Convolutional Neural Networks (CNN)

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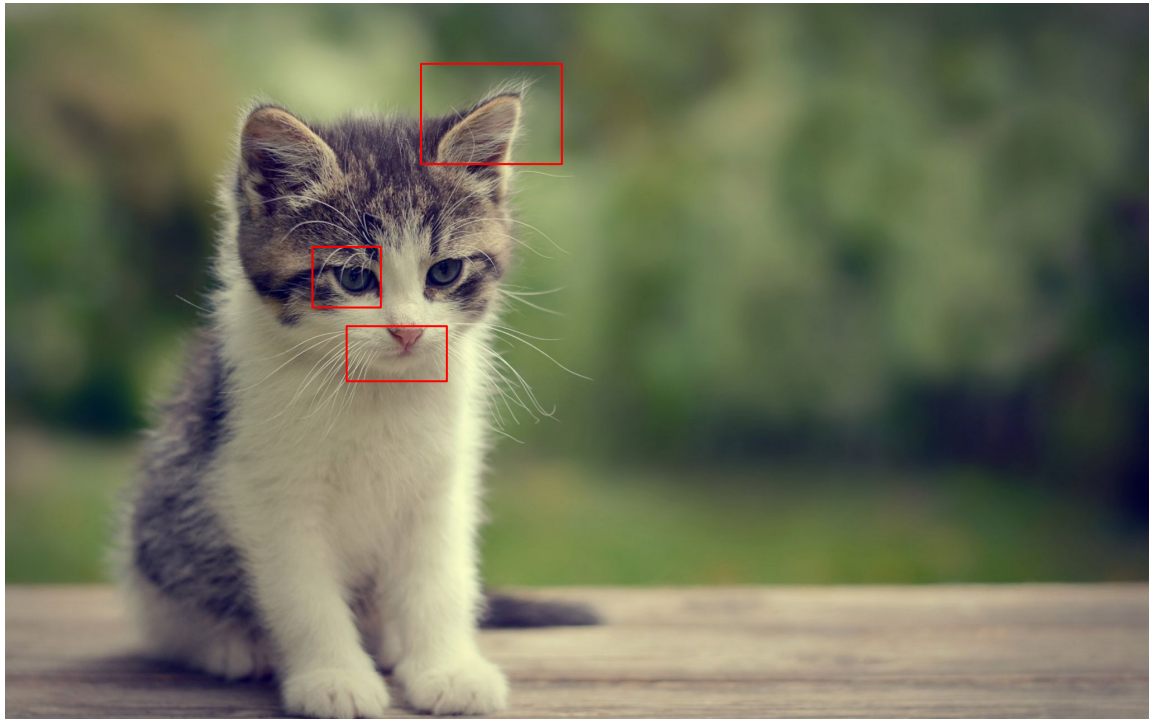
What is CNN ?

- CNN = Convolutional Neural Network
- A model designed to understand images

How Humans Recognize Images



CNN Thinks Like Humans

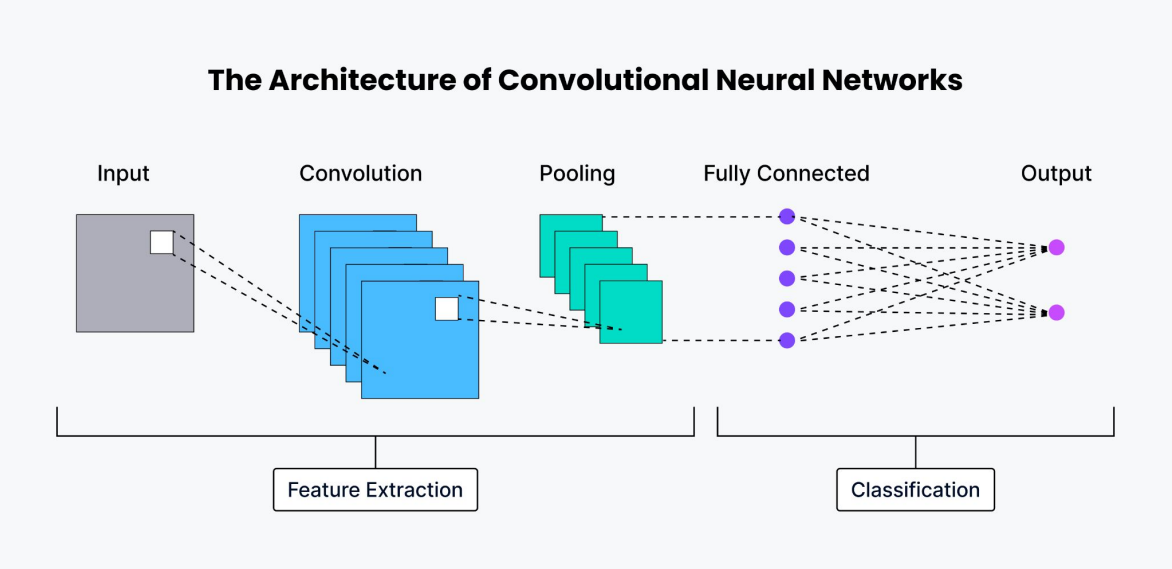
Dog: P= 0.1

Cat: P = 0.9

Why CNN is Powerful

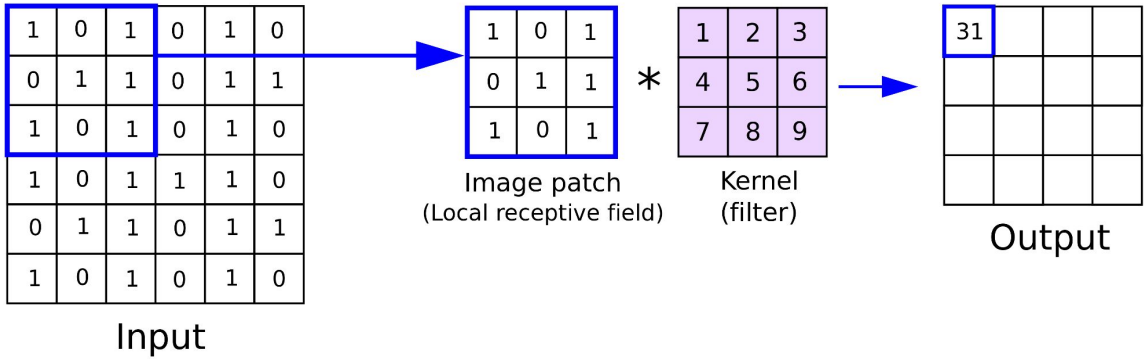
- No manual feature engineering
- Learns features automatically
- From simple → complex representations

CNN Workflow Overview



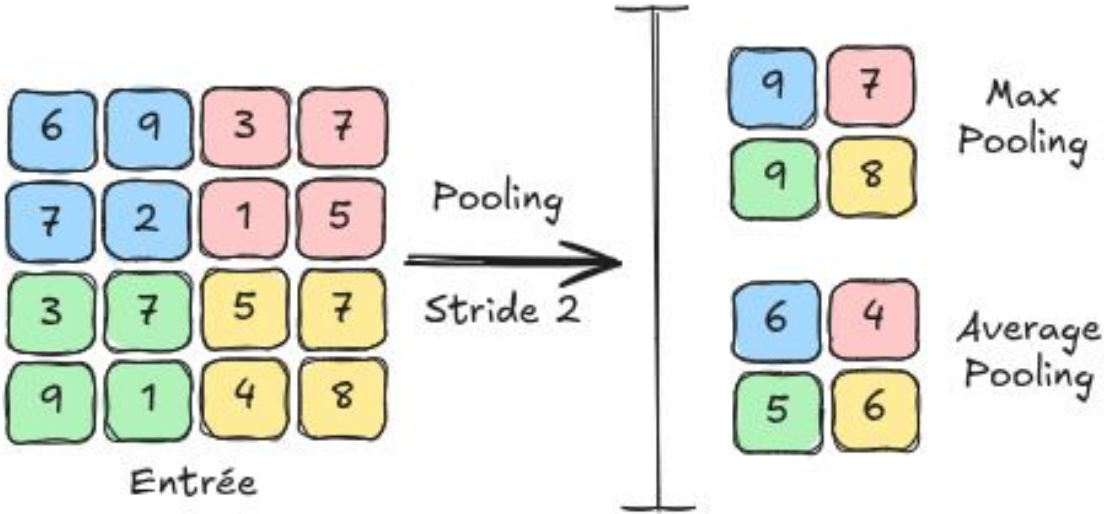
- Input image (pixels)
- Convolution layers
- Pooling layers
- Fully connected layer
- Prediction

Convolution Layer



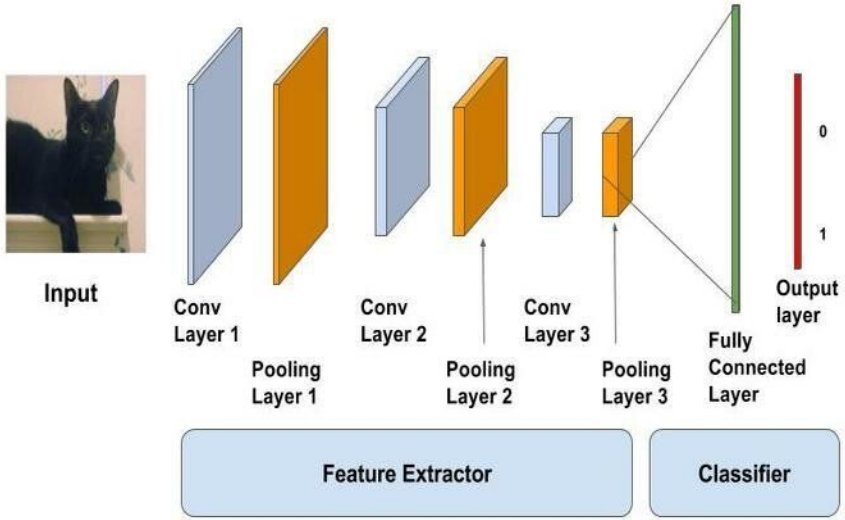
- Small filters slide across the image
- Each filter looks at a local region
- Learns edges, corners, textures

Pooling Layer



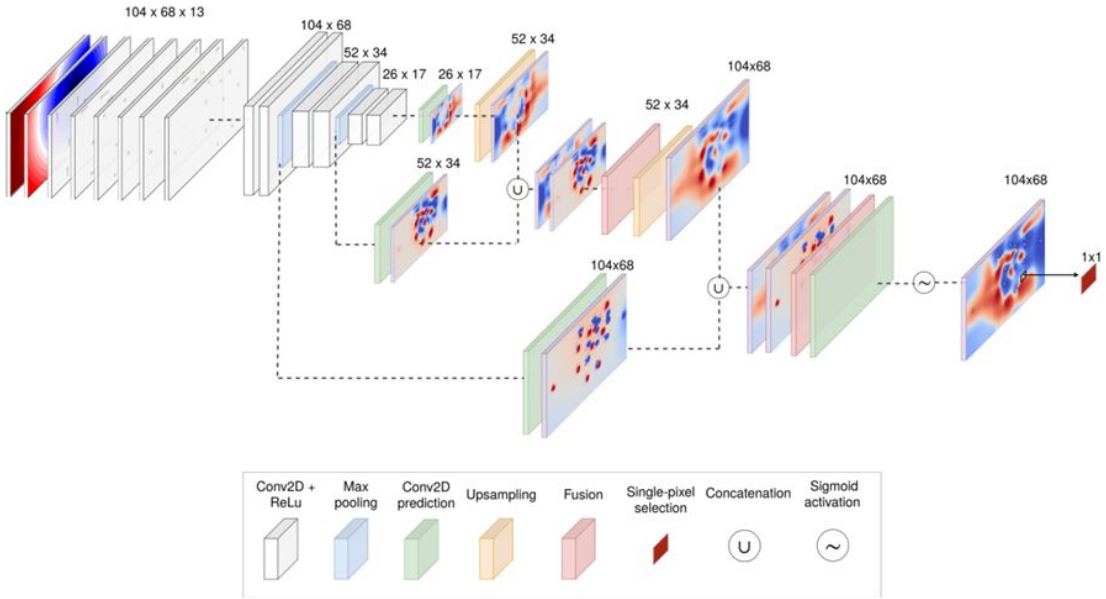
Pooling keeps the most important values.

From Shallow to Deep

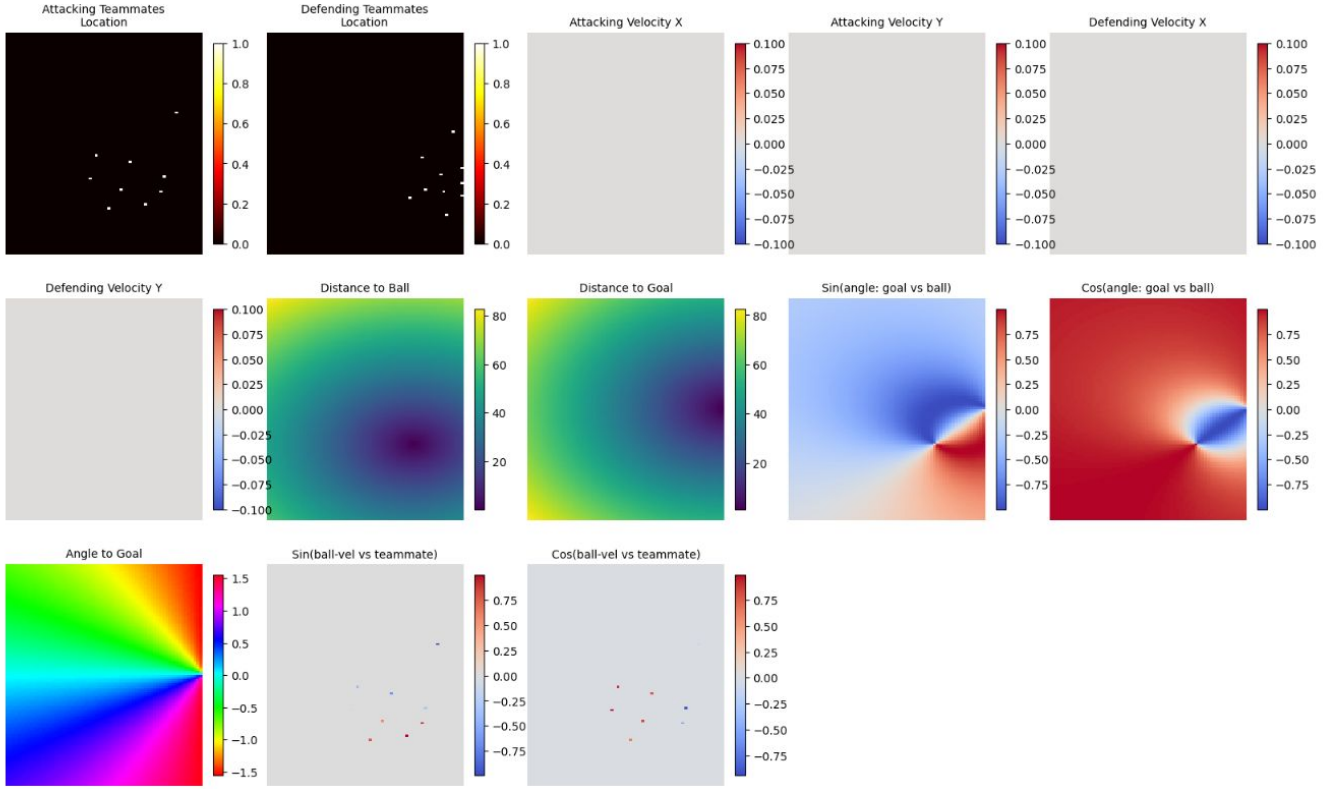


As the network becomes deeper, features become more abstract

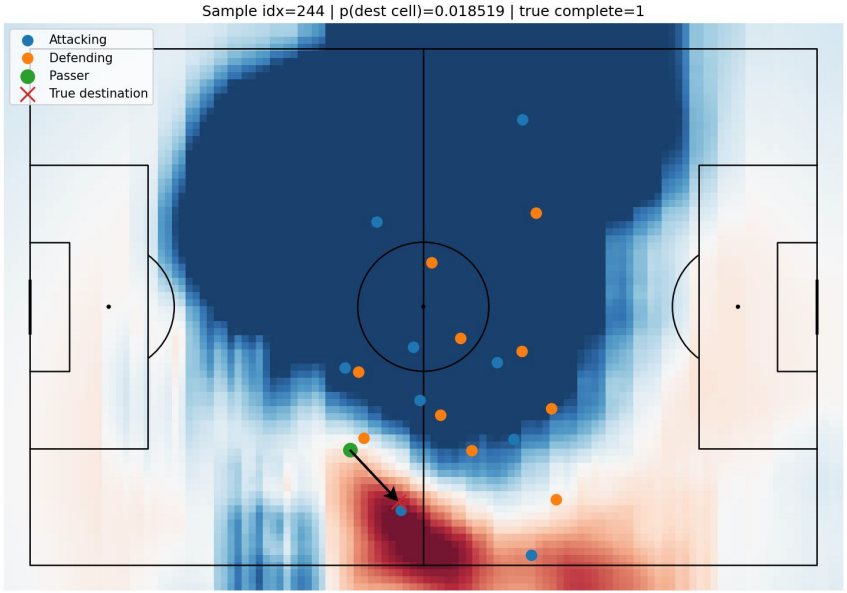
CNN in Our Soccer Project

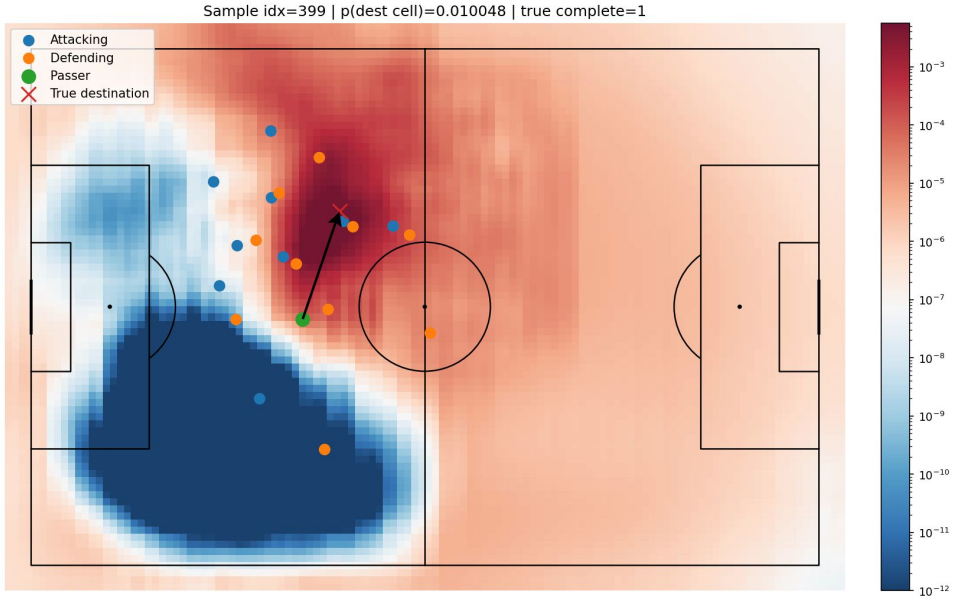


We treat the soccer field like an image



Output





This is not a single decision, but a spatial representation

Questions & Feedback