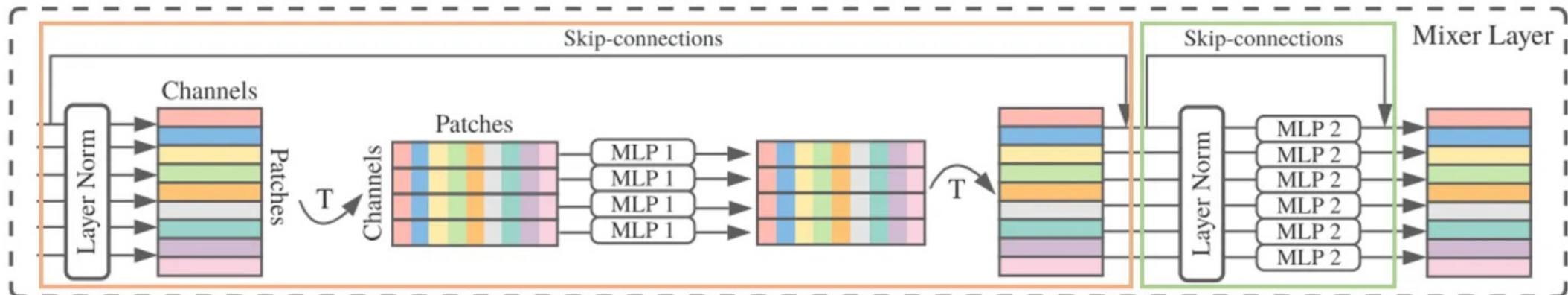
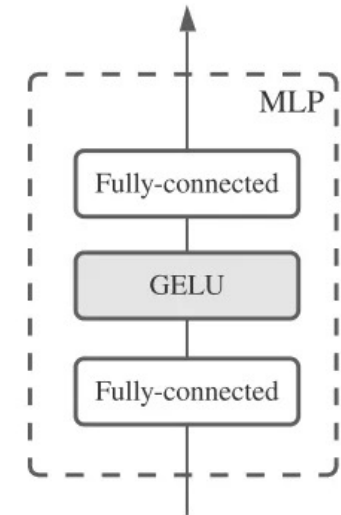
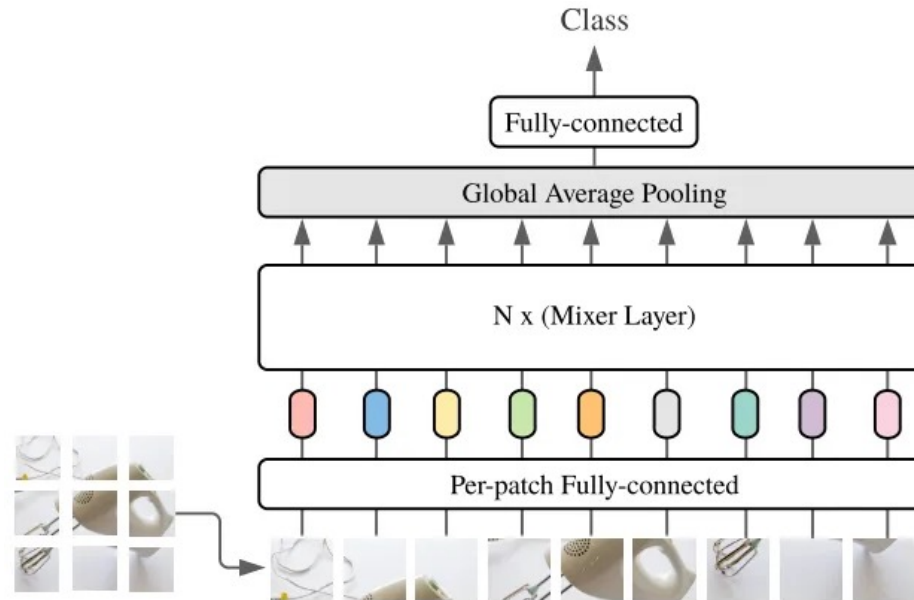
**end-to-end, pixels-to-pixels network**



Deconvolution

# Pure FC architecture

- MLP-Mixer



# How they mix?

- FCN:
  - Linear layer -> convolution
  - Reduce dim with convolution
- MLP-Mixer:
  - MLP patch embedding: 16x16 convolution
  - Token mixer: 16x16 convolution
  - Channel mixer: 1x1 convolution (change dimension)