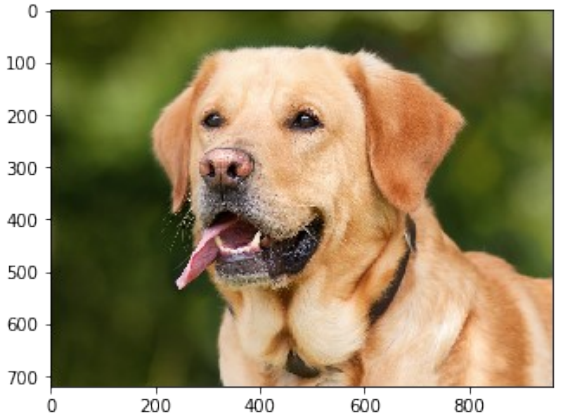
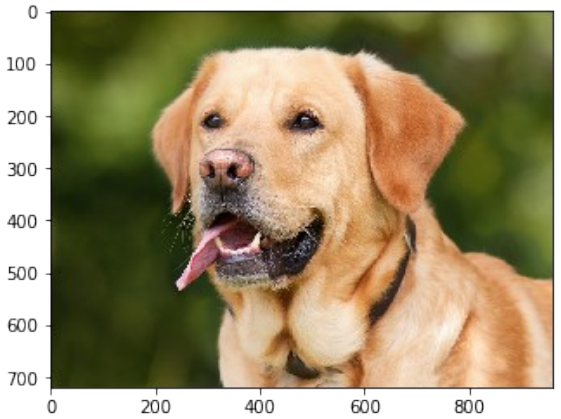
Need for CNN

Identify the Image



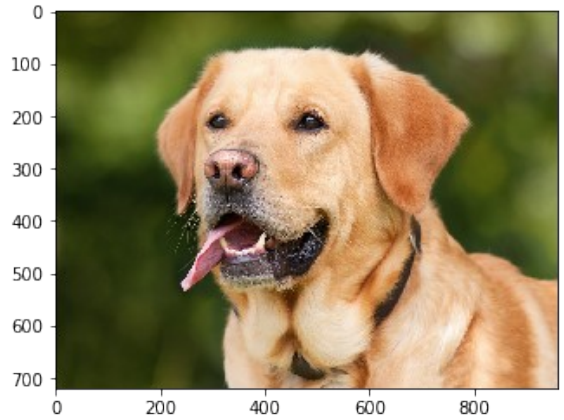
Identify the Image

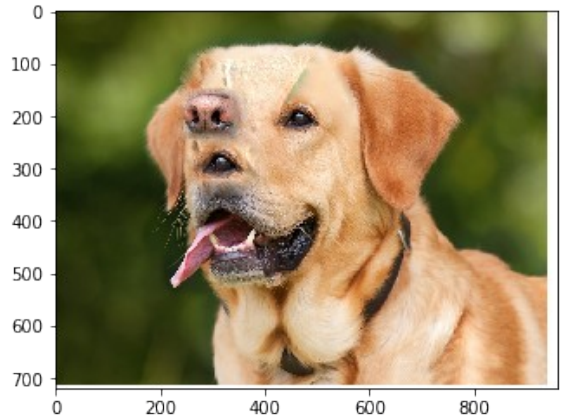
Fully Connected
Neural Networks



CNN

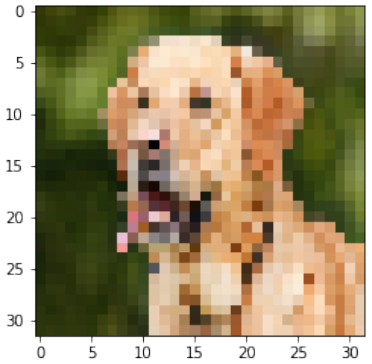
Problem using NN for Images





Loosing spatial
Orientation of Images

Problem with using NN for Images



32 X 32 X 3 = 3072

720 X 960 X3 = 2,073,600

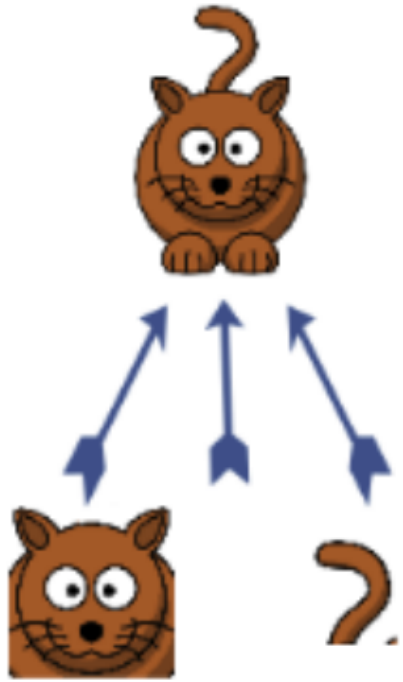
Parameter Explosion in Neural Networks

Enter CNN

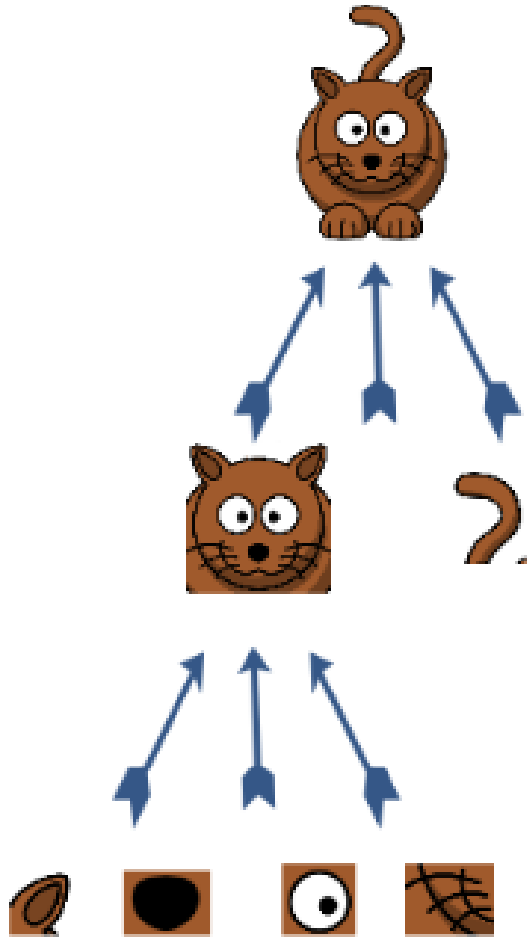
Preserves Spatial Orientation

Reduces learnable Parameters

Example – How do we Identify a CAT as a CAT?



Example – How do we Identify a CAT as a CAT?



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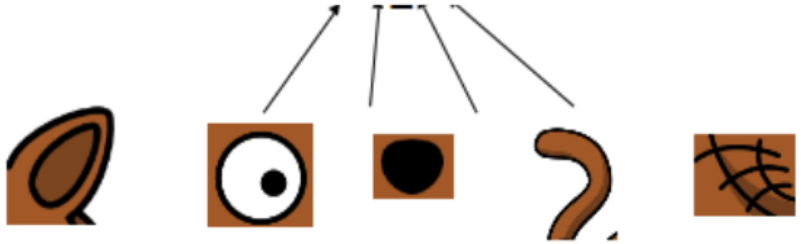
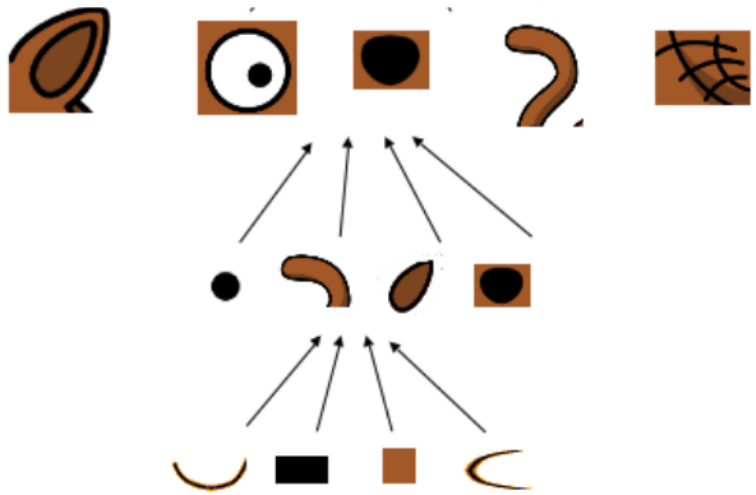


Example – How do we Identify a CAT as a CAT?



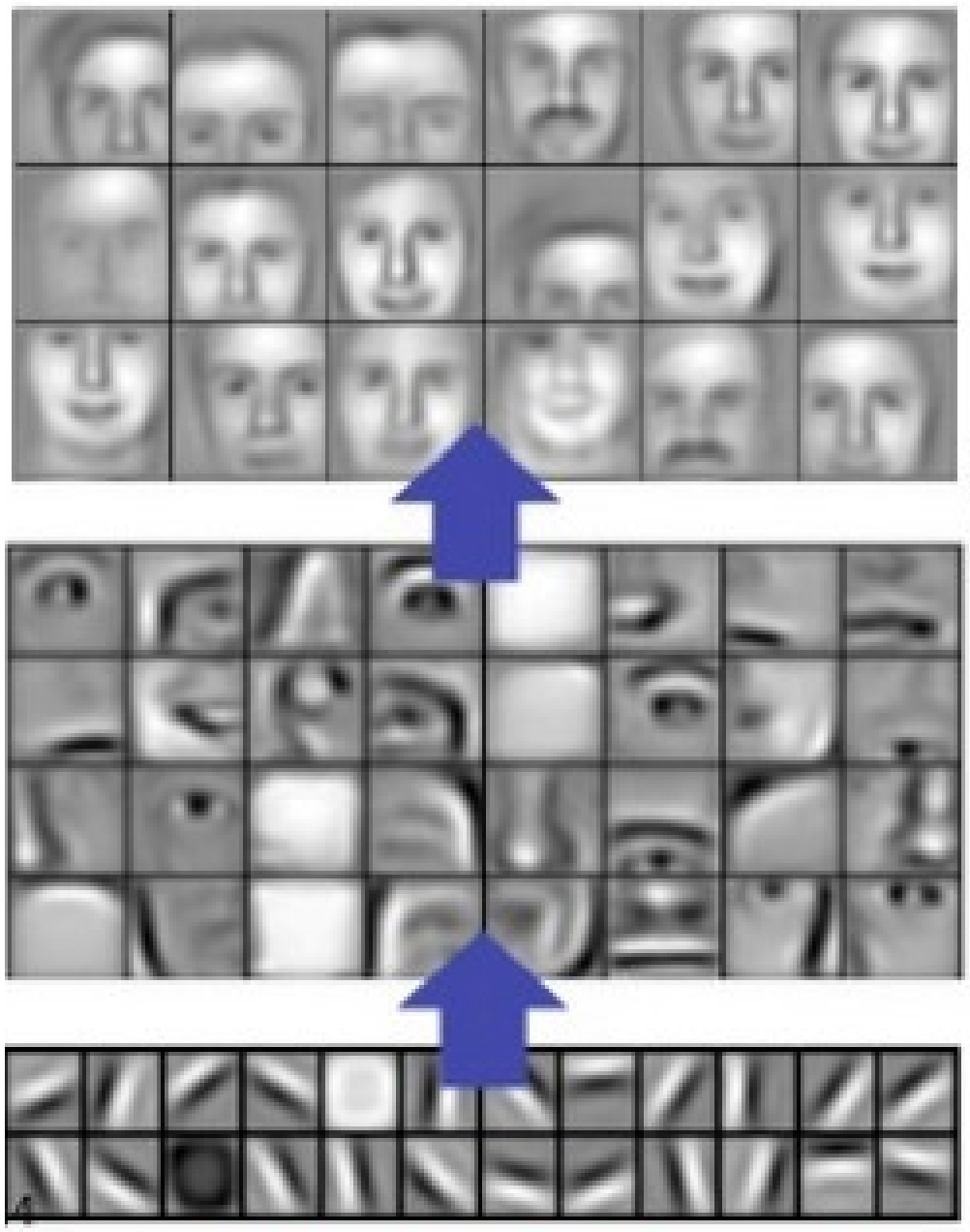


Image features

Shapes

Edges

High Dimensional Features

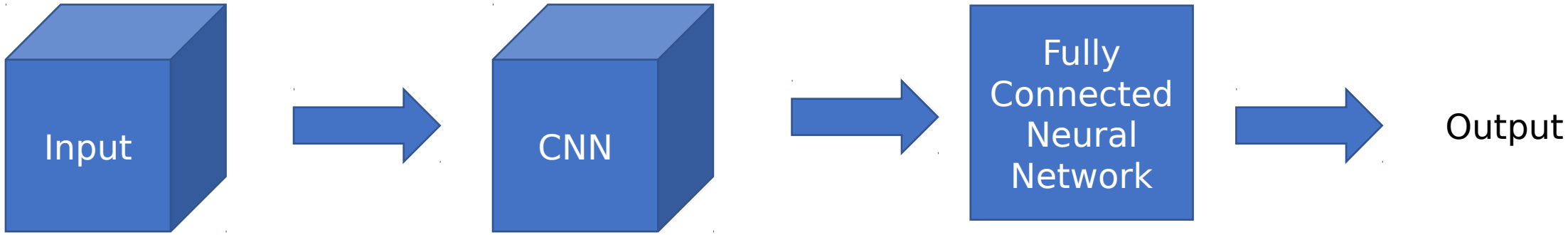
Low Dimensional Features

How CNN does it?

Feature Extraction using Filters

Dimensionality Reduction using Pooling

CNN Structure



Thank You